SRA 2017

RISK ANALYSIS

The Profession · The Practitioners · The Research

FINAL PROGRAM

Crystal Gateway Marriott
Arlington, Virginia, USA
December 10 - 14, 2017

2017 Program Committee


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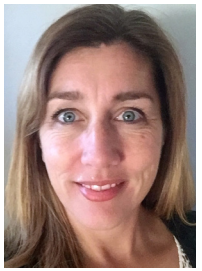
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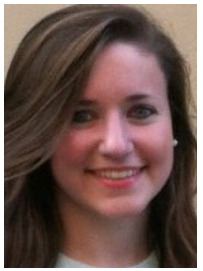
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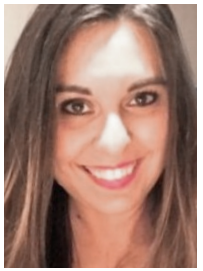
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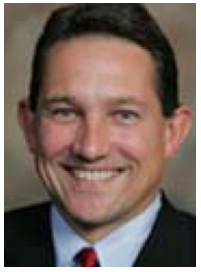
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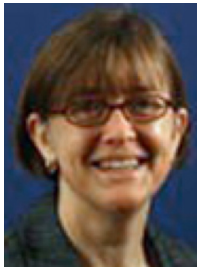
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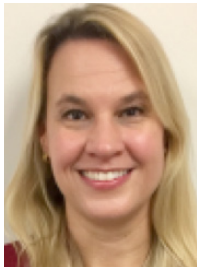
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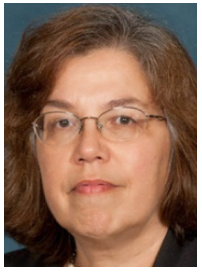
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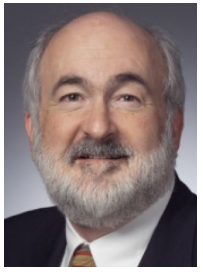
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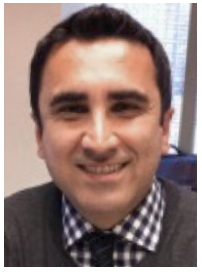
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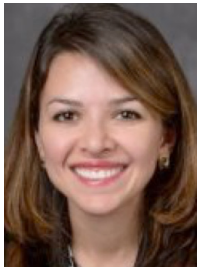
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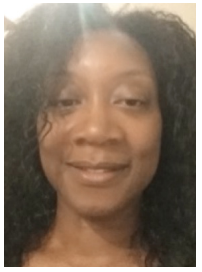
Vanessa Schweizer


Amina Wilkins


Matthew Wood

Society For Risk Analysis Annual Meeting
2017 Final Program

Table of Contents

Looking for WiFi?
Network: Marriott_Conference
Access Code: SRA2017

Meeting Highlights

Meeting Events! All events take place at the Crystal Gateway Marriott, starting with the opening reception on Sunday, December 10, 6:00-7:30 PM (Cash Bar), and continuing to the closing t-shirt giveaway and raffle with a possibility of winning a trip to Norway, December 13, 5:00 PM. The meeting includes three plenary sessions and complimentary box lunch on Monday, Awards Banquet lunch on Tuesday (comes with your registration), and a plenary luncheon on Wednesday (also included in your registration fee). Don't forget workshops on Sunday and Thursday - there is still room!

Meeting Theme – *"Risk Analysis – the Profession, the Practitioners, the Research"* highlights the important role risk analysts have in tackling risk problems and improving the science and practice of risk analysis.

Poster Reception! The meeting will feature a poster reception with food and drinks on Monday evening from 6:00 to 8:00 PM. Poster set-up starts at 4:00 PM, and poster presenters will be at their posters for questions and discussion during the reception. Vote for the best poster awards on the App! Don't miss it!

What is special this year?

- Images of Risk Competition
- A raffle at the t-shirt giveaway on Wednesday at 5:15 PM with a possibility of winning a trip to Norway
- Reflections on who we are as risk analysis professionals and what we do
- More discussions of fundamental issues of risk analysis
- Many roundtables; a special track (Salon B) of roundtables with topics of broad interest (Presidential roundtables)
- A roundtable with representatives of the SRA regional organizations, and a roundtable with representatives from the various Specialty Groups

Plenary session on Monday begins at 8:30 AM so plan to arrive early!

2017 Council

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Amir Mokhtari

Roshi Nateghi

Abani Pradhan

Allison Reilly

Vanessa Schweizer

Amina Wilkins

Matthew Wood

Oral Presenter Ready Room Reminder

See Page 5 for Hours

If you are presenting an oral presentation, don't forget to upload your presentation in the Speaker Ready Room (Arlington Ballroom Office) at least 24 hours prior to your presentation. If you have already uploaded your presentation file, come by the Ready Room to ensure it has been received and uploaded correctly.

Mark your calendar!

Dates for the 2018 - 2020 Annual Meetings:

2018
December 9-12
Marriott New Orleans
New Orleans, Louisiana

2019
December 8-12
Crystal Gateway Marriott
Arlington, Virginia

2020
December 13-17
JW Marriott Austin
Austin, Texas

SRA Worldwide Headquarters

1313 Dolley Madison Boulevard, Suite 402
McLean, Virginia, USA 22101
+1.703.790.1745; FAX: 703.790.2672
www.SRA.org, SRA@BurkInc.com

Crystal Gateway Marriott

1700 Jefferson Davis Hwy, Arlington, VA 22202
Phone: 703.920.3230
www.marriott.com/hotels/fact-sheet/travel/asgw-crystal-gateway-marriott

Conference Events, Committee Meetings

Sunday, December 10

2019 World Congress Program Committee Meeting
9:00 AM–2:00 PM - *Madison*

SRA Council Meeting
Noon–5:00 PM - *Arlington Ballroom Salon 2*

Editorial Staff Meeting
3:30 PM–5:00 PM - *Jefferson*

Editorial Board Meeting
5:00 PM–6:00 PM - *Jefferson*

SRA Welcome Reception
6 :00 PM- 7:30 PM - *Salon III-IV*

Monday, December 11

New Member, Student/Young Professionals Breakfast
7:00 AM-8:00 AM - *Skyview*
All SRA Students, Young Professionals, and 2016 and 2017 New Members (badges with a New Member ribbon) are welcome to attend.

Conferences & Workshops Committee Meeting
7:30 AM-8:30 AM - *Jackson*

Publications Committee Meeting
7:30 AM-8:30 AM - *Lee*

Plenary Session
8:30 AM–10:00 AM - *Salon III-VI*

Specialty Group Meetings
Pick up your box lunch by the SRA registration desk
12:00 PM-1:30 PM - *See page 5*

SRA Fifth World Congress on Risk, Cape Town, 2019
5:00 PM-6:00 PM - *Jackson*

Poster Reception
6:00 PM–8:00 PM - *Salon III-VI*

Tuesday, December 12

Finance Committee Meeting
7:00 AM-8:00 AM - *Lee*

Communications Committee Meeting
7:30 AM-8:30 AM - *Jackson*

Regions Committee Meeting
7:30 AM-8:30 AM - *Madison*

Audit Committee Meeting
8:00 AM-9:00 AM - *Lee*

Plenary Session
8:30 AM–10:00 AM - *Salon III-VI*

SRA Awards Luncheon and Business Meeting
Noon–1:30 PM - *Salon III-VI*

National Capital Area Chapter Mixer
6:00 PM-7:30 PM - *Jefferson*
Come and meet the NCAC officers and learn about our future events.

Specialty Group Mixers
6:00 PM-7:30 PM - *See page 5*

SRA Council Meeting
6:30 PM-10:00 PM - *Arlington Ballroom Salon 5*

Wednesday, December 13

Specialty Group Chair Breakfast
7:00 AM-8:00 AM - *Jefferson*

Education Committee Meeting
7:30 AM-8:30 AM - *Jackson*

SRA Agenda Environment, Systems, Decisions Editorial Board Meeting
7:30 AM-8:30 AM - *Lee*

Plenary Luncheon
Noon-1:30 PM - *Salon III-VI*
Included in registration fee

T-Shirt Giveaway and Raffle Drawing
5:15 PM - 5:45 PM - *Registration Area*

***** Three Lunches Included *****
in your Registration Fees
Monday Box Lunch, Tuesday Awards Banquet, Wednesday Plenary Luncheon
Please see the registration desk if you have dietary restrictions

All Meetings Are Open
All meetings announced in this program are open, everyone is welcome and encouraged to attend.

2017 Specialty Group Award Winners

Applied Risk Management
Patricia Larkin

Decision Analysis and Risk
Sara Goto

Dose-Response
Qiran Chen
Alexandre Chabrelie

Economics and Benefits Analysis
Omer Keskin

Engineering and Infrastructure
Jinzhu Yu

Exposure Assessment
Mahboobeh Teimouri

Foundational Issues in Risk Analysis
Kelli Johnson

Microbial Risk Analysis
Hao Pang
Jiin Jung

Occupational Health and Safety
Aubrey Langeland

Risk and Development
Zoya Banan

Risk Policy & Law
Winifred Ekezie

Security and Defense
Matthew Smith

Student and International Travel Award Winners

Domenico Amodeo
Matthew Baucum
Saikath Bhattacharya
Géraldine Boué
Gerald Braley
Pei-Hsuan Chang
Long Chen
Yeong Ruey Chu
Pamela C. Cisternas
Zachary Collier
Christopher Cummings
Ma. Brida Lea Diola
James Ede
Mustafa Elmontsri
Kieran Findlater
Rosa Maria Flores-Serrano
Patrick Fueta
Emily Garner
Jorge Gonzalez Ortega
Madison Hassler
Ruey-Lin Horng
Huiling Hu
Ming-Che Hu
Yan CHi Huang
Jie Huang
Yu-chieh Huang
Shao Zu Huang
Marlena Keisler
Khadija Khan
Huanhong Li
Xunguo Lin
Vineet Madasseri Payyappalli
Dresden McGregor
Myriam Merad
Saurabh Mishra
Maryam Mohammadabbasi
Alexis Mraz
Vidhyashree Nagaraju
Kenneth Nguyen
Anne-Marie Nicol
Tatyana Novikova
Alette Opperhuizen
Tsuyoshi Oshita
Nelson Pace
Kelsey Poinsatte-Jones
Barbara Rath
Naoki Sato
Naghmeh Sheikh Hassani
Venkateswaran Shekar
Barbara Swiatkowska
Alexa Tanner
Galen Treuer
Bairong Wang
Emily Wells
Catherine Wong
Alexa Wood
Kuen-Yuh Wu
Fanfan Wu
Siyuan Xian
Jingya YAN
Shiyu Yang
Kun Yang
Yun-Ting Yen
Jina Yu
Jinzhu Yu
Hwa-Lung Yu
Xiao Zhang
Wei Zhang
Claire Zoellner

Committee Meetings and Events

Specialty Group Meetings

Monday, December 11 - 12:10-1:25 PM

All specialty group meetings will take place during lunch time. Pick up your box lunch near the registration desk and attend the meeting(s) of your choice.

12:10-12:45 PM

Dose Response (DRSG) - *Salon A*
Economics & Benefits Analysis (EBASG) - *Salon B*
Occupational Health & Safety (OHSSG) - *Salon C*
Risk Communication (RCSG) - *Salon FG*
Security & Defense (SDSG) - *Salon H*
Ecological Risk Assessment (ERASG) - *Salon K*
Foundational Issues in Risk Analysis (FRASG) - *Salon 1*
Risk, Policy & Law (RPLSG) - *Salon 2*

12:50-1:25 PM

Exposure Assessment (EASG) - *Salon A*
Risk & Development (RDSG) - *Salon B*
Applied Risk Management (ARMSG) - *Salon C*
Decision Analysis & Risk (DARSG) - *Salon FG*
Emerging Nanoscale Materials (ENMSG) - *Salon H*
Engineering & Infrastructure (EISG) - *Salon K*
Microbial Risk Analysis (MRASG) - *Salon 1*

Specialty Group Mixers

Tuesday, December 12 - 6:00-7:30 PM

Mixer 1 - DRSG, MRASG, EASG, ARMSG - *Skyview*
Mixer 2 - SDSG, DARSG, EISG, FRASG - *Lee*
Mixer 3 - RCSG, OHSG, ERASG - *Jackson*
Mixer 4 - EBASG, ENMSG, RPLSG, RDSG - *Madison*

Registration Desk Hours

Arlington Ballroom Foyer

Sunday, December 10	4:00 PM - 6:30 PM
Monday, December 11	7:00 AM - 5:00 PM
Tuesday, December 12	8:00 AM - 5:00 PM
Wednesday, December 13	8:00 AM - 5:00 PM

Key to Specialty Group Designations

ARMSG = Applied Risk Management
DARSG = Decision Analysis and Risk
DRSG = Dose-Response
EASG = Exposure Assessment
EBASG = Economics & Benefits Analysis
EISG = Engineering and Infrastructure
ENMSG = Emerging Nanoscale Materials
ERASG - Ecological Risk Assessment
FRASG = Foundational Issues in Risk Analysis
MRASG = Microbial Risk Analysis
OHSSG = Occupational Health & Safety
RCSG = Risk Communication
RDSG = Risk & Development
RPLSG = Risk, Policy and Law
SDSG = Security and Defense

Speaker Ready Hours

Arlington Ballroom Office *(next to Registration Desk)*

Sunday	3:00 PM - 8:00 PM
Monday	7:00 AM – 5:00 PM
Tuesday	7:00 AM - 5:00 PM
Wednesday	7:00 AM - Noon

Exhibitors

EBTC -Evidence-Based Toxicology Collaboration **Booth: 8**

615 N. Wolfe Street, W7032
Baltimore, MD 21205
410-614-4990
www.ebtox.org

EBTC (Evidence-based Toxicology Collaboration at Johns Hopkins Bloomberg School of Public Health) is an international collaboration of science, regulatory, industry and NGO leaders working together to establish, coordinate and facilitate the use of evidence-based toxicology to inform regulatory, environmental and public health decisions.

EPA Office of Research and Development **Booth: 3**

109 T.W. Alexander Drive
Research Triangle Park, NC 27709
919-541-1552
www.epa.gov/research

U.S. Environmental Protection Agency's (EPA) Office of Research and Development (ORD) conducts cutting-edge research that provides the underpinning of science and technology for policies and decisions made by federal, state and other governmental organizations. ORD's six research programs identify the pressing research needs with input from EPA offices and stakeholders. Research is conducted by ORD's 3 labs, 4 centers, and 2 offices located in 14 facilities.

Evidence Partners **Booth: 2**

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Exhibition – Arlington Ballroom Foyer

Monday, December 11 ..... 10:00 AM -3:30 PM
Poster Reception (*Salons III-VI*) ..... 6:00 PM - 8:00 PM
Tuesday, December 12 ..... 9:30 AM - 4:00 PM
Wednesday, December 13 ..... 9:30 AM - 4:00 PM

ICF **Booth: 5**

9300 Lee Highway
Fairfax, VA 22031
703-934-3000
www.icf.com

ICF (NASDAQ:ICFI) is a global consulting services company with over 5,000 specialized experts, but we are not your typical consultants. At ICF, business analysts and policy specialists work together with digital strategists, data scientists and creatives. We combine unmatched industry expertise with cutting-edge engagement capabilities to help organizations solve their most complex challenges. Since 1969, public and private sector clients have worked with ICF to navigate change and shape the future. Learn more at icf.com.

International Society of Exposure Science (ISES) **Booth: 11**

1035 Sterling Road, Suite 202
Herndon, VA 20170
800-869-1551
www.intlexposurescience.org

The International Society of Exposure Science (ISES) promotes and advances exposure science as it relates to the complex inter-relationships between human populations, communities, ecosystems, wildlife, and chemical, biological, and physical agents, and non-chemical stressors. ISES members have diverse expertise and training in biological, physical, environmental, and social sciences, as well as various engineering disciplines. ISES' multidisciplinary expertise and international reach make it the premiere professional society for practitioners associated with all aspects of exposure science.

New to Cambridge in 2017

EJRR

EUROPEAN JOURNAL OF RISK REGULATION

At the Intersection of Global Law, Science and Policy

Editor:
Alberto Alemanno, HEC Paris, France

European Journal of Risk Regulation is an interdisciplinary forum bringing together legal practitioners, academics, risk analysts and policymakers in a dialogue on how risks to individuals' health, safety and the environment are regulated across policy domains globally. The journal's wide scope encourages exploration of public health, safety and environmental aspects of pharmaceuticals, food and other consumer products alongside a wider interpretation of risk, which includes financial regulation, technology-related risks, natural disasters and terrorism.

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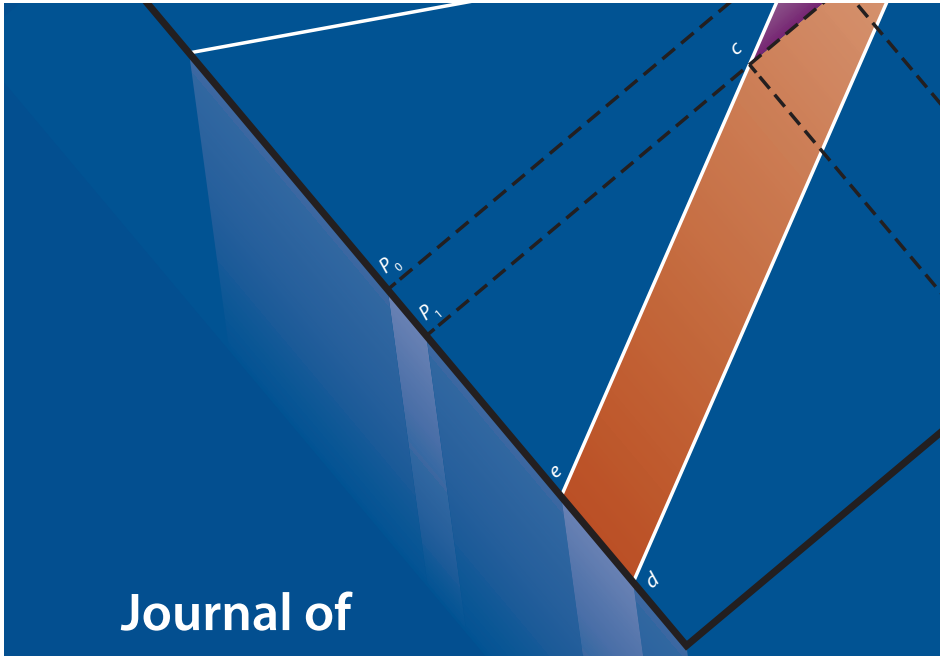

Journal of Benefit-Cost Analysis

Explore the new journal homepage at:
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Society for Benefit-Cost Analysis

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Ramboll Environ **Booth: 1**

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Risk Science Center - University of Cincinnati **Booth: 6**

160 Panzeca Way
Cincinnati, OH 45267
513-558-1908
med.uc.edu/eh/centers/rsc

RSC scientists combine a practitioner's knowledge of the issues involved in human health risk assessment with cutting-edge toxicology expertise to develop state-of-the-science assessments. We provide risk science assessments and peer review, facilitate translation of exploratory results, train students and practicing scientists, and support collaborative efforts to resolve health risk issues.

SETAC **Booth: 10**

229 South Baylen Street, 2nd Floor
Pensacola, FL 32502
850-469-1500
www.setac.org

The Society of Environmental Toxicology and Chemistry is a not-for-profit, global professional organization comprised of some 6,000 members and institutions dedicated to the study, analysis and solution of environmental problems, the management and regulation of natural resources, research and development, and environmental education.

Since 1979, the society has provided a forum where scientists, managers and other professionals exchange information and ideas.

Society for Benefit-Cost Analysis **Booth: 9**

Bronze Sponsor

c/o Evans School of Public Policy and Governance
University of Washington, Box 353055
Parrington Hall, Room 303
Seattle, WA 98195
206-616-4090
benefitcostanalysis.org

The Society for Benefit-Cost Analysis (SBCA) works to improve the theory and practice of benefit-cost analysis and support evidence-based policy decisions. Our members include scholars and practitioners from around the world, from government, academia, nonprofits and private industry. They represent numerous disciplines such as economics, law, engineering, public policy, decision science and natural science.

Springer **Booth: 4**

233 Spring Street
New York, NY 10013
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Resumes and Job Opportunities

The Annual Meeting offers an opportunity to connect jobs with job seekers. Please send your available job postings via email to Jennifer Rosenberg at jrosenberg@BurkInc.com. Job postings and blind resumes are posted at the meeting and will be held at SRA headquarters for six months after the meeting.

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Journal of Benefit-Cost Analysis

Continuing Education Workshops

Workshop #	Workshop Title	Day/Time	Cost
WK1S	Bayesian Benchmark Dose Analysis	Sunday, December 10 8:00 AM-12:00 PM	$200
WK2S	Methods for Quantifying and Valuing Population Health Impacts	Sunday, December 10 8:00 AM-12:00 PM	$275
WK14S	Eliciting Judgments from Experts and Non-experts to Inform Decision-making	Sunday, December 10 8:00am-12:00pm	$250
WK3S	Risk 101 – Understanding Epistemic, Ontological and Aleatory Uncertainty for Risk Profiling	Sunday, December 10 1:00 PM-5:00 PM	$250
WK4S	Use of Risk Assessments – Key Challenges and Recent Advances	Sunday, December 10 1:00 PM-5:00 PM	FREE
WK5S	New Approaches to Risk Analysis in Human Biosecurity	Sunday, December 10 8:30 AM-5:30 PM	$200
WK6S	Categorical Regression Modeling	Sunday, December 10 8:30 AM-5:30 PM	$300
WK7S	Cumulative Risk Assessment: Addressing Combined Environmental Stressors	Sunday, December 10 8:30 AM-5:30 PM	$349
WK8S	Monte Carlo Simulation and Probability Bounds Analysis in R with Hardly Any Data	Sunday, December 10 8:30 AM-5:30 PM	$290
WK10T	Health Risk Assessment of Environmental Chemical Mixtures: Concepts, Methods, Applications	Thursday, December 14 8:00 AM-12:00 PM	$230
WK11T	Probabilistic Dose-Response Assessment: New Guidance from the World Health Organization	Thursday, December 14 8:30 PM-5:30 PM	$300
WK12T	Developing Calibrated Risk Models and Improving Your Risk Intelligence	Thursday, December 14 8:30 AM-5:30 PM	$285
WK13T	Monte Carlo Simulation and Probability Bounds Analysis in R with Hardly Any Data	Thursday, December 14 8:30 AM-5:30 PM	$290

Workshops are offered Sunday and Thursday, either full day, AM half day, or PM half day. Full descriptions of each workshop are provided below

MORNING WORKSHOPS
Sunday, December 10, 8:00 AM-12:00 PM

WK1S: Bayesian Benchmark Dose Analysis

Location: Salon A
Cost: $200

Instructor: *Kan Shao, Indiana University*

This half-day workshop will provide participants with knowledge of benchmark dose (BMD) modeling in a Bayesian framework (including model averaged BMD estimation), hands-on experience on the recently developed web-based Bayesian BMD (BBMD) estimation system and its application to chemical risk assessment. The Bayesian BMD modeling and analysis involves using Markov Chain Monte Carlo (MCMC) algorithm to fit mathematical dose-response models to toxicity data (mainly dichotomous and continuous data) and estimating the distributions of model parameters and quantities of interest (e.g., BMD) by posterior samples. This important feature makes the Bayesian BMD method particularly useful for probabilistic dose-response assessment, which has been strongly advocated by the WHO/IPCS expert panel. Another extremely useful feature of this workshop is the introduction on the model averaging techniques for BMD estimation, which has been suggested as a preferred approach to address model uncertainty in dose-response assessment. In this workshop, participants will not only learn the concepts of model-averaged BMD analysis, but also learn how to use the BBMD system to estimate model-averaged BMD and to incorporate expert judgement in the analysis. Moreover, knowledge and experience from this workshop will certainly better prepare registrants for Dr. Chiu's workshop on WHO/IPCS probabilistic dose-response assessment. Participants should bring their own laptops with recent internet browser installed (the latest version of Google Chrome is preferred).

WK2S: Methods for Quantifying and Valuing Population Health Impacts

Location: Salon B
Cost: $275

Instructors: Kevin Brand, University of Ottawa; Sandra Hoffman, USDA

The workshop reviews standard practices and emerging issues related to the quantification of a population's health state. Particular attention is paid to the array of metrics available for this purpose, their use in quantifying population health impacts, and how these impact projections can be integrated into economic valuations. Risk assessment typically couples exposure information with an exposure-response relationship to estimate changes in incidence rates (e.g., a mortality rate). Expressed in this fashion (along an incident rate scale) these impact measures fall short. They do not capture the burden of disease, are not readily interpretable, complicate the comparison of disease outcomes, and are not suited to a single number summary. This workshop focuses on the methods required to get readily interpretable, comparable, bottom-line, summaries of health impact. A dizzying array of metrics can be used to quantify health impacts. Consider for example "avoidable deaths," PEYLLs, life-expectancy, lifetime risk, HALEs, QALYs, DALEs, DALYs and "attributable-fractions" to name just a few. In this workshop we survey and bring order to these variants, classifying the metrics into a couple of categories. A finer grained classification is provided based on how the metric is calculated; for example does it adjust for the size and age structure of the population under study. The key choices and their influence upon projected outcomes will be outlined. Finally, a survey of the key steps and considerations that are required to map the health impacts, expressed in units such as change in life-expectancy, into health-economic evaluations will be offered.

WK14S: Eliciting Judgments from Experts and Non-experts to Inform Decisionmaking

Location: Salon E
Cost: $250

Instructors: Aylin Sertkaya, Cristina McLaughlin

Decision makers must frequently rely on data or information that is incomplete or inadequate in one way or another. Judgment, often from experts and occasionally from nonexperts, then plays a critical role in the interpretation and characterization of those data as well as in the completion of information gaps. But how experts or non-experts are selected and their judgments elicited matters – they can also strongly influence the opinions obtained and the analysis on which they rely. Several approaches to eliciting judgments have evolved. The workshop will cover topics ranging from recruitment, elicitation protocol design, different elicitation techniques (e.g., individual elicitations, Delphi method, nominal group technique, etc.) to aggregation methods for combining opinions of multiple individuals. The role of judgment elicitation and its limitations, problems, and risks in policy analysis will also be addressed. The workshop will include presentation of two case studies that will include a discussion of the selection process; elicitation protocol development, elicitation technique utilized, and the various issues that arose before, during, and after the elicitation process and the manner in which they were resolved. The class will also include two hands-on exercises where participants will 1) learn about calibration of experts using a mobile application and 2) apply the Delphi and nominal group techniques to examine risk management issues associated with a popular topic.

AFTERNOON WORKSHOPS
Sunday, December 10, 1:00 PM-5:00 PM

WK3S: Risk 101 – Understanding Epistemic, Ontological and Aleatory Uncertainty for Risk Profiling

Location: Salon A
Cost: $250

Instructor: Ronald Der, University of Liverpool

This presentation targets faculty and training personnel examining risk perceptions through multiple views of uncertainty to risk novices. The proposed ½-day workshop presentation/tutorial focuses on understanding the nature of aleatory, epistemic and ontological uncertainty and their impact on continuums of judgment. Judgment is heavily influenced by perception, as such how we prime ourselves to treat with uncertainty & risk requires a clearer understanding of their philosophical underpinnings.

WK4S: Use of Risk Assessments – Key Challenges and Recent Advances

Location: Salon B
Cost: FREE

Instructors: Willy Røed, University of Stavanger, Norway; Roger Flage, University of Stavanger, Norway

The workshop addresses key challenges and recent advances in the use of risk assessments in different industries. It is relevant for delegates familiar with basic risk analysis methods, who would like to enlighten their perspectives on how to plan, execute and use risk assessment to adequately support decision-making. A main topic is how to effectively deal with uncertainties and knowledge in risk assessments. The workshop includes lectures, case study examples, and discussions among the participants.

FULL DAY WORKSHOPS
Sunday, December 10, 8:30 AM-5:30 PM

WK5S: New Approaches to Risk Analysis in Biosecurity

Location: Salon C
Cost: $200

Instructors: Raina MacIntyre UNSW Sydney, Arizona State University; George Poste, Arizona State University; Matthew Scotch, Arizona State University, UNSW Sydney; Tom Engells University of Texas Medical Branch, UNSW Sydney; Mike Lane Emory University; Sally Kane UNSW Sydney.

Dual use research of concern (DURC) is research intended to benefit humankind, but which can also cause harm, either through laboratory accidents or deliberate release. Genetic engineering of pathogens and synthetic genomics (the ability to create synthetic viruses) are examples of DURC. Open access science, biohacking (DIY biology labs) and tools such as CRISPR Cas 9 have accelerated the risk of such technology, and risk-analysis in this area is not yet well developed. There are many similarities to cybersecurity; this area has seen quantum advances in science and technology outpacing our regulatory frameworks and approaches to risk mitigation. Risk analysis of this and other new technologies will be explored in this workshop. We will also cover methods for predictive modeling which can assist in risk analysis and rapid identification of epidemics, as well as tools were differentiating natural and unnatural epidemics. The intersection of cybersecurity and health security will also be covered. The workshop will be a combination of lectures, interactive case studies, group work and discussion, and will lead participants through the relevant background and new approaches to risk analysis. The workshop is brought to you by Global Security PLuS, a new initiative of Arizona State University, UNSW Sydney and Kings College London.

WK6S: Categorical Regression Modeling

Location: Salon D
Cost: $300

Instructors: J. Allen Davis, U.S. EPA; Jeff Gift, U.S. EPA; Jay Zhao; U.S. EPA

The objective of this full-day course is to provide participants with interactive training on the use of the U.S. Environmental Protection Agency's (EPA) Categorical Regression software (CatReg) and its application to risk assessment. Categorical regression modeling involves fitting mathematical models to toxicity data that has been assigned ordinal severity categories (i.e., minimal, mild, or marked effects) and can be associated with up to two explanatory variables corresponding to exposure conditions, usually concentration and duration. CatReg calculates the probabilities of observing the different severity categories over the continuum of the explanatory variables describing exposure conditions. The categorization of observed responses allows the expression of dichotomous, continuous, and descriptive data in terms of response severity and supports the analysis of data from single studies or multiple studies. CatReg can also estimate the lower confidence limit on the dose (the equivalent of a BMDL) associated with a given severity probability and exposure duration. Additionally, the meta-analytical capability of CatReg allows for the filtering of data in order to determine statistically significant different responses between sexes, strains, and/or species. Recently, EPA has released a new graphic-user interface for CatReg that will greatly increase the efficiency with which users can perform categorical regression analyses; this version of the software will be the focus of this training workshop. Participants need to bring their own laptops, with CatReg installed, to the workshop. The latest version of the software program can be found at: www.epa.gov/ncea/catreg. Disclaimer: The views expressed in this abstract are those of the authors and do not necessarily reflect the views or policies of the U.S. EPA.

WK7S: Cumulative Risk Assessment: Addressing Combined Environmental Stressors

Location: Salon FG
Cost: $349

Instructors: Linda K. Teuschler, LK Teuschler & Associates; Rick Hertzberg, Biomathematics Consulting; Margaret MacDonell, Argonne National Laboratory; Moiz Mumtaz, ATSDR; Jane Ellen Simmons, USEPA; Michael Wright, USEPA; Glenn E. Rice, USEPA; Peter McClure, SRC

Cumulative risk assessment (CRA) addresses the impacts of multiple chemical and nonchemical stressors on real world individuals and communities, resulting in complex exposures for individuals and populations with a variety of vulnerabilities, in applications that range from environmental justice and community sustainability to individual health promotion and protection. Nonchemical stressors include biological and physical agents (e.g., microbes and noise) as well as socioeconomic stressors and psychosocial conditions (e.g., associated with natural disasters). Public concerns that can initiate CRAs include (1) elevated environmental measurements or biomonitoring data; (2) multiple sources of pollutants or stressors; and (3) changes in disease rates or patterns (e.g., leukemia cluster) or ecological effects (e.g., loss of wildlife diversity). This workshop focuses on human health and begins with an overview of three CRA elements: analysis, characterization, and quantification (as feasible) of the combined risks from multiple stressors. Teaching methods include lectures and hands-on exercises. Presentations highlight basic concepts, methods, and resources for conducting a population- based CRA. A central theme is integrating exposure and dose-response information with population characteristics during planning and scoping based on initiating factors. Vulnerability factors are addressed, e.g., diet/nutritional

status, behaviors, genetic traits, socioeconomic status, sensitivities, and psychosocial stress. Methods for estimating human health risks are discussed and applied, including epidemiologic approaches and assessing the joint toxicity of chemical mixtures. In the exercises, participants develop chemical, biological and physical stressor groups using exposure and toxicity factors, link them with population vulnerability factors and conduct a risk characterization. Participants are asked to bring a calculator.

WK8S: Monte Carlo Simulation and Probability Bounds Analysis in R with Hardly Any Data

Location: Salon H
Cost: $290

Instructor: Scott Ferson, Applied Biomathematics

This revamped full-day workshop features hands-on examples worked in R on your own laptop, from raw data to final decision. The workshop introduces and compares Monte Carlo simulation and probability bounds analysis for developing probabilistic risk analyses when little or no empirical data are available. You can use your laptop to work the examples, or just follow along if you prefer. The examples illustrate the basic problems risk analysts face: not having much data to estimate inputs, not knowing the distribution shapes, not knowing their correlations, and not even being sure about the model form. Monte Carlo models will be parameterized using the method of matching moments and other common strategies. Probability bounds will be developed from both large and small data sets, from data with non-negligible measurement uncertainty, and from published summaries that lack data altogether. The workshop explains how to avoid common pitfalls in risk analyses, including the multiple instantiation problem, unjustified independence assumptions, repeated variable problem, and what to do when there's little or no data. The numerical examples will be developed into fully probabilistic estimates useful for quantitative decisions and other risk-informed planning. Emphasis will be placed on the interpretation of results and on how defensible decisions can be made even when little information is available. The presentation style will be casual and interactive. Participants will receive handouts of the slides and a CD with software and data sets for the examples.

MORNING WORKSHOP
Thursday, December 14, 8:00 AM-12:00 PM

WK10T: Health Risk Assessment of Environmental Chemical Mixtures: Concepts, Methods, Applications

Location: Jefferson
Cost: $230

Instructors: Glenn E. Rice, USEPA; Linda K. Teuschler, LK Teuschler & Associates; Rick Hertzberg, Biomathematics Consulting; Moiz Mumtaz, ATSDR; Jeff Swartout, USEPA

This problems-based, half-day, introductory workshop focuses on methods to assess health risks posed by exposures to chemical mixtures in the environment. Chemical mixtures health risk assessment methods continue to be developed and evolve to address concerns over health risks from multichemical exposures. This workshop presents key concepts and terminology used in chemical mixtures risk assessment and discusses component methods that utilize assumptions of response addition and dose addition, including the following dose-additive methods: the hazard index, interaction-based hazard index, relative potency factors, and toxicity equivalence factors. Integrated additivity methods also will be described. The risk assessment examples developed in the workshop are adapted from real-world mixture analyses, e.g., waste site contaminants, pesticide applications, and drinking water disinfection by-product exposures. The "hands-on" exercises demonstrating the methods are an essential part of this workshop. Discussions include real world examples, exercise results, and answers to general questions. (We ask participants to bring a calculator or laptop). The views expressed in this abstract are those of the authors and do not necessarily reflect the views or policies of the USEPA.

FULL DAY WORKSHOPS
Thursday, December 14, 8:30 AM-5:30 PM

WK11T: Probabilistic Dose-Response Assessment: New Guidance from the World Health Organization

Location: Jackson
Cost: $300

Instructors: Weihsueh Chiu, Texas A&M University; Greg Paoli, Risk Sciences International

WHO/IPCS recently published a guidance document on evaluating uncertainties in human health dose-response assessment. Rather than single values for the point of departure (POD) and for any adjustment/uncertainty factors, the WHO/IPCS approach uses uncertainty distributions that reflect the assumed or estimated uncertainties in each of those aspects. Additionally, it quantitatively defines the protection goals in terms of incidence (I) and magnitude (M) of the critical effect in the human population. By contrast, traditional approaches for developing dose-response toxicity values result in a single value (e.g., RfD, ADI) whose uncertainty is not known and for which the associated values for I and M are not quantified. By quantifying the overall uncertainties in the target human dose at explicitly specified values of I and M, the probabilistic approach developed by the WHO/IPCS expert group allows risk managers to better weigh the benefits from reduced human health effects associated with different risk management options against other considerations, including economic costs. Further, the probabilistic analyses can inform the value of information associated with different options for developing a higher tier assessment. This hands-on training Workshop is aimed at both risk professionals interested in applying the latest approaches to dose-response assessment, as well as students and researchers interested in developing new methods for dose-response. The Workshop will include an overview of the WHO/IPCS approach, case study exercises developing probabilistic dose-response toxicity values using an Excel spreadsheet tool, and a discussion of broader applications of the approach, including economic benefit-cost analyses. A laptop with Microsoft Excel is required.

WK12T: Developing Calibrated Risk Models and Improving Your Risk Intelligence

Location: Madison
Cost: $285

Instructor: Kenneth Crowther, MITRE

Our modern era is increasingly doing more complex work to support decisions, policy, security, infrastructure protection, emergency management, and so forth. We are developing methods and building tools on foundational understanding of probabilities, consequence modeling, and risk. But, how good is our understanding of unavoidable biases in probabilities, common numerical flaws in conceiving consequences, our ability to isolate risk understanding from risk taking behaviors. The unfortunate answer is that we do not know. Fortunately, methods for calibration have been emerging and being popularized over the last two decades from scholars like Phillip Tetlock, Roger Cooke, Doug Hubbard, Ilan Yaniv, Dylan Evans, and others. These techniques require one to seek after objectively verifiable outcomes, but in return enable an individual or an organization to track their ability to understand the uncertain world and the effectiveness of judgments in response to uncertainty.

This course focuses on developing intuition and understanding of subjective probabilities, what they are, how they can be effectively elicited, calibrated, and how to overcome standards estimation biases. The result is that we will lay a strong foundation for quantitative risk analysis that is simple to deploy, comprehensible for even the relatively innumerate (i.e., those who do not like to deal in numbers), and agile for continuous tracking and improving estimates of probability and risk over time.

WK13T: Monte Carlo Simulation and Probability Bounds Analysis in R with Hardly Any Data

Location: Lee
Cost: $290

Instructor: Scott Ferson, Applied Biomathematics

This revamped full-day workshop features hands-on examples worked in R on your own laptop, from raw data to final decision. The workshop introduces and compares Monte Carlo simulation and probability bounds analysis for developing probabilistic risk analyses when little or no empirical data are available. You can use your laptop to work the examples, or just follow along if you prefer. The examples illustrate the basic problems risk analysts face: not having much data to estimate inputs, not knowing the distribution shapes, not knowing their correlations, and not even being sure about the model form. Monte Carlo models will be parameterized using the method of matching moments and other common strategies. Probability bounds will be developed from both large and small data sets, from data with non-negligible measurement uncertainty, and from published summaries that lack data altogether. The workshop explains how to avoid common pitfalls in risk analyses, including the multiple instantiation problem, unjustified independence assumptions, repeated variable problem, and what to do when there's little or no data. The numerical examples will be developed into fully probabilistic estimates useful for quantitative decisions and other risk-informed planning. Emphasis will be placed on the interpretation of results and on how defensible decisions can be made even when little information is available. The presentation style will be casual and interactive. Participants will receive handouts of the slides and a CD with software and data sets for the examples.

7:00 AM-8:00 AM **New Member, Students/Young Professionals Breakfast**, Skyview

8:30 AM-10:10 AM **Plenary Session**, Salons III-VI
Welcome to the 2017 SRA Annual Meeting: Terje Aven
Panel discussion, Risk Analysis: An Obsolete Profession?
Participants: Terje Aven, Michael Dourson, Seth Guikema, Ragnar Löfstedt, Kimberly Thompson, Pamela Williams

10:10 AM-10:30 AM **Coffee Break**, Arlington Ballroom Foyer

	Salon A	Salon B	Salon C	Salon D	Salon E
10:30 AM-Noon	M2-A Roundtable: Risk and Economic Analysis for Development	M2-B Roundtable: Risk Analysis Around the World: Activities in the SRA Regions	M2-C Decision Analysis for Flood Risk and Climate Change	M2-D Symposium: Continuous Quality Improvement: An Alternative to Standards Setting?	M2-E Roundtable: National Academies Decadal Survey of Social and Behavioral Sciences for National Security
Noon-1:30 PM	Pick up your box lunch near the registration desk and attend the specialty group meeting(s) of your choice. **See page 5 for details.** 12:10 PM-12:45 PM - Dose Response (DRSG), Economics & Benefits Analysis (EBASG), Occupational Health & Safety (OHSG), Risk Communication (RCSG), Security & Defense (SDSG), Ecological Risk Assessment (ERASG), Foundational Issues in Risk Analysis (FRASG), Risk, Policy & Law (RPLSG) 12:50 PM-1:25 PM - Exposure Assessment (EASG), Risk & Development (RDSG), Applied Risk Management (ARMSG), Decision Analysis & Risk (DARSG), Emerging Nanoscale Materials (ENMSG), Engineering & Infrastructure (EISG), Microbial Risk Analysis (MRASG)				
1:30 PM-3:00 PM	M3-A Symposium: Modeling the Economic Aspects of Climate Change: A Critical Review of the State of the Science	M3-B Roundtable: Foundations of Safety Science - Perspectives Across Risk, Safety and Resilience	M3-C Health Risk & Decision Analysis	M3-D Symposium: Commercializing Nanoscale Materials: Occupational Safety and Health through Risk Assessment and Risk Management	M3-E Symposium: Game Theory, Decision Analysis for Homeland Security and Disaster Management

3:00 PM-3:30 PM **Coffee Break**, Arlington Ballroom Foyer

3:30 PM - 5:00 PM	M4-A Benefits, Costs and Risks for Health Environment	M4-B Roundtable: SRA Specialty Groups: The Profession, The Practitioners, The Research	M4-C Symposium: The Practice and Research of Resilience	M4-D Symposium: Global Catastrophic Risk Assessment, Policy and Communication	M4-E Symposium: SETAC and SRA Joint Symposium on Bridging Human and Ecological Risk Assessment

6:00 PM-8:00 PM **Poster Reception**, Salons III-VI

7:00 AM-8:00 AM **New Member, Students/Young Professionals Breakfast**, Skyview

8:30 AM-10:10 AM **Plenary Session**, Salons III-VI
Welcome to the 2017 SRA Annual Meeting: Terje Aven
Panel discussion, Risk Analysis: An Obsolete Profession?
Participants: Terje Aven, Michael Dourson, Seth Guikema, Ragnar Löfstedt, Kimberly Thompson, Pamela Williams

10:10 AM-10:30 AM **Coffee Break**, Arlington Ballroom Foyer

	Salon FG	Salon H	Salon J	Salon K	Salon 1	Salon 2
10:30 AM-Noon	M2-F Water Water Everywhere	M2-G Symposium: Cultural Property Risk Analysis	M2-H Listeria in the Food Supply Chain: Incidence and Control Measures	M2-I Symposium: Application of Systematic Reviews in Risk Assessment: Case Studies, Successes and Challenges from Different Domains	M2-J Poster Platform: Interdisciplinary Risk Communication about Food and the Environment	M2-K Risk Communication in Public Health and Medical Contexts
Noon-1:30 PM	Pick up your box lunch near the registration desk and attend the specialty group meeting(s) of your choice. **See page 5 for details.** 12:10 PM-12:45 PM - Dose Response (DRSG), Economics & Benefits Analysis (EBASG), Occupational Health & Safety (OHSG), Risk Communication (RCSG), Security & Defense (SDSG), Ecological Risk Assessment (ERASG), Foundational Issues in Risk Analysis (FRASG), Risk, Policy & Law (RPLSG) 12:50 PM-1:25 PM - Exposure Assessment (EASG), Risk & Development (RDSG), Applied Risk Management (ARMSG), Decision Analysis & Risk (DARSG), Emerging Nanoscale Materials (ENMSG), Engineering & Infrastructure (EISG), Microbial Risk Analysis (MRASG)					
1:30 PM-3:00 PM	M3-F Symposium: The Interface Between Infrastructure and Societal Resilience	M3-G Applied Risk Management: Disruptive Technologies, AI and Cyber	M3-H Evaluating the Impact of Risk Factors and Control Measures: From Drinking Water to Produce and Nuts	M3-I Symposium: From Sensors to Risk Decisions: How Can We Use Sensor and Personal Monitoring Data to Better Inform our Risk Assessment and Regulatory Decisions?	M3-J Roundtable: Applications of Automation, Computational, and Informatic Tools to Operationalize Human Health Risk Assessments at EPA	M3-K All About Energy

3:00 PM-3:30 PM **Coffee Break**, Arlington Ballroom Foyer

3:30 PM - 5:00 PM	M4-F Infrastructure Resilience	M4-G Symposium: Foundational Issues in Risk Analysis I	M4-H Applied Risk Management: Managing Four Completely Different Risks: Mutagenic, Imparities, Civil Aviation, Radon and Water Supply	M4-I Symposium: Opportunistic Pathogens in Premise Plumbing	M4-J Poster Platform: Applications of Automation, Computational, and Informatic Tools to Operationalize Human Health Risk Assessments at EPA – the Genius Studio	M4-K Climate Change Communication I

6:00 PM-8:00 PM **Poster Reception**, Salons III-VI

8:30 AM-10:00 AM **Plenary Session**, Salons III-VI
Evidence and Knowledge-Based Decision-Making in a Risk Analysis Setting: Desired Reality or Misconception?
Participants: Joe Árvai, Terje Aven, Nancy Beck, Frederic Bouder, Sally M. Kane, Lisa A. Robinson

10:00 AM-10:30 AM **Coffee Break**

	Salon A	Salon B	Salon C	Salon D	Salon E
10:30 AM-Noon	T2-A Roundtable: Principles, Methods, and Standards for Benefit-Cost Analysis in Low- and Middle-Income Countries	T2-B Roundtable: Communicating about Risk: Why Doesn't Scientific Evidence Convince People and Political Leaders?	T2-C Symposium: Perspectives on Synthetic Biology	T2-D Symposium: Using Risk Analysis to Address the Needs of Migrants and the Challenges of Migration: Is it Happening?	T2-E Defense and Policy

Noon-1:30 PM **SRA Awards Luncheon and Business Meeting**, Salons III-VI *(Included in registration fee)*
Includes all SRA Awards, 5 Best Poster Award Winners from Monday's Poster Reception, and Images of Risk Competition Winners

1:30 PM-3:00 PM	T3-A Symposium: New Perspectives on the Energy Paradox	T3-B Roundtable: Scientific and Public Understanding of Risk: The Role of Social Sciences	T3-C Symposium: Advances in Probability Assessment for Risk Analysis	T3-D Cumulative Risk Assessment	T3-E Symposium: Conflict Scenarios and Global Catastrophic Risks

3:00 PM-3:30 PM **Coffee Break**, Arlington Ballroom Foyer

3:30 PM-5:00 PM	T4-A Benefit-Cost Analysis of Complex Systems	T4-B Roundtable: Developing Guidelines for Each Domain of Risk Management Practice	T4-C Symposium: GIS-Aided Decision Tools for Managing Environmental Risks and Disasters	T4-D Symposium: DOD Efforts to Advance Risk Assessment of Nanomaterials	T4-E Government Investment & Finance Strategies for Risk Management
5:15 PM - 6:00 PM	T5-A Roundtable: Openness in Risk Analysis: Data, Software and Reproducibility				

6:00 PM-7:30 PM **Specialty Group Mixers** (see page 5 for details)

8:30 AM-10:00 AM **Plenary Session**, Salons III-VI
Evidence and Knowledge-Based Decision-Making in a Risk Analysis Setting: Desired Reality or Misconception?
Participants: Joe Árvai, Terje Aven, Nancy Beck, Frederic Bouder, Sally M. Kane, Lisa A. Robinson

10:00 AM-10:30 AM **Coffee Break**

	Salon FG	Salon H	Salon J	Salon K	Salon 1	Salon 2
10:30 AM-Noon	T2-F Symposium: Engineering and Modeling of Resilience	T2-G Applied Risk Management: Risk Culture, Risk Values, and Compliance	T2-H Risk-Informed Priority Setting: Methods and Challenges	T2-I New Models for Dose-Response	T2-J Symposium: U.S. National Security Interests and Transnational Security Decision Making	T2-K Roundtable: Understanding Perceptions of Benefits and Risks Posed by Microbiota of Milks

Noon-1:30 PM **SRA Awards Luncheon and Business Meeting**, Salons III-VI *(Included in registration fee)*
Includes all SRA Awards, 5 Best Poster Award Winners from Monday's Poster Reception, and Images of Risk Competition Winners

1:30 PM-3:00 PM	T3-F Symposium: An Interdisciplinary Analysis of Multiple Risks and Lessons Learned from Flint, Michigan	T3-G Applied Risk Management: Integrated Risk Management, Systemic and Cascading Risks	T3-H Modeling Transmission of Microbial Contaminants in Poultry, Meat and Beyond	T3-I Symposium: The Life Cycle-Human Exposure Model (LC-HEM) Project: Research on Sentinel and Aggregate Chemical Exposures from Use of Consumer Products	T3-J Roundtable: What is the Optimal Approach to Organizing Governmental Risk-Related Science Advisory Processes	T3-K New Developments in Risk Perception and Risk Communication Theory

3:00 PM-3:30 PM **Coffee Break**, Arlington Ballroom Foyer

3:30 PM-5:00 PM	T4-F Power Systems Resilience	T4-G Symposium: Foundational Issues in Risk Analysis II	T4-H Symposium: Innovative Microbial Risk Modeling for Food Supply Chain	T4-I Roundtable: Synthetic Biology and Gene Drives - Science, Policy, and Risk	T4-J Revealing Implicit and Explicit Risk Assessment as to Financial Risk and Government Precaution	T4-K Exposure to Chemical Contaminats in Food and Drinking Water

6:00 PM-7:30 PM **Specialty Group Mixers** (see page 5 for details)

	Salon A	Salon B	Salon C	Salon D	Salon E
8:30 AM-10:00 AM	W1-A Symposium: Integrated Health Impact Assessment for Air Pollution and Global Climate Change in China	W1-B Roundtable: The EU and the US Projects & Activities in the Area of Resilience Assessment: How Far are We from a Common Global Approach?	W1-C Symposium: Methods of Quantifying Risk and Burden of Foodborne Illness	W1-D From Nanotechnology Risk Management to Innovative Governance: Developing a Reliable and Trustable Framework and Tools	W1-E Emerging Threats and Deterence
10:00 AM-10:30 AM	**Coffee Break**, Arlington Ballroom Foyer				
10:30 AM-Noon	W2-A Symposium: Burden of Disease from Environmental Hazards in the Home and Community: Why? How? What? So What?	W2-B Roundtable: Decentralization: What Might It Mean for Risk Governance?	W2-C Risk Analysis for System Risk Analysis	W2-D Roundtable: SRA Policy Forum and SRA Nano Safety Cluster Efforts	W2-E Cyber and Game Theory
Noon-1:30 PM	**Plenary Luncheon**, Salons III-VI *(Included in registration fee)* Risk Analysis and Its Scientists and Practitioners: Some Personal Stories **Speakers:** Anne Michiels van Kessenich and Scott Ferson				
1:30 PM-3:00 PM	W3-A Symposium: From Regulating to Communicating Food Safety Risks, Costs, and Benefits: Practitioners™ Challenges and Solutions	W3-B Roundtable: Science and Policy at the 2019 Fifth World Congress on Risk	W3-C Atlas Shrugged: Geospatial Decision Analysis	W3-D Hazard-Specific Risk Assessment	W3-E Symposium: Emerging Issues in Global Catastrophic Risks and Development
3:00 PM-3:30 PM	**Coffee Break**, Arlington Ballroom Foyer				
3:30 PM –5:00 PM	W4-A Frontiers in Benefit-Cost and Risk Analysis	W4-B Climate Change Communication II	W4-C Human Factors in Decision Making	W4-D Looking Across Boarders at Risk Assessment Policies	W4-E Complex Models to Solve Complex Problems
5:15 PM - 5:45 PM	**T-Shirt Giveaway and Raffle Drawing. Possibility of winning a trip to Norway.** - Registration Area				

	Salon FG	Salon H	Salon J	Salon K	Salon 1	Salon 2
8:30 AM-10:00 AM	W1-F Roundtable: Conflict of Interest and Bias in Conducting Research and Risk Assessments: Views from Multiple Perspectives	W1-G Applied Risk Managment: Monitoring, Statistical Methods, Metrics and Communication	W1-H Miscellaneous - Foundations	W1-I Exposure, Hazard and Risk Assessment: Putting Exposure Back in the Process	W1-J Roundtable: Challenges in Communicating the Results of Public Health Benefit-risk Assessments	W1-K Risk Communication at Home and the Workplace
10:00 AM-10:30 AM	**Coffee Break**, Arlington Ballroom Foyer					
10:30 AM-Noon	W2-F Interdependent Infrastructure Systems	W2-G Applied Risk Management: Three Completely Different Ways to Manage Natural Hazard Risks	W2-H Foundational Issues in Risk Analysis III	W2-I Roundtable: Embracing Chemical Exposure Science for Effective Public Health Protection	W2-J Symposium: The Risk of Citizen Opposition: Tools to Foster Public Participation with and Acceptance of Energy Policy Issues	W2-K Risk Communication and Severe/Extreme Weather
Noon-1:30 PM	**Plenary Luncheon**, Salons III-VI *(Included in registration fee)* Risk Analysis and Its Scientists and Practitioners: Some Personal Stories *(Included in registration fee)* **Speakers:** Anne Michiels van Kessenich and Scott Ferson					
1:30 PM-3:00 PM	W3-F Symposium: Integrated Research for Disaster Risk Reduction	W3-G Roundtable: Does EPAs Risk Practices Follow its Amended TSCA Pledges?	W3-H Understanding Antimicrobial Resistance as a Global Concern	W3-I PAHs & Related Compounds: Exposure and Dose-Response	W3-J Symposium: To Vape or Not To Vape: Risks of E-cigarette Use	W3-K Symposium: Reshaping Risk Assessment - New Governance Tools for Emerging Technologies
3:00 PM-3:30 PM	**Coffee Break**, Arlington Ballroom Foyer					
3:30 PM –5:00 PM	W4-F Infrastructure: Climate Changes and Extreme Events	W4-G Symposium: Interdisciplinary Perspectives on Systemic Risks	W4-H Symposium: Incorporating System Resilience Concept in Environmental Risk Analysis	W4-I Ambient and Occupational Airborne Hazards	W4-J Symposium: Risk Assessment in Tobacco Product Regulatory Decision Making	W4-K Symposium: Risk Meets Communication: A Fork in the Road or a Road Less Travelled?
5:15 PM - 5:45 PM	**T-Shirt Giveaway and Raffle Drawing. Possibility of winning a trip to Norway.** - Registration Area					

Plenary Sessions

All plenary sessions are held in the Crystal Gateway Marriott, Salons III-VI

Monday, December 11, Morning Plenary

Risk Analysis: An Obsolete Profession?

Risk analysis has advanced strongly the last 30-40 years. It is interdisciplinary in its scope but also developing as a science in itself. Yet we should ask, has it really evolved as it should? Is there a potential for reaching another level on both quality and outreach?

Is there a need for revitalization and new directions for the field and SRA, to strengthen the research and reflect current topics like resilience and security? Should we develop specific risk analysis certificates and educational programs?

The panel will discuss these topics - the role of risk analysis in society and how risk analysis as a field can be strengthened. We question, what does it really mean to be a risk analysis practitioner, professional and scientist.

Chairs:

Terje Aven, *University of Stavanger, Norway*
Pamela Williams, *E Risk Sciences*

Panel:

Michael Dourson, *US Environmental Protection Agency (EPA)*
Seth Guikema, *University of Michigan*
Ragnar Löfstedt, *Kings College, London*
Kimberly Thompson, *Kid Risk, Inc. and University of Central Florida*

Wednesday, December 13, Lunch

Risk Analysis and Its Scientists and Practitioners: Some Personal Stories

• Teaching kids about risk and risk analysis,
Anne Michiels van Kessenich, *The Netherlands*

• Title not yet decided: the value of procrastination in risk analysis,

Scott Ferson, *University of Liverpool, UK (formerly Applied Biomathematics, USA)*

Tuesday, December 12, Morning Plenary

Evidence and Knowledge-Based Decision-Making in a Risk Analysis Setting: Desired Reality or Misconception?

How has the post-truth society (in which objective facts are become less influential in shaping public opinion) been able to develop? Has science sought to stretch its domain too widely and denied uncertainties? Or was the truth not comfortable enough for those in power or seeking power? Why are “alternative facts” and “fake news” becoming household names?

As risk analysts we are aware that evidence is not only related to facts but also to beliefs and concerns that need to be taken into account in risk management and regulation. We are also aware that value judgments are equally important as a basis for decision-making as is evidence in the form of data, information and justified beliefs. However, there are clear data-driven insights that one cannot ignore. Climate change is real. And so is the risk of particulate matter for our health. The panel will discuss the role of science and in particular risk science in keeping the delicate balance between factual statements and acknowledgement of uncertainty and ambiguity.

Introduction:

Terje Aven, *University of Stavanger, Norway*

Moderator:

Sally M. Kane, *Independent Consultant*

Panel:

Joe Árvai, *University of Michigan*
Nancy Beck, *US Environmental Protection Agency (EPA)*
Frederic Bouder, *Maastricht University, The Netherlands*
Lisa A. Robinson, *Harvard T.H. Chan School of Public Health*

Technical Program

Presenter's name is asterisked (*) if other than first author. Salon B is slotted for Presidential Roundtables.

10:30 AM – 12:00 PM

Salon A

M2-A Roundtable: Risk and Economic Analysis for Development

Chair: Elisabeth Gilmore

In this roundtable, we begin a dialogue on the use of risk and economic analysis for "development and resilience", the theme of the 2019 SRA Fifth World Congress on Risk to be held in Cape Town, South Africa. Risk and economic analysis provide a foundation for improving the formulation and review of rules and regulations in many critical areas that directly affect human wellbeing, such as environmental quality, food safety, infrastructure, and security. These tools and techniques from benefit-cost analysis to mental modeling are frequently employed in developed countries, and there is the potential for more widespread use in development contexts. At the same time, using these tools in developing countries may introduce new considerations, such as a wider divergence of interests among the funders, governments, and beneficiaries as well as important distributional issues related benefits, costs and risks. In this roundtable, academics and practitioners will discuss opportunities and challenges for applying risk and economic tools in developing countries and to support development.

Panelists:
Ed Carr, Department of International Development, Community Environment, Clark University; Jo Anne Shatkin, Vireo Advisors; Luis Cifuentes, Pontificia Universidad Católica de Chile; Vanessa Schweizer, University of Waterloo; Winifred Ekezie, University of Nottingham

Sponsored by:
Economics and Benefits Analysis Specialty Group and Society for Benefit-Cost Analysis

10:30 AM – 12:00 PM

Salon B

M2-B Roundtable: Risk Analysis Around the World: Activities in the SRA Regions

Chair: Frederic Bouder

The Society for Risk Analysis (SRA) is the main arena where scientists and professionals from around the world can meet to tackle risk problems and debate the science and practice of risk analysis. In doing so the SRA is playing an instrumental role towards unifying the field of risk research and practice, as well as supporting the rise of a recognisable profession of ''risk analysts.'' Risk research and practice, on the other hand, is very diversified, in terms of professional backgrounds as well as country variations. This round table will discuss activities in the SRA regions, exploring possible synergies and collaborations. For instance participants may address issues such as: what is the state of risk analysis in the region? What are the hot topics?How is it evolving? The objective of this roundtable is to start a ''community'' discussion on how risk analysis fares in the regions.

Panelists:
Frederic Bouder, University of Stavanger (Chair), SRA Australia and New Zealand, Sandra Seno-Alday, University of Sidney, SRA Canada, Nathalie de Marcellis-Warin, CIRANO, SRA China, Chongfu Huang, Beijing Normal University, SRA Europe, Seda Kundak, Istanbul Technical University, SRA Europe Nordic , Marja Ylönen, VTT Technological Research Centre of Finland, SRA Japan, Yasunobu Maeda, Shizuoka University, SRA Korea, Yong-Jin Lee, Yonsei University, SRA Latin America, Rosa María Flores Serrano, National Autonomous University of Mexico

Sponsored by:
Engineering and Infrastructure Specialty Group

10:30 AM – 12:00 PM

Salon C

M2-C Decision Analysis for Flood Risk and Climate Change

Chair: Matthew Bates

10:30 AM **M2-C.1**
An Integrated Approach for Aiding Collaborative Decision-Making: The Flash Flood Emergency Management in Lorca (Spain)
Pluchinotta I, Giordano R, Pagano A, Tsoukias A
University Paris Dauphine

10:50 AM **M2-C.2**
Biased Risk and Benefit Perception of Human and Nature-Caused Climate Change
Hoogendoorn G, Sütterlin B, Siegrist M
ETH Zürich

11:10 AM **M2-C.3**
Coastal Protection for Megacities
Xian SY, Lin N, Oppenheimer M, Feng KR
Princeton University

11:30 AM **M2-C.4**
Accelerating Adaptation: Urgency, Barriers, and Constructed Risk in Miami Beach's Pivot to Sea Level Rise Adaptive Stormwater Management
Treuer G, Bolson J
University of Miami, Florida International University

Sponsored by:
Decision Analysis and Risk Specialty Group

10:30 AM – 12:00 PM

Salon D

M2-D Symposium: Continuous Quality Improvement: An Alternative to Standards Setting?

Chair: Tee Guidotti

10:30 AM **M2-D.1**
Continuous Quality Improvement (PDCA) in Risk Management: The Deming Cycle in Achieving Risk Reduction Beyond Fixed Standards
Guidotti TL
Occupational + Environmental Health & Medicine

10:50 AM **M2-D.2**
Manufacturing Novelty for a Purpose: the Neuroscience Basis for Continual Review and Improvement
O'Reilly MV
ARLS Consultants, State University of New York

11:10 AM **M2-D.3**
Manifesting Quality Management and CQI in Environmental, Health and Safety: ISO's Approach
Redinger CF
The Institute for Advanced Risk Management

11:30 AM **M2-D.4**
Practical Considerations for Recycling Mercury-Impacted Scrap Metal
Finster M, MacDonell M, Chang YS
Argonne National Laboratory

11:50 AM **M2-D.5**
Discussion
Aiken D

Sponsored by:
Economics and Benefits Analysis and Risk Policy and Law Specialty Groups

10:30 AM – 12:00 PM

Salon E

M2-E Roundtable: National Academies Decadal Survey of Social and Behavioral Sciences for National Security

Chair: Sujeeta Bhatt

The National Academies of Sciences, Engineering, and Medicine is conducting a decadal survey of research opportunities in the social and behavioral sciences that can contribute to national security. Decadal surveys are used to assess and project research possibilities for the coming decade. A key element of the survey is an inquiry of relevant research communities for new ideas. This roundtable will gather direct input from the scientific community and other allied professionals and useful information with respect to assessment, characterization, and communication of risk.. During the roundtable, members of the Academies' committee and staff will engage participants in a discussion, seeking ideas regarding research concepts, methods, tools, and techniques that show particular promise for building analytic capacity to address national security challenges. The roundtable discussion will be an opportunity for interdisciplinary discussion of areas such as monitoring and measuring current and evolving events, phenomena, and risks affecting societies; developing decision support systems for national security initiatives; avoiding errors and biases in decision making; and identifying and/or mitigating incidences of insider threat. More information on the decadal survey is available at http://nas.edu/SBSDecadalSurvey.

Panelists:
Sujeeta Bhatt, Jonathan Moreno, Sallie Keller, Julie Schuck

Sponsored by:
Security and Defense Specialty Group

10:30 AM – 12:00 PM

Salon FG

M2-F Water Water Everywhere

Co-chairs: Hiba Baroud, Roshi Nateghi

10:30 AM **M2-F.1**
Why the Well Runs Dry: Assessing Global Trends in Groundwater Stress
Bruss BC, Nateghi R, Zaitchik B*
Purdue University

10:50 AM **M2-F.2**
Water-Energy Nexus: Impact on Electrical Energy Conversion and Mitigation by Smart Water Resources Management
Gjorgiev B, Sansavini G
ETH Zürich

11:10 AM **M2-F.3**
Tsunamis, Sea Walls, and Memory - Vulnerability in Coastal Communities
Logan TM, Bricker JD, Guikema SD
University of Michigan, TU Delft

11:30 AM **M2-F.4**
Extreme Precipitation Analysis and Prediction for a Changing Climate
Hu H, Ayyub BM
University of Maryland, College Park

Sponsored by:
Engineering and Infrastructure Specialty Group

10:30 AM – 12:10 PM

Salon H

M2-G Symposium: Cultural Property Risk Analysis

Chair: Robert Waller

10:30 AM **M2-G.1**
Risk Analysis Targeted to Each and Every Manager's Perspective
Waller RR
Protect Heritage

10:50 AM **M2-G.2**
Evaluation of Environmental Risks and Environmental Costs at Yale Peabody Museum of Natural History
Bratasz LB, White TW, Sease CS, Uthrup NU, Butts SB, Boardmann RB, Simon SS
Yale University

11:10 AM **M2-G.3**
Chemical Deterioration and Physical Failure – Risk-Informed Archive Facility Planning
Swiatkowska B, Czop J, Jedrychowski M, Klosowska A, Okragla D, Skoczen-Rapala £, Bratasz £
National Museum in Krakow, Yale University

11:30 AM **M2-G.4**
Preparedness and Response in Collections Emergencies (PRICE) – The Smithsonian's Collections Emergency Team
Snell S
Smithsonian Institution

11:50 AM **M2-G.5**
Analyzing Risk for Cultural Property during Armed Conflict
Wegener CA
Smithsonian Institution

Sponsored by:
Applied Risk Management Specialty Group

10:30 AM – 12:00 PM

Salon J

M2-H Listeria in the Food Supply Chain: Incidence and Control Measures

Co-chairs: Moez Sanaa, Amir Mokhtari

10:30 AM **M2-H.1**
Listeria Monocytogenes in Ready-to-eat (RTE) Foods and The Risk for Human Health in the European Union (EU)
Sanaa M
Anses

10:50 AM **M2-H.2**
Listeria Incidence and Exposure: Assessing the Impacts of Changing US Population Demographics and Differing Consumption Patterns Among Groups at Higher Risk for Listeriosis
Pohl AM, Gaveleck AY, Spungen JH, Pouillot R, Van Doren JM
US Food and Drug Administration

11:10 AM **M2-H.3**
A Novel Agent-based Model of Listeria spp. Dynamics in a Food Processing Facility for Assessment of Environmental Monitoring Programs
Zoellner C, Jennings R, Wiedmann M, Ivanek R
Cornell University

11:30 AM **M2-H.4**
Interagency Listeria Monocytogenes Market Basket Survey – Results and Critical Considerations for Developing Surveys to Support Quantitative Risk Assessments
Chen Y, Pouillot R, Luchansky JB, Porto-Fett ACS, Catlin M, Kause J, Gallagher D, Van Doren JM, Lindsay JA, Dennis S
FDA Center for Food Safety and Applied Nutrition, USDA Agricultural Research Service, Virginia Tech, USDA Food Safety and Inspection Service

Sponsored by:
Microbial Risk Analysis Specialty Group

10:30 AM – 12:10 PM

Salon K

M2-I Symposium: Application of Systematic Reviews in Risk Assessment: Case Studies, Successes and Challenges from Different Domains

Chair: Katya Tsaioun

10:30 AM **M2-I.1**
Introduction to Systematic Reviews: Methods and Concepts Developed in Clinical Medicine and Their Applicability to Other Domains
Tsaioun K
Johns Hopkins Bloomberg School of Public Health

10:50 AM **M2-I.2**
Development and Refinement of a Framework for Quantitative Consideration of Study Quality and Relevance in the Evaluation of mechanistic Data Based on Key Characteristics of Carcinogens
Wikoff DS, Rager JE, Harvey S, Haws L, Chappell G, Borghoff S
ToxStrategies

11:10 AM **M2-I.3**
Application of Systematic Review: An Industry Perspective
Lewis RJ, Freeman J
ExxonMobil Biomedical Sciences

11:30 AM **M2-I.4**
Systematic Review of Factors Affecting the Onset and Progression of Neurological Disease
Krewski D
University of Ottawa

11:50 AM **M2-I.5**
Challenges in Implementing Systematic Review in TSCA Risk Evaluations
Camacho-Ramos I
U.S. Environmental Protection Agency

Sponsored by:
Risk Policy and Law Specialty Group

10:30 AM – 12:00 PM

Salon 1

M2-J Poster Platform: Interdisciplinary Risk Communication about Food and the Environment

Chair: William Hallman

10:30 AM **M2-J.1**
Who is Afraid of Tampering with Nature? Individual Differences in (Dis) comfort with Altering the Natural World
Raimi KT, Wolske KS, Hart PS, Campbell-Arvai V
University of Michigan, University of Chicago

10:30 AM **M2-J.2**
Overcoming Local Resistance to Proposed US Government Projects: A Case Study in Dredging Harbors
Poinsatte-Jones K, Trump B
U.S. Army Corps of Engineers, Risk and Decision Sciences Focus Area

10:30 AM **M2-J.3**
Examining Cognitive and Affective Factors Associated with Support for Pollution Policies in the Chesapeake Bay Watershed: Identifying Promising Messaging Strategies
Lu H, Schuldt JP, Niederdeppe J
Cornell University

10:30 AM **M2-J.4**
The Role of Trust and Perceived Similarity in Psychological Reactance Against Regulatory Wildlife Policy
Song H, McComas KA, Schuler KL
Cornell University

10:30 AM – 12:00 PM

continued

10:30 AM **M2-J.5**
Frankenfood or Farm Fresh? Measuring Support for Aquaculture among U.S. Consumers
Rickard LN, Noblet CL
University of Maine

10:30 AM **M2-J.6**
Information Asymmetry: The Heuristic Function of Nano-food Labels
Cummings CL
Nanyang Technological University, Singapore

10:30 AM **M2-J.7**
Framing, Social Stigma and Scientific Controversy: Exploring Effect and Mechanism of Question Wording about Genetically Modified Food
Jia H, Schuldt J, Zhou S, Deng L
Cornell University

10:30 AM **M2-J.8**
Responsibility, Recalls, and Reputations of Organizations: Theory-Based Experimental Studies to Improve Food Safety Crisis Communication
Wu F, Hallman WK
Rutgers University

Sponsored by:
Risk Communication Specialty Group

10:30 AM – 12:00 PM

Salon 2

M2-K Risk Communication in Public Health and Medical Contexts

Chair: Graham Dixon

10:30 AM **M2-K.1**
Mapping the Media and Risk Landscape Around Zika: Where Do People Get Information About Risk?
Wirz CD, Johnson BB
University of Wisconsin-Madison, Decision Research

10:50 AM **M2-K.2**
US Public Opinion About Insecticide Spraying in the Context of Zika Virus
Lull RB, Hallman WK, Brossard D, Jamieson KH
California State University, Fresno, Rutgers University, University of Wisconsin-Madison, University of Pennsylvania

11:10 AM **M2-K.4**
Ethics and Risk in Human Gene Editing: How Type and Use of Gene Editing Impacts Public Risk Perceptions
Howell EL, Kohl P, Scheufele DA, Xenos MA, Brossard D
University of Wisconsin-Madison

11:30 AM **M2-K.6**
Effective Communication – The Fourth Factor in Physician-Patient Relationship (PPR) in Cancer Treatment
Khan KJ, Begum N
University of Vienna

Sponsored by:
Risk Communication Specialty Group

1:30 PM – 3:00 PM

Salon A

M3-A Symposium: Modeling the Economic Aspects of Climate Change: A Critical Review of the State of the Science

Chair: Elisabeth Gilmore

1:30 PM **M3-A.1**
An Assessment of Opportunities to Improve the Climate Damage Functions in the DICE, FUND, and PAGE Integrated Assessment Models.
Rennert KJ, Wichman C
Resources for the Future

1:50 PM **M3-A.2**
Quantifying Economic Risks from Climate Change: Research Opportunities and Challenges
Diaz D
Electric Power Research Institute

2:10 PM **M3-A.3**
Current Approaches to Assessing Risks of Sea-level Rise
Kopp RE
Rutgers University

2:30 PM **M3-A.4**
Projecting Violence and Unrest Under Climate Change
Gilmore EA
Clark University

Sponsored by:
Economics and Benefits Analysis Specialty Group and Society for Benefit-Cost Analysis

1:30 PM – 3:00 PM

Salon B

M3-B Roundtable: Foundations of Safety Science - Perspectives Across Risk, Safety and Resilience

Chair: Kenneth Pettersen Gould

Safety as a particular science can be claimed to have emerged to match social ambitions for increased safety and security -- developing, experimenting and testing practical methods, tools and models with the aim of understanding and managing unwanted actions or events. Although established as a particular domain of knowledge, the status of safety science is in many ways contested. This can be at least partly due to its hybrid character, being constituted by a mix of researchers coming from different scientific traditions, and to its relatively young age as a scientific community. Moreover, safety science has been questioned over the last two decades in different ways and from different perspectives, for being, for example, incoherent in its approach to risk, showing a disregard of safety as a social construct, emphasising accident causes rather than resilience and in controversies over the role of culture in contributing to human action. In addition to their application to safety science in particular, such questions are also related to fundamental issues within disciplines and the philosophy of science, such as the possibility for modelling social systems, the workings of the human mind, and the objective existence of the phenomenon of culture. As for risk analysis, in spite of the seeming maturity of its practices the methodology as a whole still struggles with establishing a solid scientific foundation.

The aim of the symposium is to continue previous discussions held at the SRA-E and WOS conferences in Europe, bringing in additional perspectives from North America and beyond. Can the growing initiative within SRA on the foundations of risk be combined with foundational issues of safety science? How can we move forward with a dialogue to establish and strengthen the links between the two? The symposium addresses fundamental concepts, principles, goals, and methods for these fields. Work on foundational issues contributes to the development, of ways to conceptualize, assess, describe, manage, govern, and communicate risks and safety.

Panelists:
Nick Pidgeon, Cardiff University; Paul Schulman, Mills College; Kathleen Sutcliffe, Johns Hopkins Business School; David Woods, Ohio State University

Sponsored by:
Foundational Issues in Risk Analysis Specialty Group

1:30 PM – 3:00 PM

Salon C

M3-C Health Risk & Decision Analysis

Chair: Daniele Wikoff

1:30 PM **M3-C.1**
Analysis of Hazard Evaluation Data and the Development of a Risk-Based Inspections Schedule for the Environment Agency-Abu Dhabi
*Akl S, Turner MB, Rady AS, Al Ashram M, Kalimuthu , Lloyd JM, Beauchamp C, Al Hajer K, Al Waheebi A, Lillys T**
Research Triangle Institute and Environment Agency-Abu Dhabi

1:50 PM **M3-C.2**
Application of Systematic Review in the Evaluation of Caffeine Safety: Potential Adverse Effects of Caffeine Consumption in Healthy Adults, Pregnant Women, Adolescents, and Children
Wikoff DW, Welsh BT, Henderson R, Brorby G, Britt J, Myers E, Goldberger J, Lieberman HR, O'Brien C, Doepker C
ToxStrategies

2:10 PM **M3-C.3**
Evaluating the Capability of Health Systems with Multi-criteria Decision Analysis
Montibeller G, Del Rio Vilas V, Carreras A, Franco LA
Loughborough University

2:30 PM **M3-C.4**
Overview and Demonstration of USEPA's Risk-Informed Materials Management (RIMM) Tool System
Babendreier JE, Taylor T
U.S. Environmental Protection Agency

Sponsored by:
Decision Analysis and Risk Specialty Group

1:30 PM – 3:00 PM

Salon D

M3-D Symposium: Commercializing Nanoscale Materials: Occupational Safety and Health through Risk Assessment and Risk Management

Co-chairs: Debra Kaden, James Ede

1:30 PM **M3-D.1**
Occupational Safety and Health of Nanoscale Materials
Howard J
US Government

1:50 PM **M3-D.2**
An EH&S Approach for Commercialization of Novel Forms of Nanocellulose
Nelson K
American Process

2:10 PM **M3-D.3**
Practical Considerations for the Assessment and Control of Exposures to Engineered Nanomaterials in the Secondary Industry
Maberti S
ExxonMobil Biomedical Sciences Inc.

2:30 PM **M3-D.4**
Method Development for Measuring and Assessing Exposure to Nanomaterials in the Workplace
Shatkin JA, Foster EJ, Peters TF
Vireo Advisors, LLC

Sponsored by:
Emerging Nanaoscale Materials and Occupational Health and Safety Specialty Groups

1:30 PM – 3:00 PM

Salon E

M3-E Symposium: Game Theory, Decision Analysis for Homeland Security and Disaster Management

Chair: Bairong Wang

1:30 PM **M3-E.1**
A Signal Detection Model and Analysis of Risk-Based Threat Assessment
John RS
University of Southern California

1:50 PM **M3-E.2**
The Hurricane Decision Simulator and Its Impact on Decision Making
MacKenzie CA, Regnier E, Hetherington S, Prisacari A
Iowa State University

2:10 PM **M3-E.3**
Estimating Effectiveness of Investment, Optimal Resource Allocation, and Predictive Risk Analytics for Fire Protection
Madasseri Payyappalli V, Behrendt A, Zhuang J
University at Buffalo, The State University of New York

2:30 PM **M3-E.4**
Rumor Response, Debunking Response, and Decision Makings of Misinformed Twitter Users During Disasters
Wang B, Zhuang J
University at Buffalo, SUNY

Sponsored by:
Security and Defense and Decision Analysis and Risk Specialty Groups

1:30 PM – 3:10 PM

Salon FG

M3-F Symposium: The Interface Between Infrastructure and Societal Resilience

Chair: Allison Reilly

1:30 PM **M3-F.1**
Modeling Dynamic Vulnerability and Risk at the Community Level with Agent-Based Modeling
Zhai C, Guikema SD, Reilly AC
University of Michigan, Ann Arbor

1:50 PM **M3-F.2**
Strengthening Infrastructure Resilience through Insurance and Economic Incentives
Tonn GL, Czajkowski JR, Kunreuther HC
Wharton Risk Management Center

2:10 PM **M3-F.3**
Seismic Changes for Financing the FEMA Public Assistance Program but Seismic Changes for Regional Risk?
Reilly AR, Tonn G, Ghaedi H, Guikema SD
University of Maryland

2:30 PM **M3-F.4**
Converting Vulnerable Landscapes to Resilient Community Assets
*Nelson KS, Camp JS**
Vanderbilt University

2:50 PM **M3-F.5**
Community Resilience: Establishment of Foundational Indicators and Variables for Use in an Integrated Dynamic Assessment Framework
Gillespie-Marthaler L, Nelson KS, Baroud H, Abkowitz M
Vanderbilt University

Sponsored by:
Engineering and Infrastructure Specialty Group

1:30 PM – 2:30 PM

Salon H

M3-G Applied Risk Management: Disruptive Technologies, AI and Cyber

Chair: Dan Hudson

1:30 PM **M3-G.1**
Disruptive Technologies and Physical Security - Good, Bad, or Indifferent?
Canjar HA

1:50 PM **M3-G.2**
New Game, New Rules: Responding to Disruptive Trends in Financial Services
Hall IS
University of Northampton

2:10 PM **M3-G.4**
Multidisciplinary Risk Management in Cybersecurity: Course Development
Tatar U, Keskin OF, Poyraz OI, Pinto CA, Kucukkaya G
Old Dominion University

Sponsored by:
Applied Risk Management Specialty Group

1:30 PM – 3:00 PM

Salon J

M3-H Evaluating the Impact of Risk Factors and Control Measures: From Drinking Water to Produce and Nuts

Co-chairs: Jane Van Doren, Hao Pang

1:30 PM **M3-H.1**
Risk of Pre-Harvest Microbiological Contamination in Tomatoes: Effects of Meteorological, Farm Management, and Environmental Factors
Pang H, Pradhan AK
University of Maryland

1:50 PM **M3-H.2**
The Impact of a Microbial Reduction Treatment on the Risk of Human Salmonellosis from the Consumption of Almonds and Pecans in the United States: A Comparison
Santillana Farakos SM, Pouillot R, Davidson GR, Johnson R, Spungen J, Son I, Anderson NA, Van Doren J
Food and Drug Administration

2:10 PM **M3-H.3**
An Advanced Legionellosis Risk Model Incorporating Epidemiological Evidence of Disease Burden
Weir MH, Mraz AL, Mitchell J
The Ohio State University

2:30 PM **M3-H.4**
Development of a Mathematical Model for the Influence of Relative Humidity on the Survival of Salmonella on Cucumbers
Jung J, Schaffner DW
Rutgers University

Sponsored by:
Microbial Risk Analysis Specialty Group

1:30 PM – 3:00 PM

Salon K

M3-I Symposium: From Sensors to Risk Decisions: How Can We Use Sensor and Personal Monitoring Data to Better Inform our Risk Assessment and Regulatory Decisions?

Chair: Sabine Lange

1:30 PM **M3-I.1**
Interpreting and Communicating Short-Term Sensor Data
Jenkins S, Mannshardt E, Stone S, Keating M, Brown J, Long T
United States Environmental Protection Agency

1:50 PM **M3-I.2**
Understanding the Ambient - Personal PM2.5 Correlation: Integrating from Across Different Studies
Jones L, Schaefer H, Lange S
Texas Commission on Environmental Quality

2:10 PM **M3-I.3**
Direct Reading and Sensor Technologies: Opportunities to Advance Occupational Risk Management
Hoover MD, Snawder JE
National Institute for Occupational Safety and Health

2:30 PM **M3-I.4**
Pollution Gets Personal: Reporting Personal Exposure to Environmental Chemicals when Health Implications are Uncertain.
Brody JG, Boronow KE, Susmann H, Ohayon JL, Morello-Forsch RA, Brown P, Rudel RA
Silent Spring Institute, Northeastern University, University of California, Berkeley

Sponsored by:
Exposure Assessment and Occupational Health and Safety Specialty Groups

1:30 PM – 3:00 PM

Salon 1

M3-J Roundtable: Applications of Automation, Computational, and Informatic Tools to Operationalize Human Health Risk Assessments at EPA

Chair: Ingrid Druwe, J Allen Davis

The challenges facing the risk assessment community in the 21st century, especially the need to screen large databases of toxicological information in order to provide relevant and timely human health risk assessments to interested stakeholders, represent a unique opportunity to advance the field given the advent of multiple technologies and the evolution of systematic review methods. When conducting assessments on chemicals with large databases, it can be difficult to efficiently screen tens of thousands of references to identify the most relevant, high quality studies to use. And once those references are identified, effectively and transparently managing the data to support hazard identification and dose-response analyses can prove to be a formidable task. In response to this challenge, the U.S. EPA's National Center for Environmental Assessment (NCEA) is leading efforts to develop and apply advancements in data science, machine learning, automation of systematic review, data integration, and dose response modeling in order to efficiently produce human health risk assessments in a timely fashion that meet the needs of our stakeholders. The objective of this Roundtable is to bring together a diverse group of experts at the forefront of risk assessment science and provide a platform for discussing strategies for making systematic review feasible in human health assessments, including the concept of fit-for-purpose evaluations and use of specialized software (SWIFT, HAWC) to increase productivity and improve data-content management. These tools and methods will improve data sharing with stakeholders, other Federal and State agencies and promote the integration of new approach methods (NAM) into human health risk assessment.

Panelists:
Kris Thayer, Andy Shapiro, Iris Camacho, Jason Lambert, Samantha Jones, Xabier Arzuaga

Sponsored by:
Dose-Response, Exposure Assessment, Decision Analysis and Risk, and Ecological Risk Assessment Specialty Groups

1:30 PM – 3:00 PM

Salon 2

M3-K All About Energy

Chair: Amanda Boyd

1:30 PM **M3-K.2**
A Study of Japanese people's Awareness about Radiation after the Fukushima Daiichi Nuclear Power Plant Accident
Oiso S
Institute of Nuclear Safety System

1:50 PM **M3-K.3**
Crisis Events, Risk Communities, and the Evolution of Public Support for Nuclear Energy in the United States
Gupta K, Nowlin M, Ripberger J, Jenkins-Smith H, Silva C
University of Oklahoma

2:10 PM **M3-K.7**
Symbolic Information on Naturalness and Its Biasing Effect on the Evaluation of Energy Technologies and Environmental Hazards: The Case of Fracking
Sütterlin B, Siegrist M
ETH Zürich

2:30 PM **M3-K.9**
Risk Perceptions of Smart Meters: Examining the Role of Privacy Concerns, Technological Readiness, and Technological Norms
Joo J, Hmielowski J, Boyd A
Washington State University

Sponsored by:
Risk Communication Specialty Group

3:30 PM – 5:00 PM

Salon A

M4-A Benefits, Costs and Risks for Health Environment

Chair: Deborah Aiken

3:30 PM **M4-A.1**
Controlling Diesel Emissions in Mexico City: A Benefit-cost Analysis
Evans JS, Hammitt JK, Rojas-Bracho L*
Harvard Center for Risk Analysis, Toulouse School of Economics

3:50 PM **M4-A.2**
Uncertainty Analysis in RIAs for Transportation Safety and Air Pollution Regulations
Aiken D, Good DH, Krutilla K*
Department of Transportation, Indiana University

4:10 PM **M4-A.3**
Monetizing Benefits of Preventing Global Deaths from Foodborne Illness
Hoffmann S
USDA Economic Research Service

4:30 PM **M4-A.4**
LNT and Economic Analysis
Williams RA, Yamoun DY
George Mason University

Sponsored by:
Economics and Benefits Analysis Specialty Group and Society for Benefit-Cost Analysis

3:30 PM – 5:00 PM

Salon B

M4-B Roundtable: SRA Specialty Groups: The Profession, The Practitioners, The Research

Co-chairs: Patricia Nance, Frederic Bouder

Over the years SRA members have established a growing number of specialty groups, which cover most aspects of risk analysis from various facets of risk assessment down to management, communication and policy stages. A number of questions may be asked: do new issues require new specialty groups to be established? And how effective are existing Specialty groups? Can we learn from other promising initiatives? Should plans be made to make specialty groups even more attractive and relevant? This panel discussion will focus on substance issues of risk analysis, compare experiences – what we have in common and what are the differences, as well stimulate innovative thinking to explore ways of making this central feature of SRA even more effective.

Panelists:
Bailey A, Baroud H, Chiu W, Crowther K, Guidotti T, Guikema S, Hristozov D, Jessup A, Lathrop, J, Schweizer, V, Stevens, Y, Wilkins, A

3:30 PM – 5:10 PM

Salon C

M4-C Symposium: The Practice and Research of Resilience

Chair: Igor Linkov

3:30 PM **M4-C.1**
Robustness and Resilience of Large-Scale Command and Control Networks
Ganin A, Kitsak M, Eisenberg DA, Alderson DL, Linkov I
University of Virginia, U.S. Army Engineer Research and Development Center, Northeastern University, Arizona State University, Naval Postgraduate School

3:50 PM **M4-C.2**
Can You Be Smart and Resilient at the Same Time?
Marchese DC, Linkov I
U.S. Army Engineer Research and Development Center

4:10 PM **M4-C.3**
Practical Application of the SmartResilience Methodology for Assessing Resilience of Multiple Critical Infrastructures
Øien K, Jovanović AS
EU-VRi, Germany

4:30 PM **M4-C.4**
Integrating Resilience Across the Organization
Wood MD, Blue S, Cato C, Wells E, Zemba V, Linkov I
U.S. Army Engineer Research and Development Center, U.S. Army Institute for Behavioral and Social Sciences

4:50 PM **M4-C.5**
Perspectives on Resilience Scholarship and Research
Palma-Oliveira J
University of Lisbon

Sponsored by:
Decision Analysis and Risk Specialty Group

3:30 PM – 5:00 PM

Salon D

M4-D Symposium: Global Catastrophic Risk Assessment, Policy and Communication

Chair: Seth Baum

3:30 PM **M4-D.1**
Towards Integrated, Comprehensive Assessment of Global Catastrophic Risks to Inform Risk Reduction
Barrett AM
GCR Institute, ABS Consulting

3:50 PM **M4-D.2**
Barriers to Proactive Population Relocation in Preparation for Coastal Flooding
Bier VM
University of Wisconsin-Madison

4:10 PM **M4-D.3**
Evaluating the Preparedness of the U.S. Emergency Management System for Managing Global Catastrophic Risk
Brown JT
Congressional Research Service

4:30 PM **M4-D.4**
Communicating Risk Assessments for Policymaking
Ritterson R
Gryphon Scientific, LLC

Sponsored by:
Decision Analysis and Risk Specialty Group

3:30 PM – 5:10 PM

Salon E

M4-E Symposium: SETAC and SRA Joint Symposium on Bridging Human and Ecological Risk Assessment

Co-chairs: Patricia Nance, Charles Menzie

3:30 PM **M4-E.1**
One Health: Opportunities for SRA and SETAC Leadership and Cooperation to Improve the Health of People, Animals and the Environment
Augspurger T, Basu N
U.S. Fish and Wildlife Service, McGill University, Ste-Anne-de-Bellevue

3:50 PM **M4-E.2**
Integration of Emerging Science into Characterizing Toxicity for Ecological & Human Health
Johnson MJ, Braydich-Stolle L
US Army Public Health Center, US Air Force Research Laboratory

4:10 PM **M4-E.3**
Integration of Ecological Risk Assessment with the Assessment of Risk to Human Health and Well-being within a Bayesian Network Framework as Applied to the Salish Sea.
Landis WG, Harris MJ
Western Washington University, Whatcom Conservation District

4:30 PM **M4-E.4**
The Development and application of Weight-of-evidence Methodologies for Human and Ecological Risk Assessment: Common Pathways over Uneven Terrain
Menzie C, Kashuba R
Society of Environmental Toxicology and Chemistry (SETAC)

4:50 PM **M4-E.5**
Communicating Risk Sciences Related to Human and Ecological Risks
Nance P
University of Cincinnati

Sponsored by:
Ecological Risk Assessment Specialty Group

3:30 PM – 5:00 PM

Salon FG

M4-F Infrastructure Resilience

Chair: Stanley Levinson

3:30 PM **M4-F.1**
Redesigning Resilient Infrastructure Research
Seager TP
Arizona State University

3:50 PM **M4-F.3**
Emergent and Future Conditions Disrupting PERT/CPM Schedule Analysis of Infrastructure Systems
Collier ZA, Lambert JH
University of Virginia

4:10 PM **M4-F.4**
Infrastructure Planning Under climate Change – Bridging Robustness and Probabilistic Approaches
Shortridge JE, Zaitchik BF
Virginia Tech

4:30 PM **M4-F.5**
Current Efforts to Establish a Common Methodology and Common Database for the Resilience Indicator Based Assessment
Jovanović AS, Øien K
EU-VRi, Steinbeis Advanced Risk Technologies, Germany

Sponsored by:
Engineering and Infrastructure Specialty Group

3:30 PM – 5:10 PM

Salon H

M4-G Symposium: Foundational Issues in Risk Analysis I

Chair: Jon T. Selvik

3:30 PM **M4-G.1**
Data Analytics, Risk Analysis, and Uncertainty
Guikema SD, Flage R
University of Michigan

3:50 PM **M4-G.2**
How to Address Uncertainty in security Risk Management
Jore SH
University of Stavanger, Norway

4:10 PM **M4-G.3**
Risk assessment Assumptions – Uncertainty and Bias
Flage R
University of Stavanger

4:30 PM **M4-G.4**
Quick Bayes Offers Performance Guarantees and Easy Risk Communication
Ferson S, O'Rawe J
University of Liverpool, Applied Biomathematics

4:50 PM **M4-G.5**
Taking the Reins: How Decision-Makers Can Stop being Hijacked by Uncertainty
*Finkel AM, Gray GM**
Univ. of Pennsylvania, Univ. of Michigan, George Washington Univ.

Sponsored by:
Foundational Issues in Risk Analysis Specialty Group

3:30 PM – 5:00 PM

Salon J

M4-H Applied Risk Management: Managing Four Completely Different Risks: Mutagenic, Imparities, Civil Aviation, Radon and Water Supply

Chair: TBD

3:30 PM **M4-H.1**
Mutagenic Impurities and Human Pharmaceuticals: A Discussion of ICH M7 and Negligible Risk
Cragin DW, Galloway SM, Hollick ND
Merck & Co., Peking University

3:50 PM **M4-H.3**
Reducing Early Life Exposure to Radon: A Challenge for Childcare Facilities
Nicol AM
Simon Fraser University

4:10 PM **M4-H.4**
Nontraditional Irrigation Water: Understanding Farmers' Needs and Risk Perceptions
Goldstein RER, Suri MR, Dery JL, Brassill NA, Pee DG, Goeringer LP, Rock CM
University of Maryland

Sponsored by:
Applied Risk Management Specialty Group

3:30 PM – 5:10 PM

Salon K

M4-I Symposium: Opportunistic Pathogens in Premise Plumbing

Chair: Kerry Hamilton

3:30 PM **M4-I.1**
Opportunistic Pathogen Dose-response Models
Mitchell JM, Dean KJ, Tamrakar SB, Huang Y, Rose J*
Michigan State University

3:50 PM **M4-I.2**
Non-consumptive Drinking Water Use and Microbial Risk – Do We Need a Safe Breathing Water Act?
Bartrand TB, Carotenuto AC
ESPRI Institute

4:10 PM **M4-I.3**
Reverse QMRA for Opportunistic Pathogens in Premise Plumbing
Hamilton KA, Gurian PL
Drexel University

4:30 PM **M4-I.4**
Meta-Analysis of Legionella Interactions with Protozoa and Human Macrophage
Mraz AL, Weir MH
The Ohio State University

4:50 PM **M4-I.5**
Water Chemistry and Micriology Changes as Plumbing Ages
Whelton AJ, Salehi M, Abouali M, Wang M, Zhou Z, Nejadhashemi AP, Mitchell J, Caskey S
Purdue University

Sponsored by:
Dose Response and Microbial Risk Analysis Specialty Groups

3:30 PM – 5:00 PM

Salon 1

M4-J Poster Platform: Applications of Automation, Computational, and Informatic Tools to Operationalize Human Health Risk Assessments at EPA – the Genius Studio

Chair: Ingrid Druwe, J Allen Davis

3:30 PM **M4-J.1**
SWIFT-Review: A Text-Mining Workbench for Systematic Review
Howard BE, Tandon A, Phillips J, Shah R
Sciome, LLC

3:30 PM **M4-J.2**
SWIFT-Active Screener: Reducing Literature Screening Effort Through Machine Learning for Systematic
*Howard BE, Miller K, Phillips J, Tandon A, Phadke D, Mav D, Shah R**
Sciome, LLC

3:30 PM **M4-J.3**
HAWC (Health Assessment Workspace Collaborative): A Modular, Web-based Interface to Facilitate Development of Human Health Assessments of Chemicals
Shapiro AJ, Addington JA, Rooney AA, Boyd WA
US National Toxicology Program

3:30 PM **M4-J.4**
HERO: Tools for Systematic Review to Support U.S. EPA Science Assessments
Jones RM, Thacker S
United States Environmental Protection Agency

3:30 PM **M4-J.5**
EPA's Benchmark Dose Software and Related Dose-Response Models and Methods
Davis JA, Gift J
US Environmental Protection Agency

3:30 PM **M4-J.6**
The EPA Comptox Chemistry Dashboard: A Web-based Data Integration Hub and Its Applications to Supporting Risk Assessment
Williams AJ, Shah I, Patlewicz G, Wambaugh J, Grulke C, Edwards J, Richard A, Judson R
Environmental Protection Agency

3:30 PM **M4-J.7**
DRAGON ONLINE: Tool for Systematic Literature Review
Bornstein K, Williams A, Hobbie K, Cawley M, Feiler T, Henning C, Turley A
ICF

3:30 PM **M4-J.8**
DoCTER: Text Analytics to Prioritize Literature Search Results for Review
Hobbie K, Cawley M, Turley A, Varghese A
ICF

3:30 PM **M4-J.9**
Systematic Review Automation Technologies: Available Tools and Best Practices
O'Blenis PA, Stefanison I
Evidence Partners Inc

Sponsored by:
Dose-Response, Exposure Assessment, Decision Analysis and Risk, and Ecological Risk Assessment Specialty Groups

3:30 PM – 5:10 PM

Salon 2

M4-K Climate Change Communication I

Chair: Sol Hart

3:30 PM **M4-K.1**
The Causal Effect of Flood Experience on Climate Engagement: Evidence from Search Requests for Green Electricity in Germany
*Osberghaus D, Demski C**
Centre for European Economic Research, Cardiff University

3:50 PM **M4-K.2**
Integrating the Socio-Ecological Perspective in Predicting Willingness to Take Actions to Mitigate Climate Change Impacts: A Case for Michigan's Huron River Watershed
Tsai J, Cheng C, Esselman R
Northern Arizona University

4:10 PM **M4-K.3**
Risk Perceptions of Enhanced Weathering as a Biological Negative Emissions Option
Pidgeon NF, Spence E
Understanding Risk Research Group, Cardiff University

4:30 PM **M4-K.5**
Denying Denialism: Uncovering the Methods and Institutions of Climate Change Denial
Frey HC
North Carolina State University

4:50 PM **M3-K.6**
Decomposing the Public's Fear of Nuclear Power
Vaishnav P, Abdulla A
Carnegie Mellon University

Sponsored by:
Risk Communication Specialty Group

6:00 PM – 8:00 PM

Poster Reception

Salons III-VI

Risk, Policy and Law

P.1 Identification of Potential Biological Hazards in Groundwater Underlying Cemeteries and Graveyards
Leung ACW, Minnery JG, Chung R
Public Health Ontario

P.2 Climate Change Vulnerability, Risk Assessment and Adaptation Scenario Development for Municipalities
Thorne ST, Kovacs DK, Austin LA, Qiu X, Horb E, Martyn N, Hay A
Decision Partners, Inc., Novus Environmental, RiskLogik, Southern Harbour

P.3 Development of Methodology for Finding Underestimated Chemical Substances for Health Risk Based on Human Kinetic Adjustment Factor Analyzed by QPPR-PBPK Model
Sato N, Kojima N, Tokai A
Osaka University

P.5 Risk-based National Standards of the Republic of China (CNS) on Chemical Level in Consumer Products: A Suggested Framework
Chuang YC, Huang SZ, Wu C, Wu KY
National Taiwan University

P.6 Awareness-Based Risk Management: Seeing, Transforming, and Unleashing Organizational Capacity
Redinger CF
The Institute for Advanced Risk Management

P.7 Developing the Probability Prediction Model for the Carcinogenic potency by Using the Bayesian Method to Support Hazard Assessment Under Japan's Chemical Substances Control Law
Yamaguchi H, Yamada T, Hirose A
National Institute of Health Sciences

P.8 The IRGC Approach to Risk and Resilience Assessment – The IRGC Resource Guide on Resilience
Florin MV, Linkov I, Trump B
IRGC, EPFL

Decision Analysis and Risk

P.9 State of Knowledge and Data Gaps Regarding the Potential for Cyanide Poisoning from Consumption of Apricot Kernels in the United States
Savidge MJ, Hsu LC, Smegal DC
U.S. Food and Drug Administration

P.10 Understanding the Causes and Consequences of Harms to Residents of Retirement Homes in Ontario, Canada
Mangalam S, Pham P, Castellino A, Salamati F*
PRISM Institute

P.12 Qualitative Risk Assessment for Drinking Water Standards Using TTC Approach
Hughes B, Cox K, Bhat V
NSF International

P.13 YPLL: A Comprehensive Quantitative Tool to Evaluate Worker Risk Under Green and Sustainable Remediation
Greenberg GI, Beck BD
Gradient

P.14 Quantitative Microbial Risk Analysis (QRMA) on Risk's Estimative Associated with Infectious Waste in Blood Centers
Gois LHB, Monteiro LKS, Jorquera O, Cohim E, Kiperstock A*
Universidade Federal da Bahia

P.15 Reliability as a Method for Risk Assessment in Hemovigilance
Calazans B, Pessoa RWS, Coutinho IBS, Oliveira-Esquerre KPR, Kiperstok A*
Federal University of Bahia - UFBA

P.16 Urban Heat Projections in a Changing Climate: Washington D.C. as a Case Study
Zhang Y, Ayyub BM
Center for Technology and Systems Management, University of Maryland, College Park

P.17 International Activities Related to Development of Guidance on Human Intrusion in the Context of Disposal of Radioactive Waste
Barr C, Pinkston K, Seitz R, Bailey L, Guskov A, McKenney C*
United States Nuclear Regulatory Commission, Savannah River National Laboratories, Radioactive Waste Management Limited, UK, International Atomic Energy Agency

P.18 A TOPSIS-based Model for Performance Appraisal of Risk Management System
Sheikh Hassani N
Akdeniz University

P.20 Primary Voting Risk Management
Gurian PL
Drexel University

P.21 Moral Hazard in Loss Reduction and the State Dependent Utility
*Hong J, Seog S**
Seoul National University

P.22 A Single Changepoint Software Reliability Growth Model with Heterogeneous Fault Detection Processes
Nagaraju V, Fiondella L, Wandji T
University of Massachusetts Dartmouth

P.23 Entropy for Quantifying Uncertainty and Risk in Economic Disparity
Mishra S, Ayyub B, Zhang Y
University of Maryland College Park, International Finance Corporation

P.24 Practical Multi-Criteria Decision Analysis with an Alternatives Assessment Framework
Howard B, Kenney M, Gerst M, Giraud R
American Chemistry Council

P.25 Inspections Outcomes and Their Association with Contract Manufacturing and Drug Application Submissions
Liu W, Schick A, Kazemi R
US Food and Drug Administration (FDA)

P.26 A Probabilistic Risk Model for Contaminated Site Management
Bailey A, Peterson J
SLR International Corporation

P.27 Implications of Anthropogenic Climate Change on Radioactive Waste Disposal in the United States
Lee RC, Crowe B, Duffy P, Sully M, Levitt D, Black P
Neptune and Company, Inc.

P.28 Assessing Consumer Product Manufacturers' Tradeoffs Among Design Criteria in Chemical Substitution Decisions
Rao V, Francis R, Tanir J
The George Washington University, Human and Environmental Sciences Institute

P.30 An Algorithmic Adversarial Risk Analysis Aproach for Bi-agent Influence Diagrams
González-Ortega J, Ríos Insua D
ICMAT

P.33 Untangling the Mystery of Assessing Snow Avalanche Hazard - A Conceptual Model
Haegeli P, Statham G, Birkeland KW, Greene E
Simon Fraser University, Parks Canada Agency, USFS National Avalanche Center, Colorado Avalanche Information Center

P.34 Simulation of Reconstruction of the Affected Area of 2011 Great East Earthquake
Maeda Y, Masuda R
Shizuoka University

P.35 Developing a Decision Framework for Outer Continental Shelf Sand Resource Management
Bates ME, Fox-Lent C, Corr J, Cialone M, Knorr P
US Army Corps of Engineers

P.36 Probability Distortion is an Optimal Response to Imprecise Probabilities
Johnson KL, Luhmann CC
Stony Brook University

P.37 Risk Evaluation in Peer Review of Grant Applications
Gallo SA, Thompson L, Schmaling K, Glisson S
American Institute of Biological Sciences

P.38 Evaluating Impacts to the DoD Mission and the Defense Industrial Base from Chemical Regulation Under the Amended Toxic Substances Control Act
Vogel C, Rak A, Underwood P, Scanlon K, Bandolin N, Esola S
Noblis, Inc., U.S. Army Public Health Command, DoD Defense Contract Management Agency Industrial Analysis Group

P.39 Analysis of Consumers' Preference to Accidental and Chemical Risk in a Purchase of a Domestic Appliance
Tsunemi K, Kawamoto A, Ono K
National Institute of Advanced Industrial Science and Technology

Dose-Response: Chemical Specific Methods and Results

P.40 Methodology for Deriving Provisional Advisory Levels (PALs) for Chlorine
Kobylewski-Saucier SE, Taylor ML, Lipscomb JC
Consolidated Safety Services Inc, WinTech LLC, US Environmental Protection Agency

P.42 Implications of Recent Changes to the Toxicity of 1,4-Dioxane on the Derivation of Regulatory Criteria
Sager SL, Forsberg ND, Prucha C, Bull L
ARCADIS U.S., Inc., Waste Management

Dose-Response: Tools to Operationalize Human Health Risk Assessment

P.43 Use of DistillerSR to Facilitate Systematic Reviews
Wilkins A, Thayer K
Federal Government

P.44 Validation and Application of a Text Mining Tool for Identification and Categorization of Mechanistic Data Related to the Key Characteristics of Carcinogens: Case Studies of a Problem Formulation Tool
Chappell G, Welsh B, Harvey S, Harris M, Wikoff D
ToxStrategies, Inc.

P.45 Proposed Key Characteristics of Male Reproductive Toxicants as a Method for Organizing and screening Mechanistic Evidence for Non-cancer Outcomes
Arzuaga X, Yost E, Hotchkiss A, Beverly B, Gibbons C
U.S. Environmental Protection Agency, National Center for Environmental Assessment, National Institutes of Health, National Institute of Environmental Health Sciences, National Toxicology Program

P.46 High-throughput Benchmark Dose Modeling Using a web-application and Python Interface Library for US EPA Benchmark Dose Modeling Software (BMDS)
Shapiro AJ
US National Toxicology Program

P.47 A Web-based Bayesian Dose-Response Assessment System
Shao K, Shapiro A
Indiana University

P.48 Defining Priors for Bayesian Dichotomous Dose-Response Analysis
Allen BC, Blessinger TD
U.S. Environmental Protection Agency, Independent Consultant

Dose-Response: Predicting and Observing

P.49 Applying in Vitro Toxicity Data to Inform Chemical Risk Assessment
Wheeler MW, Bailer JB, Whittaker C
National Institute for Occupational Safety and Health

P.50 Estimating Chronic Toxicity Values from Short Term Tox Tests: Application to Chemical Substitution Decisions
Kratchman J, Gray G
George Washington University

P.51 The Correlation Between Liver Tumor Incidence and Early-stage Liver Weight Change - An Analysis Using NTP Data
Chen Q, Shao K
Indiana University

P.52 NMR-and MS-based Metabolomics to Investigate Molecular Effects of Repeated Dose Exposure of Maleic acid in Spague-Dawley Rats
Wu C, Chen CH, Chen HC, Liang HJ, Chen ST, Lin WY, Wu KY, Chiang SY, Lin CY
National Taiwan University

P.53 Evaluating the Association between Alterations in Maternal Thyroid Hormones and Adverse Neurodevelopmental Outcomes
Brown L, Reichle L, Klein R, Ginsberg G
Abt Associates, Inc., Partnership for Pediatric and Environmental Health

P.54 Estimate of IQ loss in Infants Due to Exposure to Arsenic in Infant Cereals
Lynch MT, Chiger A, Houlihan J
Abt Associates Inc., Healthy Babies Bright Futures

P.55 Association with Using Statins and the Risk of New Diagnosis Diabetes Mellitus in Transient Ischemic Attack Patients
Ho WC, Yin MC, Chu YR, Peng YH, Tsan YT, Chen PC
China Medical University

P.56 Statin Use and Temperature on Transient Ischemic Attacks Among Diabetes Mellitus Patients
Chang PH, Chou YJ, Yin MC, Chu YR, Tsan YT, Chan WC, Ho WC, Chen PC
China Medical University

Ecological Risk Assessment

P.57 Environmental risk assessment in e-SCM
Mohammadabbasi M, Sheikh Hassani N
Tehran University

Economics and Benefits Analysis

P.59 Minimizing Average Procurement Unit Cost for Rotorcraft Tradespace Exploration
Bhattacharya S, Nagaraju V, Fiondella L, Spero E, Ghoshal A
University of Massachusetts, Dartmouth

P.60 Economic Recession of Old Industry Base in Northeast China
Jiang HZ, Tiffany P
Northeast Yucai School, University of California Berkeley

P.61 Annualized Loss of Revenue Caused by Cyber-attacks for Power Generation in Virginia Using Agent-Based Modeling
Poyraz OI, Keskin OK, Pinto CA*
Old Dominion University

P.62 Can Scanner Food Purchase Data Help Us Identify Sources of Foodborne Illness?
Ashton L, Berck P, Cole D, Hoffmann S, Todd J*
University of Wisconsin - Madison, University of California, USDA Animal Health Inspection Service, USDA Economic Research Service

Emerging Nanoscale Material

P.63 Consumer Approval of Nanomaterials in Food and Medicine
Hilgard J, Nucci ML, Hallman WK
Annenberg Public Policy Center, University of Pennsylvania, Illinois State University, Rutgers University

Engineering and Infrastructure

P.65 Understanding the Growing Costs for FEMA's Public Assistance Program: The Role of repeated Hazards and Institutional Knowledge by Applicants
Ghaedi H, Reilly A
University of Maryland

P.66 Costs of Seismic Retrofits of Existing Federal Buildings for Disaster Resilience
Halper SH, Saadat Y, Ayyub BM
University of Maryland, College Park

P.67 Validating and Improving Downscaling Methods of Global Climate Model Results in Predicting Extremes using Copula
Hu H, Ayyub BM
University of Maryland, College Park

P.68 Risk Perception on Hydrogen Fueling Stations for Japanese Public with Risk and Benefit Information
Ono K, Tsunemi K
AIST

P.69 Reliability Analysis of a Containment System, Transport and Segregation of Effluents
Santana SPB, Pessoa RWS, Oliveira-Esquerre KP
Federal University of Bahia

P.70 Resilience-oriented Analysis of Risk Management and Ontology-based Categorisation of Hazards in Interdependent Infrastructure Systems
Yan J, Tang J
Future Resilient Systems, Singapore-ETH Centre

P.71 Traffic-Accidents Prediction Using Advanceds Machine Learning Techniques
Aguiar Filho A, Soares ES, Esquerre KP, Barreto TB, Pessoa RW*
Federal University of Bahia

P.72 Optimal Re-allocation of Cargo Across Transportation Modes for the Recovery of Throughput During an Inland Waterway Disruption
Amodeo DC, Francis R
The George Washington University

P.73 Measuring the Impact of Socio-Economic Status on Post-Hurricane Power Restoration
Kerr SE, Patwardhan A
University of Maryland College Park

P.74 Sensitivity Analysis on Resident Evacuation Behavior in the Integrated Scenario-based Evacuation (ISE) framework
Yang K, Davidson R, Nozick L, Brian B, Brian C, Wachtendorf T, Drasback K, DeYoung S, Kolar R, Yi W
University of Delaware

P.75 Modeling Homeowner Retrofit Behavior for Wind and Flood
Yahyazadeh Z, Davidson R, Trainor J, Kruse J, Nozick L
University of Maryland

P.76 Resource Adequacy Risks to the Bulk Power System in North America
Murphy SJ, Apt J, Sowell F
Carnegie Mellon University

P.77 Assessing the Risk of Wind Drought for Wind Farms
Schell K, Guikema SD, Pinson P
University of Michigan

P.78 Impact of Large-Magnitude Earthquakes on Structures in Deep Sedimentary Basins
Marafi N, Berman J, Eberhard M
University of Washington

Exposure Assessment

P.79 Public Health Implications of EPA's UCMR3 Sampling of Contaminants in Drinking Water
Greene CW, Suchomel AE
Minnesota Department of Health

P.80 Understanding Chemical Emission from In-Situ Water Pipe Repairs
Teimouri M, Ra K, Conkling E, Boor B, Howarter JA, Whelton AJ
Purdue University

P.81 Determining the Health Protective Capability of Analytical Detection Methods for Short Duration Exposures
Lipscomb JC, Willison S, Parry E, Chattopadhyay S, Snyder E
US EPA, National Homeland Security Research Center

P.82 Concentration of Cadmium in Spinach in U.S. Monitoring Data
Nyambok EO, Hoffman-Pennesi D, Gavelek A, Briguglio S, Spungen J, Wirtz MS
Oak Ridge Institute for Science and Education

P.83 Exposures to Styrene from Food Packaging under CA Proposition 65
Mattuck R, Dubé EM, Liu X, Greenberg GI
Gradient

P.84 Senior Toxicologist, Human Health Risk Assessment
Lopez TK
Tetra Tech

P.85 Inorganic Arsenic Exposures Associated with Consumption of Infant Rice Cereal
Chiger A, Lynch MT, Houlihan J
Abt Associates Inc., Healthy Babies Bright Futures

P.86 Risk Assessment of Exposure to Acrylamide from Baby Food in Taiwan
Lai TR, Huang YC, Chuang YC, Wu KY, Chiang SY
China Medical University

P.87 The Risk Assessment of Furan Residue in Commercial Baby Formula in Taiwan for Infants and Children Under Age of Three
Huang YC, Wu KY
National Taiwan University

P.88 Probabilistic Risk Assessment of Fipronil in Vegetables and Fruits in Taiwan.
Huang YC, Chuang YC, Wu KY, Chiang SY
Department of Public Health, China Medical University

P.89 Risk Assessment of Imported Canned Foods in Taiwan: Take Bisphenol A (BPA) as an Example
Hsiao IL, Wu KY
National Taiwan University

P.90 Risk Assessment of Arsenic in Prescriptions of Traditional Chinese Medicine.
Horng RL, Chuang YC, Hsiao JL, Lin YT, Wu KY, Chiang SY
China Medical University

P.91 Dietary Contaminant Exposure Estimates Should Reflect Risks to Sensitive Sub-Populations: A Case Study of Lead and Hot Tea Consumption in Persons of Reproductive Age Participating in NHANES 2013-2014
Guerrette ZN, Fleischer JG, Whittaker MH
ToxServices LLC

P.93 Human Health Exposure and Risk Assessment of Mercury in Camp 6, Benguet, Philippines
Diola MD, Resurreccion AC, Fujimura M
University of the Philippines Diliman, National Institute for Minamata Disease

P.94 State-of-the Art Consensus on How to Evaluate Bioavailability in Contaminated Soil: Guidance from ITRC
Ries D, Durant K, Sorrentino C
Interstate Technology and Regulatory Council, State Government

P.95 Impact of Industrial Activities Emissions on Mortality Rates in Chile: An Ecological Study
*Gutierrez W, Fortt A**
Universidad Diego Portales, GreenRiver

P.96 Use of Air Dispersion Modeling to Estimate Historical Community Exposure from Manufacturers of Asbestos-containing Products
Bare JL, Abramson MM, Barlow CA, Scott PK
Cardno ChemRisk

P.97 Human Exposure to Nine Flame Retardants in Indoor Environments
Patterson J, Chaisson C, Diskin K, Parker A, Babich M, Biggs MB
University of Cincinnati, formally Toxicology Excellence for Risk Assessment, The LifeLine Group, U.S. Consumer Product Safety Commission

P.98 VOC Exposures from Use of Aerosol Brake Cleaner
Williams PRD, Fries M, Ovesen J, Maier A
E Risk Sciences, LLP, University of Cincinnati College of Medicine

P.99 Study on Risk Assessment of Aloe-emodin for Taiwanese Population
Yen YT, Wu KY
National Taiwan University

P.100 Comprehensive Multipathway Risk Assessment of Chemicals Associated with Recycled
Lemay JC, Peterson MK, Pacheco Shubin SE, Prueitt RL
Gradient

P.101 Toxicological Risk Assessment of Toluene and Formaldehyde in a Consumer Product Packaging Material
Fleischer JG, Whittaker MH
ToxServices LLC

P.102 Mapping the Emissions Exposure Risk due to Hydraulic Fracturing in Pennsylvania
Banan Z, Gernand JM
Pennsylvania State University

P.103 Application of an Excel-based Toxicokinetic (TK) Model for Deriving Health-based Water Guidance for PFOS and PFOA.
Goeden HM, Greene CW, Jacobus JA
Minnesota Department of Health

P.104 Dynamical Systems Modeling of the Human Hypothalamic-Pituitary-Thyroid Axis: Developing Quantitative Adverse Outcome Pathways for Thyroid Endocrine Disruptors
Fueta PO, Zhang Q
Emory University

P.106 Development of an Indoor Consumer Exposure Assessment Tool (ICET) and Case Studies by Using ICET
Kajihara H, Higashino H
National Institute of Advanced Industrial Science and Technology (AIST)

P.107 Association Between Melanoma and Glioma Risk: A Nationwide Study in Taiwan
Chu YR, Yin MC, Chang PH, Luo RY, Ho WC, Il'yasova D
China Medical University

P.108 Air Quality Concerns Following Ocean Oil Spills
Rosenstein AB, French-McCay D, Rowe J
Lexington Environmental Risk Group LLC, RPS/ASA

Foundational Issues in Risk Analysis

P.109 Indirect Health Risk Reduction Through Transgenic Bt Corn
Yu J, Hennessy D, Wu F
Michigan State University

P.110 Risk Denial: Societal, Organizational and Cultural Perspectives
Merad MM
CNRS

P.111 Application of Principles of Failure Modes, Effects, and Criticality Analysis to Fluid Milk Food Safety Plan
Kottapalli B, Butler S, Peers M, Holzhueter D
ConAgra Brands

Microbial Risk Analysis

P.112 Applicability of Whole Genome Sequencing Data for Salmonella risk Assessment in Poultry Meat
Karanth S, Mishra A, Pradhan AK
University of Maryland College Park

P.113 Assessing Food Safety Risk of Toxoplasma Gondii in Muscle Tissues of Naturally Infected Meat Animals in the United States.
Rani S, Dubey JP, Pradhan AK
University of Maryland, USDA Animal Research Services

P.116 Horizontal Gene Transfer Under Dynamic System Conditions for Understanding Dose-Response Relationships for Antibiotic Resistance Risks
Chabrelie AE, Zhang L, Bornhorst G, Mitchell J
Michigan State University, University of California, Davis

P.117 PSCMT: A Supply Chain Model of Microbial Contamination Risk in Fresh Tomatoes
Zoellner C, Jackson P, Al-Mamun MA, Grohn YT, Worobo R
Cornell University

Occupational Health and Safety

P.118 Health Risk Assessment of Cadmium in Rice
*Kuen Yu Hwu JB, Lai Szu Chi **
Taiwan University

P.119 Risk Analysis and Patient Safety: A Tool for Improvement
Elmontsri M, Banarsee R, Azeem M
Imperial College London

P.120 Incorporating ToxCast and ExpoCast Data into Naphthalene Risk Assessment
Bailey LA, Rhomberg LR
Gradient

P.121 Incorporating Health Risk Assessment into Facility Layout and Process Design
Huang SH, Chuang YC, Wu KY
National Taiwan University

P.122 Integrating NIOSH Efforts to Protect Workers: Linking Cumulative Risk Assessment, Exposome, and Total Worker Health®
Dotson GS, Chosewood LC, Middendorf PJ
CDC, National Institute for Occupational Safety and Health

P.122.5 Recommendations for Sieving Soil and Dust Samples at Superfund Sites for Assessment of Incidental Ingestion Via Dermal Adherence
Stifelman M, Brown J, Lowney Y, Follansbee M, Diamond G, Burgess M*
SRC, Inc.

Other

P.123 A Risk by Any Other Name Would Not Smell As Sweet
Pace ND, Poole C
University of North Carolina at Chapel Hill

P.124 Comparing Verbal and Numeric Forecasts New Findings and Implications
Nguyen JD, John RJ
University of Southern California

P.125 Methodology for Policy Characterization Based on the Multiple Risk Evaluation Results: Case Study for Japanese Chemical Replacements
Kojima N, Xue M, Zhou L, Machimura T, Ebisudani M, Tokai A
Graduate School of Engineering, Osaka University

Risk and Development

P.128 Influence of Industrial Activities Emissions on Mortality Rates in Chile: An Ecological Study
Fortt A, Gutierrez W
Universidad Diego Portales, GreenRiver

P.129 Current and Emerging Human Health Impacts Associated with Land-Based Pollution in Low and Middle-Income Countries (LMICs): Data Gaps & Research Needs
Williams PRD, Meiro-Lorenzo M, Puech Fernandez MR, Kadeli LG
E Risk Sciences, LLP, World Bank

Risk Communication

P.130 The Social and Economic Effects of Environmental Contamination and Remediation
Zwickle A, Cox J, Hamm J, Zhuang J, Upham B, Dearing J
Michigan State University

P.132 Modeling Social Media Engagement Across the Disaster Continuum
Sutton J, Resnick S, Vos SC, Yu Y, Olson M, Butts SC
University of Kentucky

P.133 Engaging with human gene Editing: Public Views Toward Decision-making about Controversial Scientific Issues
Rose KM, Scheufele DA, Brossard D, Xenos MA
University of Wisconsin-Madison

P.135 What's Numbers Got to Do with It?: The Role of Statistical Content in Risk Perception about Road Saftey
Steinhardt JS
Michigan State University

P.136 Communicating Earthquake Preparedness
Marti M, Stauffacher M, Matthes J, Wiemer S
ETH Zürich

P.137 Testing Procedures to Mitigate Perceived Unfairness Perceptions Associated with Research-Related Conflicts of Interest
Besley JC, McCright AM, Zahry NR, Elliott NE, Martin JD, Kaminski NE
Michigan State University

P.138 Processing Risks: What Makes the U.S. Public Attend to Information about the 2016 Presidential Election vs. Climate Change
Yang J, Chu H
University at Buffalo

P.139 Media Representations of Water Issues as Health Risks
Boyd A, Mayeda A, Paveglio T, Flint C
Washington State University

P.140 Comparison of Risk Perception Among Thirty Risk Factors in Japan
Ohkubo C
Japan EMF Information Center

P.143 Up and Down in the Cycle: The Effects of Media Attention on the Political Debate and Policy on the Public Risk of Earthquakes
Opperhuizen AE, Schouten KIM, Klijn EH
Erasmus University Rotterdam

P.145 Forecasting Barriers to Wide Scale Adoption of Self-Driving Car Technology
Dixon GN, Hart PS, Clarke CE, O'Donnell N
The Ohio State University

P.146 News Media Framing of the Risk of Induced Seismicity in Four U.S. States
Lambert CE, McComas KA
Cornell University

P.149 The Effect of Gain vs. Loss Message Framing and Spatial Distance on Influencing Support for Aquaculture Among U.S. Seafood Consumers
*Rickard LN, Kumara SMSP**
University of Maine

P.150 The Role of Science News Sources in Shaping Risk Perceptions of Agricultural Use of Pesticides
*Li N, Powers R**
Texas Tech University

P.152 Food Fraud and Consumer Risk Perception in Quebec (Canada)
De Marcellis-Warin N, Peignier I
Ecole Polytechnique de Montreal

P.153 Risk Perceptions of Lone-Wolf Terrorist Threats and Policy Preferences for Government Counterterrorism Spending: Evidence from a U.S. National Panel Survey
Liu X, Mumpower JL, Portney KE, Vedlitz A*
Texas A&M University

P.154 Who Moved My Coffee? Using Psychological Distance to Frame Climate Change Impacts
Chu H, Yang J
University at Buffalo, State University of New York

P.155 Perception and Acceptance of HPV Vaccination: Evaluating The Impacts of Message Framing, Motivation, Cultural Cognition and Gender in a Cross-country Context
Liu S, Yang J
University at Buffalo, State University of New York

P.156 The Influence of Narrative and participatory Drama on Social Interaction and Efficacy Around Health and Environmental Issues in Malawi
Young CE, McComas KA
Cornell University

P.158 Perceptions of Risk and Uncertainty in Climate-adaptive Forestry
Findlater KM, Peterson St-Laurent G, Hagerman S, Kozak R
University of British Columbia

P.159 The Salience of Environmental Hazards: Making Sense of Citizen Concerns and Their Implications for Risk Communication
Binder AR
North Carolina State University

P.160 Current Situation of Emergency and Long-term Responses on Community Risks by Chemical Accidents
Murayama TM, Imanaka IA, Nishikizawa NS, Nagaoka NA
Tokyo Institute of Technology

P.162 The Impact of Advocacy by Scientists on Credibility and Citizens' Deference on Specific Issues
Stenhouse N, Vraga E, Myers T, Kotcher J, Beall L, Maibach E
University of Wisconsin-Madison

Security and Defense

P.165 Thematic Mapping of Cyber Security and Cyber Security Risk: Expert Elicitation of Researchers and Practitioners
Taber DL, King ZM, Cains MG, Henshel DS
Indiana University

P.166 Hazard Assessment of Ethylbenzene for Potential Impacts to National Defense
Rak A, Vogel CM, Bandolin N
Noblis, US Army Public Health Center

P.167 National Academies Decadal Survey of Social and Behavioral Sciences for National Security
*Bhatt S, Schuck JA**
National Academies of Sciences, Engineering, and Medicine

P.168 The Risk Assessment of Pesticide Residue, Fluopyram, in Tea in Taiwan
Huang J, Wu KY
National Taiwan University

Current Events/Works in Progress

P.171 Biphasic Low-Dose Patterns of Inhibition-Activation for Three Nuclear Receptors Linked to Suppressed Apoptosis, Cell Proliferation, and Tumorigenesis: HSP70, Nrf2, and CAR
Bogen KT
Exponent, Inc., Health Sciences

P.172 Applying A Global Sensitivity Analysis Workflow to Improve Computational Efficiency in Physiologically-Based Pharmacokinetic Model
Hsieh NH, Reisfeld B, Bois FY, Weihsueh WA
Department of Veterinary Integrative Biosciences, Texas A&M University

P.173 Physiologically Based Pharmacokinetic (PBPK) Modeling of Interstrain Variability in Perchloroethylene Metabolism in Mice
Dalaijamts C, Cichocki JA, Luo YS, Rusyn I, Chiu WA
Texas A&M University

P.174 Assessing the Risk of Maritime Accidents
Large PJ, Zouhair F
U.S. Coast Guard

P.175 Field Evaluations of Newly Available "Interference-free" O3 Monitors and 2-10 meter near-ground O3 gradients
Ollison WM, Leston AR
American Petroleum Institute and AirQuality Research & Logistics, LLC

P.176 A Review of Non-Chemical Stressors and Their Importance in Cumulative Risk Assessment
Hibbert K, Tulve NS
U.S. Environmental Protection Agency

P.177 Framework for Managing Risks under Ontario's Local Air Quality Regulation
Gilmore J, Jugloff D, Onica T, Grant C, Schroeder J
Ontario Ministry of Environment and Climate Change

P.178 Evaluation of ACGIH TLVs for Toluene Diisocyanate
Goodman JE, Lynch HN, Prueitt RL, Mohar I
Gradient

P.179 Science in the News: The Politicization of Fracking
McClaran N
Michigan State University

P.180 Risk Assessment Guidance for Enzyme-containing Products
Kruszewski FH
American Cleaning Institute

P.181 Application of Livestock Shipment Models to Address Regional Risk of Disease Spread and Detection
Hallman CN, Portacci K, Miller RS, Sellman S, Brommesson P, Beck-Johnson L, McKee C, Gorsich E, Tsao K, Tildesley M, Wennergren U, Lindström T, Webb C
U.S. Department of Agriculture, Linkoping University, Colorado State University, University of Warwick

P.182 A Game-Theoretic Approach to Attacker-Defender Interaction in Cyber Systems
Outkin AV, Eames BK, Jones ST, Vugrin ED, Walsh S, Phillips CA, Hobbs JA, Galiardi M, Wyss GD
Sandia National Laboratories

P.183 Application of a 3-D Chemical Fate Prediction Model for Risk Assessment of Agricultural Chemicals in Japanese River Water
Kobayashi N, Komatsubara Y, Eriguchi T, Ikarashi Y
National Instutute of Health Sciences

P.184 Effect of Risk Probability Disclosure on System Reliability: An Economic Experiment
Akai K, Makino R, Takeshita J, Kudo T, Aoki K
Shimane University

10:30 AM – 12:00 PM

Salon A

T2-A Roundtable: Principles, Methods, and Standards for Benefit-Cost Analysis in Low- and Middle-Income Countries

Chair: Lisa Robinson

Foundations, international organizations, government agencies and others are interested in investing to improve the well-being of populations in low- and middle-income countries. However, choosing which initiatives to fund and what level of resources to devote to each involves difficult choices. If well-conducted, benefit-cost analysis provides important and useful information to support these decisions.

To increase the comparability of these analyses, improve their quality, and expand their use, the Bill and Melinda Gates Foundation is supporting the development of guidelines for economic evaluation (https://sites.sph.harvard.edu/bcaguidelines/). These guidelines are designed to encourage completion of high-quality, transparent, and consistent evaluations that address the needs of decision-makers and other stakeholders.

This session provides an opportunity to learn more about the development of these guidelines and to offer feedback on their content, aiding in shaping the ultimate recommendations. We will provide an overview of the project and summarize our work to-date, then discuss selected methodological topics in more detail. These include draft recommendations for valuing reductions in fatal and nonfatal risks and for using economy-wide (computable general equilibrium) models to estimate impacts. The final recommendations will ultimately be incorporated into easy-to-use, step-by-step guidance. After brief presentations and comments from discussants, we will allow substantial time for feedback from the audience.

Panelists:
Lisa A. Robinson and James K. Hammitt (Harvard Center for Health Decision Science and Center for Risk Analysis), James E. Neumann (Industrial Economics, Incorporated), Maureen Cropper (University of Maryland), Chris Dockins (U.S. Environmental Protection Agency), Urvashi Narain (The World Bank), and Sandra Hoffmann (U.S. Department of Agriculture)

Sponsored by:
Economics and Benefits Analysis Specialty Group and Society for Benefit-Cost Analysis

10:30 AM – 12:00 PM

Salon B

T2-B Roundtable: Communicating about Risk: Why Doesn't Scientific Evidence Convince People and Political Leaders?

Co-chairs: Chuck Haas, Sharon Friedman

Victor Hugo once said: "Science says the first word on everything, and the last word on nothing." While many factors influence how citizens and political leaders respond to controversial risk issues, why is it that scientific evidence is often downplayed or even disbelieved by many? Examples of such risk issues include climate change, childhood vaccines, genetically modified foods and nuclear waste, among many others. The paradox of Americans saying in public opinion polls that they have a great deal of confidence in science while intensely questioning scientific evidence, led to a recent newspaper headline: "People trust science. So why don't they believe it?" Perhaps some of the answers lie in the complex risk communication patterns that evolve around controversial scientific issues, including conflicting roles played by scientists and scientific societies, the mass and social media, government officials, and lobbying and nonprofit organizations. This roundtable proposes to explore various issues related to communicating about scientific evidence and risks. Can scientific evidence about risks provide rapid and timely responses to important risk questions as they arise in the public? Does engaging the public directly in town halls, science juries or other events facilitate better acceptance of risk science? Can scientific uncertainty be presented to the public as an acceptable response, particularly when evidence is changing rapidly? Can risk evidence be presented without also presenting a point of view? Is there any form of risk communication that can overcome deeply held public views about a risk controversy?

Panelists:
Sharon Friedman, George Gray, Michael Greenberg, Roger Kasperson, Katherine McComas and Kim Thompson.

Sponsored by:
Risk Communication Specialty Group

10:30 AM – 12:00 PM

Salon C

T2-C Symposium: Perspectives on Synthetic Biology

Chair: Benjamin Trump

10:30 AM **T2-C.1**
Published Literature and Communities of Practice for Synthetic Biology
Trump BD, Cegan J, Poinsatte-Jones K, Wells E, Wood M, Rycroft T, Warner C, Linkov I
US Army Corps of Engineers

10:50 AM **T2-C.2**
Secondary Risks of Vaccine
Cummings CL
Nanyang Technological University, Singapore

11:10 AM **T2-C.3**
Comparative Review of the Environmental Effects of Biofuels
Wells E, Trump BD, Linkov I
US Army Corps of Engineers - Risk and Decision Science Team

11:30 AM **T2-C.4**
High Risk, High Reward: The Role of Ambivalence in Perceptions of Nanotechnology and Synthetic Biology
Wirz CD, Howell EL, Brossard D, Scheufele DA, Xenos MA
University of Wisconsin-Madison

Sponsored by:
Decision Analysis and Risk Specialty Group

10:30 AM – 12:00 PM

Salon D

T2-D Symposium: Using Risk Analysis to Address the Needs of Migrants and the Challenges of Migration: Is it Happening?

Chair: Frederic Bouder

10:30 AM **T2-D.1**
The Vaccines We Want: Perception and Expectations of Syrian Refugees in the Netherlands
Bouder F, Strijbosch K
Maastricht University

10:50 AM **T2-D.2**
Frontex Risk Analysis: A Tool for Integrated Border Management in Europe?
Paul R
Minda de Gunzburg Center for European Studies Harvard/Law and Society Unit Bielefeld University

11:10 AM **T2-D.3**
Evacuation Following a Natural Disaster Versus Migration to Escape Armed Conflict - What May Be the Impact on Children and Young Adults?
Rath B, Myles P
The Vienna Vaccine Safety Initiative, The University of Nottingham

11:30 AM **T2-D.4**
Assessment of Health-related Risk Factors in Internally Displaced Person Populations Living in Camp Settings in Nigeria
Ekezie W, Timmons S, Siebert P, Myles P, Pritchard C, Bains M
University of Nottingham, United Kingdom

Sponsored by:
Risk, Policy and Law Specialty Group

10:30 AM – 12:10 PM

Salon E

T2-E Defense and Policy

Chair: Debra Decker

10:30 AM **T2-E.1**
A System of Systems Approach to Layered Security at a Foward Operating Base
Hoffman M, Turnley J, Wachtel A, Speed A, Gauthier J, Muñoz-Ramos K, Kittinger R
Sandia National Laboratories, Galisteo Consulting Group Inc.

10:50 AM **T2-E.2**
Emotion and Individual Reasoning About Exclusively Negative Risks: Public Responses to a Military Crisis Between the U.S. and North Korea
Ripberger JT, Gupta K, Jenkins-Smith H, Silva C
University of Oklahoma

11:10 AM **T2-E.3**
Risk Governance for Security: International Challenges for the Nuclear Sector
Decker DK
Stimson Center

11:30 AM **T2-E.4**
Inconvenient Truths: When Risks Aren't as Severe as You Would Like
Rouse JR
Arete Associates, The Joint Staff

11:50 AM **T2-E.5**
Exploring Optimal Risk-Based Strategies for Medical Countermeasure (MCM) Stockpiles
Hartnett E, Payette P, Paoli G
Risk Sciences International

Sponsored by:
Security and Defense Specialty Group

10:30 AM – 12:00 PM

Salon FG

T2-F Symposium: Engineering and Modeling of Resilience

Chair: Hiba Baroud

10:30 AM **T2-F.1**
Emergence of Antifragility by Optimum Postdisruption Restoration Planning of Infrastructure Networks
*Fang Y, Sansavini G**
ETH Zürich

10:50 AM **T2-F.2**
Metrics for Resilience: What Are We Really Measuring?
MacKenzie CA
Iowa State University

11:10 AM **T2-F.3**
Measuring Community Recovery Rate with Sparse Data: A Comparison of Multiple Approaches
Yu J, Baroud H
Vanderbilt University

11:30 AM **T2-F.4**
An Indicator-Based Assessment of Community Resilience to Failure of Flood Protection Infrastructure
Gillespie-Marthaler L, Camp J, Baroud H, Abkowitz M
Vanderbilt University

Sponsored by:
Engineering and Infrastructure Specialty Group

10:30 AM – 12:00 PM

Salon H

T2-G Applied Risk Management: Risk Culture, Risk Values, and Compliance

Chair: Patricia Larkin

10:30 AM **T2-G.1**
Investigating the Evolution of risk Culture in Disparate Fields
Schell MC, Schell KR, Abdulla A
University of Rochester, University of Michigan, Ann Arbor, University of California, San Diego

10:50 AM **T2-G.2**
Risk Governance and "Responsible Research and Innovation"
*Florin MV, Van de Poel I**
TU Delft

11:10 AM **T2-G.3**
Helping Make Green New Zealand Even Greener: The Challenges and Rewards of a Regulator Sharing Its Risk Assessment Methodology
Bailey LB, Bromfield KE, Corin C, Holmes G
New Zealand Environmental Protection Authority

11:30 AM **T2-G.4**
On the Relation Between Safety Outcomes and Regulatory Compliance
Wiersma RP
Technical Standards and Safety Authority

Sponsored by:
Applied Risk Management Specialty Group

10:30 AM – 12:00 PM

Salon J

T2-H Risk-Informed Priority Setting: Methods and Challenges

Co-chairs: Amir Mokhtari, David Oryang

10:30 AM **T2-H.1**
Developing and Using Decision Analysis Tools for the FDA Foods Program – A Decade of Continual Improvement
Oryang DO, Fanaselle W, Van Doren J, Dennis S
CFSAN, FDA

10:50 AM **T2-H.2**
A Performance-Based Method for Microbial Risk Assessment for Organizations
McClellan GE, Coleman ME
Applied Research Associates, Inc.

11:10 AM **T2-H.3**
Source Attribution at the Sub-product Level for 32 Pathogen-commodity Combinations for the development of the Canadian Food Inspection Agency Establishment-based Risk Assessment Model
Zanabria R, Racicot M, Leroux A, Arsenault J, Ferrouillet C, Griffiths M, Holley R, Gill T, Charlebois S, Quessy S
Canadian Food Inspection Agency

11:30 AM **T2-H.4**
Methodological Lessons Learnt from Developing a Risk-benefit Assessment Applied to Infant Milk-based Diet
Boué G, Cummins E, Guillou S, Antignac JP, Le Bizec B, Membré JM
Oniris / INRA

Sponsored by:
Microbial Risk Analysis Specialty Group

10:30 AM – 12:00 PM

Salon K

T2-I New Models for Dose-Response

Chair: Allen Davis

10:30 AM **T2-I.1**
Rat and Human PBPK Model for Malathion: Application for Risk Assessment
Reiss R, Loccisano A, Whatling P, Wang W
Exponent, FMC Corporation

10:50 AM **T2-I.2**
Assessing Uncertainty and Variability in Biochemical Parameters in a PBTK Model for Perchlorate
Kapraun DF, Schlosser PM
US Environmental Protection Agency

11:10 AM **T2-I.3**
Dose-Response Assessment of Arsenic in Drinking Water: A Bayesian Network Model of Diabetes Risks
MacDonald-Gibson J, Zabinski J
University of North Carolina at Chapel Hill

11:30 AM **T2-I.4**
Impact of Generalized Informative Prior on BMD Estimation Using Dichotomous Data
Shao K
Indiana University

Sponsored by:
Dose Response Specialty Group

10:30 AM – 12:00 PM

Salon 1

T2-J Symposium: U.S. National Security Interests and Transnational Security Decision Making

Chair: James Baker

10:30 AM **T2-J.1**
Confronting the Collapse of Humanitarian Values in Foreign Policy Decision Making
Slovic P
Decision Research, University of Oregon

10:50 AM **T2-J.2**
Overcoming the Prominence Effect in Transnational Security Decisions
Delaney D
University of Maryland Center for Health and Homeland Security, Carey School of Law

11:10 AM **T2-J.3**
Behavioral Considerations in Context: Crisis Decision Making by Senior Public Officials
Baker JE
ABA Standing Committee on Law and National Security

11:30 AM **T2-J.4**
A Public Choice Perspective on Behavioral Approaches to National Security Decision Making
Stearns M
University of Maryland Carey School of Law

Sponsored by:
Risk Policy and Law Specialty Group

10:30 AM – 12:00 PM

Salon 2

T2-K Roundtable: Understanding Perceptions of Benefits and Risks Posed by Microbiota of Milks

Co-chairs: Ann Bostrom, Warner North

Regulators and stakeholders around the world differ in their perceptions of risks and benefits of fresh unprocessed milks (human and bovine) and pasteurized milks. A joint SRA RO project began outreach documenting the state of the science on the microbiota of milks and engaging in dialogue with SRA practitioners and other stakeholders through a webinar series (podcasts, slide sets available). Two SRA Past-Presidents will moderate discussions of the evidence for risks and benefits of fresh unprocessed mother's milk to infants, including a key study demonstrates loss of benefits for neonates in NICU environments that ingest Holder pasteurized donor milk. The moderators and panelists will discuss rationales for and against pasteurization in light of an emerging dimension: the microbiota of milks. Discussions will be grounded in the major elements of risk communication (trust, fairness, and emotionality). Various risk communication approaches (evidence mapping, mental modeling) will be considered. Also of keen interest is evidence for risks and benefits of fresh unprocessed bovine milk for consumers, including children and adults. Evidence mentioned in the symposium for human milks will be included, along with additional evidence for bovine milks, in exercises of analytic-deliberative process in the next phase of this multi-year joint RO project (a 2.5-day stand-alone SRA workshop in 2018). Participants in the symposium will discuss what is known about the healthy human milk microbiome, research gaps, researchable questions, and potential improvements in developing evidence-based policies and risk communications.

Panelists:
Cynthia Bearer, U MD Medical School (Chief of Neonatology/Associate Chair for Research); Peg Coleman, Upstate NY SRA (microbiology/microbial risks and benefits); Bill Hallman, Rutgers University (risk communication/food safety); Ellen Silbergeld, Johns Hopkins Bloomberg School of Public Health (health/environmental policy); Tanya Soboleva, Australia/New Zealand SRA (food science/risk assessment)

Scope and Structure of Round Table Panel Discussions
The focus for the round table panel symposium is on evidence for risks and benefits from fresh unprocessed and pasteurized human milks for infants (NICU and others). Input will be sought on the state of the evidence and key researchable questions necessary to inform future decision making for human donor milk in this phase of the project, and for bovine milk in the next stage of the project, the 2018 workshop.

Sponsored by:
Risk Communication Specialty Group

1:30 PM – 3:00 PM

Salon A

T3-A Symposium: New Perspectives on the Energy Paradox

Chair: Randall Lutter

1:30 PM **T3-A.1**
Assessing the Energy Paradox in Reasonably Competitive Markets: New Evidence from Heavy Duty Trucking
Fraas A, Lutter R, Wietelman D, Porter Z, Wallace A
Resources for the Future

1:50 PM **T3-A.2**
Assessing the Risk of Product Failure in Regulatory Analysis: Case Studies from Energy Efficiency Lawsuits
*Fraas AG, Miller SE**
George Washington University

2:10 PM **T3-A.3**
How Much Do New Vehicle Consumers Value Fuel Economy and Performance? Evidence from Technology Adoption
Leard B, Linn J, Zhou YC*
Resources for the Future

2:30 PM **T3-A.4**
Are Auto Consumers Rational about Conventional Hybrids?
Graham JD, Julian AA, Kin Lu A, Duncan D, Siddiki S, Carley S
Indiana University

Sponsored by:
Economics and Benefits Analysis Specialty Group and Society for Benefit-Cost Analysis

1:30 PM – 3:00 PM

Salon B

T3-B Roundtable: Scientific and Public Understanding of Risk: The Role of Social Sciences

Chair: Andreas Klinke

Over the last two decades, the prevailing techno-scientific culture in risk analysis, assuming that natural-scientific and technical experts are capable of determining mathematically the probability of occurrence, a measure of potential damages and an estimate of the consequences of risks of all sorts, has changed towards a better integration of social sciences in risk research. A forthcoming special issue of Risk Analysis that will be published in 2018 is investigating the role of particular areas of social sciences on risk research – such as perception, communication, trust, social amplification, media, organizational structures, governance, and so on – by reconstructing and critically reflecting the genealogy as well as the present and future development in particular areas of social science inquiry from their point of view. The social science perspective has transformed the thinking about risk and uncertainty; it has illuminated the explanatory power and infused interdisciplinary risk research and real world risk management. Far from being merely a social science accommodation to traditional risk analysis, the social science theories, concepts, analytical approaches and methods create something new and innovative by crossing boundaries and providing a surplus for the scientific and public understanding of risk. The Round Table will give authors of contributions in the special issue the opportunity to distill key developments of social science inquiry in risk research and discuss with the audience the following questions: How do social sciences contribute to the foundations of risk analysis? How do social sciences contribute to a better scientific and public understanding of risk? Is there an increasing tendency towards more interdisciplinary inquiry that goes beyond multi-disciplinarity? Where are still shortcomings in terms of an integration of natural, technological and social sciences in risk research?

Panelists:
Sharon Friedman, Robert Goble, Roger Kasperson, Kenneth Arne Pettersen, Terje Aven,Micheal Siegrist, Jeannette Sutton

Sponsored by:
Foundational Issues in Risk Analysis Specialty Group

1:30 PM – 3:00 PM

Salon C

T3-C Symposium: Advances in Probability Assessment for Risk Analysis

Chair: Richard John

1:30 PM **T3-C.1**
Quantifying the Accuracy of Subjective Probability Estimates: A Meta-Analysis
Baucum M, Nguyen K
University of Southern California

1:50 PM **T3-C.2**
Comparing Verbal and Numeric Forecasts New Findings and Implications
Nguyen KD, John RJ
University of Southern California

2:10 PM **T3-C.3**
How to Debias Overprecision in Probability Elicitations?
Ferretti V, Guney S, Montibeller G, Von Winterfeldt D*
Loughborough University

2:30 PM **T3-C.4**
Contingency, Causality, and Risk
John RS, Baucum M
University of Southern California

Sponsored by:
Decision Analysis and Risk Specialty Group

1:30 PM – 3:00 PM

Salon D

T3-D Cumulative Risk Assessment

Chair: Kristen Spicer

1:30 PM **T3-D.1**
Implications of Applying Cumulative Risk Assessments to the Workplace
Fox MA, Spicer KE, Susi P, Chosewood LC, Johns DO, Dotson GS*
Johns Hopkins University, Murray State University, Avanti Industrial Hygiene, The National Institute for Occupational Safety and Health

1:50 PM **T3-D.2**
A Prelude to a Cumulative Risk Assessment: Qualitative Analysis of Work-Related Asthma among Healthcare Workers
Johns DO, Virji MA, Park JH, MacDonell MM, Cox-Ganser JM
Centers for Disease Control and Prevention, Argonne National Laboratory

2:10 PM **T3-D.3**
Exploring Categorical Occupational Exposure Limits with a Quantitative Framework to Group Nanoscale and Microscale Particles by Hazard Potency
Drew NM, Kuempel ED, Pei Y, Yang F
National Institute for Occupational Safety and Health

2:30 PM **T3-D.4**
Why Many Field-based Toxicity Thresholds are Unreliable: Statistical Artifacts Affecting Causal Inference
Kashuba RO, Menzie CA, Buonagurio JE
Exponent

Sponsored by:
Occupational Health and Safety and Dose Response Specialty Groups

1:30 PM – 3:00 PM

Salon E

T3-E Symposium: Conflict Scenarios and Global Catastrophic Risks

Chair: Anthony Barrett

1:30 PM **T3-E.1**
High Risk Scenarios of Gene Drives in Ecosystems
Kuzma J
NC State University

1:50 PM **T3-E.2**
Does the Nuclear Balance Matter?
*Pinelis J, Scouras J, Slavinsky I**
Johns Hopkins University Applied Physics Laboratory

2:10 PM **T3-E.3**
Socio-economic Challenges and Conflict for Climate Scenarios for Sub-Saharan Africa
Schweizer VJ, Mitchell RE
University of Waterloo

2:30 PM **T3-E.4**
Has the Advent of Nuclear Weapons Saved Lives?
*Toton E, Scouras J, Ice L**
Johns Hopkins University

Sponsored by:
Security and Defense Specialty Group

1:30 PM – 3:00 PM

Salon FG

T3-F Symposium: An Interdisciplinary Analysis of Multiple Risks and Lessons Learned from Flint, Michigan

Chair: Jade Mitchell

1:30 PM **T3-F.1**
Lessons Learned from Flint about the Operation and Resilience of Water Treatment Infrastructure
Masten SJ, McElmurry S, Davies SH
Michigan State University, Wayne State University

1:50 PM **T3-F.2**
Links Between Physical and Chemical Water Quality, Reported Incidence of Legionnaires' Disease, and Waterborne Legionella Pneumophila in Flint, Michigan
Garner E, Rhoads WJ, Edwards MA, Pruden A
Virginia Tech

2:10 PM **T3-F.3**
Institutional Failure as a Risk Factor
Beecher JA
Michigan State University

2:30 PM **T3-F.4**
Discussion of Lessons Learned from Flint about Risk Assumptions in the Lead and Copper Rule
*Feighner B, Mitchell JB**
Michigan Department of Environmental Quality, Michigan State University

Sponsored by:
Engineering and Infrastructure Specialty Group

1:30 PM – 3:00 PM

Salon H

T3-G Applied Risk Management: Integrated Risk Management, Systemic and Cascading Risks

Chair: Myriam Merad

1:30 PM **T3-G.1**
How Can Organisations Deal with Systemic Risks?
Florin MV, Pfeiffer S
IRGC, EPFL

1:50 PM **T3-G.2**
An Argument and Methods for Integrated Risk Assessment for Decision Support
Ramsey BA, Wilson JM, Smith KL, Norton RA
Desert Research Institute, UNR, Auburn University

2:10 PM **T3-G.3**
Perspectives on Risk Assessment and Risk Management for Carbon Capture and Storage
Larkin P, Leiss W, Arvai J, Dusseault M, Gracie R, Fall M, Heyes A, Krewski D
University of Ottawa

2:30 PM **T3-G.4**
Risk-based Analyses of a hypothetical Expansion in the Scope of the U.S. Nuclear Regulatory Commission Safety Goal Policy for Nuclear Power Plants
Hudson DW
Johns Hopkins University

Sponsored by:
Applied Risk Management Specialty Group

1:30 PM – 3:00 PM

Salon J

T3-H Modeling Transmission of Microbial Contaminants in Poultry, Meat and Beyond

Co-chairs: Moez Sanaa, Abhinav Mishra

1:30 PM **T3-H.1**
Cross-contamination of Broiler Chickens with Campylobacter During Transport
Otten A, Ernst N, Ng V, Smith BA, Fazil A
Public Health Agency of Canada

1:50 PM **T3-H.2**
Ordinal QMRA to Prioritize Pork Products that May Contribute to Foodborne Hepatitis E Virus Transmission
Bouwknegt M, Van't Hooft BJ, Koppen K, Rietveld H, Straatsma G, Heres L
Vion, Boxtel, Stegeman, Deventer, Dutch Meat Products Association, Zoetermeer, Zwanenberg, Almelo, Sonac, Son

2:10 PM **T3-H.3**
Risk Assessment for Transfusion Transmission of Dengue
Huang Y, Lane C, Rios M, Fares-Gusmao R, Chancey C, Forshee R, Yang H
Food and Drug Administration

2:30 PM **T3-H.4**
Assessing the Impact of Different Microbiological Criteria for Salmonella in Raw Poultry Products
Lambertini E, Kowalcyk BB, Ruzante JM
RTI International

Sponsored by:
Microbial Risk Analysis Specialty Group

1:30 PM – 3:00 PM

Salon K

T3-I Symposium: The Life Cycle-Human Exposure Model (LC-HEM) Project: Research on Sentinel and Aggregate Chemical Exposures from Use of Consumer Products

Chair: Paul Price

1:30 PM **T3-I.1**
Developing a Rich Definition of the Person/Residence to Support Person-oriented Models of Consumer Product Usage
Price PS, Glen WG, Hubbard HF, Isaacs KK, Dionisio KL
US Environmental Protection Agency

1:50 PM **T3-I.2**
Human Exposure Model (HEM): A Modular, Web-based Application to Characterize Near-field Chemical Exposures and Releases
Dionisio KL, Isaacs KK, Phillips K, Lyons D, Brandon N, Levasseur J, Hubbard H, Vallero D, Egeghy P, Price PS
Environmental Protection Agency

2:10 PM **T3-I.3**
Predicting Exposure to Consumer-Products Using Agent-Based Models Embedded with Needs-Based Artificial Intelligence and Empirically -Based Scheduling Models
Brandon NV, Price PS, Dionisio KL, Isaacs KK
US Environmental Protection Agency

2:30 PM **T3-I.4**
Leveraging Publicly-Available Consumer Product and Chemical Data in Support of Exposure Modeling
Isaacs KK, Dionisio KL, Phillips KA, Price PS
United States Environmental Protection Agency

Sponsored by:
Exposure Assessment Specialty Group

1:30 PM – 3:00 PM

Salon 1

T3-J Roundtable: What is the Optimal Approach to Organizing Governmental Risk-Related Science Advisory Processes

Chair: Bernard Goldstein

Recent activities by both Congress and by EPA Administrator Pruitt provide an opportunity to evaluate approaches for organizing risk-related scientific advisory processes for regulatory agencies. The EPA Science Advisory Board Reform Act has been passed by the US House of Representatives and is awaiting action in the US Senate, which may or may or may not be forthcoming. These have generated media interest and controversy and some have characterized these actions as unnecessarily politicizing science and decreasing the likelihood of the involvement of knowledgeable academic scientists in EPA review processes. Others have pointed out that there is a need to broaden scientific representation in diverse fields, and to improve procedures for balancing perspectives and perceived biases on EPA scientific advisory panels. The Roundtable participants will be asked to focus on the underlying principles that should guide the science advisory processes for the optimal provision of scientific advice on risk-related issues to a regulatory agency.

Panelists:
Arvai J, Beck N, Denison RA, Goldstein BD, White KW, Yosie T

Sponsored by:
Risk Policy and Law Specialty Group

1:30 PM – 3:10 PM

Salon 2

T3-K New Developments in Risk Perception and Risk Communication Theory

Chair: Christopher Clarke

1:30 PM **T3-K.1**
Measuring Risk Perception: Is There a Right Way?
Wilson RS, Zwickle A
The Ohio State University

1:50 PM **T3-K.2**
Public Concern About Risk: A Critical (Re)Evaluation
Barnett J, Fellenor J
University of Bath

2:10 PM **T3-K.3**
Fighting Risk with Risk: An Exploration of Attitudes Towards Inter-domain Risk Tradeoffs
Walpole HW, Wilson RS
The Ohio State University

2:30 PM **T3-K.4**
Development and Validation of Novel Scales to Measures Cultural Worldviews in the UK
Lord JJ, Whitmarsh L, Poortinga W
Cardiff University

2:50 PM **T3-K.5**
The Effects of Construal Level on Perceptions of Climate-exacerbated Hazards
Walpole EH, Wilson RS, Toman E
The Ohio State University

Sponsored by:
Risk Communications Specialty Group

3:30 PM – 5:10 PM

Salon A

T4-A Benefit-Cost Analysis of Complex Systems

Chair: Amber Jessup

3:30 PM **T4-A.1**
Benefit Cost Analysis of Enabling Regulations: Insights from FAA's Small UAS Rule
Aiken DV, Wharff J
U.S. Department of Transportation

3:50 PM **T4-A.2**
Nuclear Energy Economics: Valuing Strategic Security
Decker D
Stimson Center

4:10 PM **T4-A.3**
Cybersecurity Investment as a Differential Game
*Alexeev A, Jardine E, Krutilla K**
Indiana University, Virginia Tech

4:30 PM **T4-A.4**
EPR for Plastics Packaging: Does It Make Sense to Distinguish Among Plastics Types?
Cabrera C, Cifuentes LA
Pontificia Universidad Católica de Chile

4:50 PM **T4-A.5**
Burden of Disease for CDC-recognized Urgent Threats: Clostridium Difficile, Carbapenem-resistant Enterobacteriaceae, and Drug-resistant Neisseria Gonorrheae Infections
Sertkaya A, Wong H, Jessup A, Ertis D
Eastern Research Group, Inc.

Sponsored by:
Economics and Benefits Analysis Specialty Group and Society for Benefit-Cost Analysis

3:30 PM – 5:00 PM

Salon B

T4-B Roundtable: Developing Guidelines for Each Domain of Risk Management Practice

Chair: John Lathrop

The Applied Risk Management Specialty Group is writing a document: Principles and Guidelines for Analytic Support of Risk Management. That document is intended as a vehicle for broad discussion and conclusions, with a goal of defining a consistent set of principles and guidelines that applies across all areas of SRA. Last year we focused on principles, this year we focus on guidelines. We have identified 16 domains of application and 21 challenges to be addressed in each of those domains. Some of the challenges: Capturing the risk generating process; characterizing the risk event space; reducing data down to effective decision guidance in a valid and reviewable way; assessing the uncertainties and validly taking them into account in risk management; considering scenarios "not on the list"; developing robust and resilient strategies; setting an adequate budget; validly choosing among alternative analyses; adversary modeling where it applies; data availability and collection; data validation; data management; data QA/QC; model validation; model documentation; and effective communication/advice into the actual risk management decision process. We can't do an adequate job in all 16 domains, so we are initiating a process where we cover as many domains as we can, then invite others to participate in extending our work to other domains. The writing of the document will span multiple years. We will conduct this roundtable as a working session, to acquire as many ideas as we can from all participants. The panelists will each pose key dilemmas and challenges we have encountered in developing guidelines, then call for ideas and arguments from everyone in the room. One of our underlying agendas is to enlist others in our writing effort, in particular SRA members outside of our Specialty Group.

Panelists:
Patricia Larkin, Willy Roed, Rob Waller, Seth Guikema

Sponsored by:
Applied Risk Management Specialty Group

3:30 PM – 5:10 PM

Salon C

T4-C Symposium: GIS-Aided Decision Tools for Managing Environmental Risks and Disasters

Chair: Sheree Pagsuyoin

3:30 PM **T4-C.1**
Workforce, Economy, Infrastructure, Geography, Hierarchy, and Time (WEIGHT): Reflections on the Plural Dimensions of Disaster Resilience
Santos JR, Yip C, Pagsuyoin S, Thekdi S
George Washington University

3:50 PM **T4-C.2**
Risk-based Decisions and Strategies for Geospatial Multi-network Resilience
Thekdi S, Aros-Vera F
University of Richmond

4:10 PM **T4-C.3**
Ecological Risk Assessment of Heavy Metals in Soil, Water and River Sediments in and around Bued River
Diola MBLD, Resurreccion AC, Bautista CC, Quiocho RE*
University of the Philippines Diliman

4:30 PM **T4-C.4**
Spatio-Temporal Drought Risk Analysis Using GIS-based Input Output Modeling
Pagsuyoin SA, Santos JR, Salcedo G, Yip C
University of Massachusetts Lowell

4:50 PM **T4-C.5**
Using GIS Data and Tools to Assess the Vulnerability of Industrial Facilities and Natural Resources to Flooding Events
Mayo MJ, Ikeda S, Briggs NL, Petito Boyce C, Mayfield DB
Gradient

Sponsored by:
Decision Analysis and Risk Specialty Group

3:30 PM – 5:00 PM

Salon D

T4-D Symposium: DOD Efforts to Advance Risk Assessment of Nanomaterials

Chair: Jo Anne Shatkin

3:30 PM **T4-D.1**
A DOD Framework for Examining Possible Health and Environmental Impacts of Nanomaterials for Use in Weapon Systems
Rak A, Underwood PM, Shatkin JA, Ede J
Noblis and Office of the Assistant Secretary of Defense (Energy, Installations, and Environment)

3:50 PM **T4-D.2**
Quantifying Release from Nano and Advanced Material Enabled Products
*Brame JA, Alberts E, Poda AR, Kennedy AJ**
US Army Engineer Research and Development Center

4:10 PM **T4-D.3**
Important Considerations in the Risk Assessment of DOD Relevant Nanoscale Materials
Ede JD, Shatkin JA
Vireo Advisors, LLC

4:30 PM **T4-D.4**
Assessing the Global Risk of Nanotechnology-enabled Weapons Proliferation
Nichols GP
Homeland Defense and Security Information Analysis Center (HDIAC)

Sponsored by:
Emerging Nanoscale Materials Specialty Group

3:30 PM – 5:00 PM

Salon E

T4-E Government Investment & Finance Strategies for Risk Management

Chair: Saurabh Mishra

3:30 PM **T4-E.1**
Government Support of Investment Projects as an Instrument of Risk Management
Novikova TS
Novosibirsk State University, Department of Economics

3:50 PM **T4-E.2**
Selecting Investment Strategies for Disaster Risk Reduction in Developing Countries: The Case of Flood Protection in the Rio Rocha Basin
Corderi Novoa D, Hori T, Yarmin L
Inter-American Development Bank

4:10 PM **T4-E.3**
Country-based Assessment of Global Risk Profiles Using Ensemble Deep Learning
Mishra S, Ayyub B
University of Maryland College Park, International Finance Corporation

4:30 PM **T4-E.4**
The Saga Continues: Insight into the Greek Debt Crisis Through a Repeated Game
Welburn JW, Hausken KH
RAND Corporation

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Risk and Development and Economics and Benefits Analysis Specialty Groups

3:30 PM – 5:10 PM

Salon FG

T4-F Power Systems Resilience

Chair: Roshi Nateghi

3:30 PM **T4-F.1**
Forecasting Storm-Induced Power Outages and Restoration Personnel Needs
Guikema SD, Quiring S, Buckstaff K, Beck M, Nateghi R, McRoberts B, Logan T
University of Michigan

3:50 PM **T4-F.2**
Allocating Resources to Enhance Resilience, with Application to Superstorm Sandy and an Electric Utility
MacKenzie CA, Zobel CW
Iowa State University

4:10 PM **T4-F.3**
Quantifying Power System Resilience to Support Decisions in the Face of Adverse Weather Events
Staid A, Watson JP, Bynum ML, Arguello B
Sandia National Labs

4:30 PM **T4-F.4**
Electric Power System Inadequacy Risk in the Residential Sector
Nateghi R
Purdue University

4:50 PM **T4-F.5**
Assessing the Resilience Power Systems Under Renewable Sources Supply Risk
*Winckler V, Wollega E, Baroud H**
Vanderbilt University

Sponsored by:
Engineering and Infrastructure Specialty Group

3:30 PM – 5:10 PM

Salon H

T4-G Symposium: Foundational Issues in Risk Analysis II

Chair: Roger Flage

3:30 PM **T4-G.1**
A Safety Perspective on Systemic Risk
Selvik JT, Signoret JP
University of Stavanger, International Research Institute of Stavanger, France: Project leader of ISO/TR 12489

3:50 PM **T4-G.2**
Emerging Empirical Research on Risk Perception and Risk Behavior Using the New Uncertainty–based Risk Perspectives
Bjerga T, Aven T
University of Stavanger

4:10 PM **T4-G.3**
The Rise of Resilience: Inside the Strange World of Risk and Sustainability Governance
Merad MM
CNRS

4:30 PM **T4-G.4**
Antibiotic Resistance: The Need for a New Risk Assessment Framework
*Wu F, Chen C**
Michigan State University

4:50 PM **T4-G.5**
Knowledge Dimensions in the Risk Field – Ontologies and Epistemologies
Ylonen M
VTT Technical Research Centre of Finland

Sponsored by:
Foundational Issues in Risk Analysis Specialty Group

3:30 PM – 5:10 PM

Salon J

T4-H Symposium: Innovative Microbial Risk Modeling for Food Supply Chain

Co-chairs: Abani Pradhan, Yanbin Li

3:30 PM **T4-H.1**
Innovative Supply Chain and System Modeling Approaches for Pathogenic Bacteria in Leafy Greens
Pradhan AK
University of Maryland, College Park

3:50 PM **T4-H.2**
Application of Failure Mode Effects Criticality Analysis (FMECA) for Effective Implementation of Food Safety Plans
Kottapalli B
ConAgra Brands

4:10 PM **T4-H.3**
A Novel Approach for Modeling Microbial Cross-contamination Dynamics Inside Food Manufacturing Facilities
Mokhtari A, Oryang D, Chen Y, Van Doren J
FDA-CFSAN

4:30 PM **T4-H.4**
Risk-Driven Decision-Making Towards Food Protection in China: Quantitative Tools and Analysis
Rainwater CR, Pohl EP, Enayaty FE
University of Arkansas

4:50 PM **T4-H.5**
Exploring Efficient Simulation Techniques in Quantitative Microbial Risk Assessment (QMRA)
Paoli G, Hartnett E
Risk Sciences International

Sponsored by:
Microbial Risk Analysis Specialty Group

3:30 PM – 5:00 PM

Salon K

T4-I Roundtable: Synthetic Biology and Gene Drives - Science, Policy, and Risk

Chair: Diane Henshel

Gene drives may have a wide range of substantial benefits to human, ecological, and agricultural populations at local, regional, and even global scales. Potential applications include reducing or stopping the spread of vector-transported diseases and invasive species, conservation of threatened/endangered species, and many more, through modification of the prevalence of a particular genotype to express or suppress genetic traits within a population. Unknown and potentially unintended consequences of gene drive applications, including off-target and non-target effects at the individual, population, and community levels, accompany these potential benefits and require numerous research, policy, and ethical considerations. Risk analysis methods can be used to evaluate potential benefits as well as consequences and inform research and policy decisions. This roundtable session will bring together a panel of leading experts in the developing science and policy of gene drives to facilitate a comprehensive discussion addressing the many facets of this rapidly progressing field.

Panelists:
Wayne Landis, Jennifer Kuzma, Keegan Sawyer, and Ben Trump

Sponsored by:
Ecological Risk Assessment Specialty Group

3:30 PM – 5:00 PM

Salon 1

T4-J Revealing Implicit and Explicit Risk Assessment as to Financial Risk and Government Precaution

Chair: Branden Johnson

3:30 PM **T4-J.1**
Disinfecting Cost-Benefit Analysis of Hidden Value-Laden Constraints
Finkel AM
Univ. of Pennsylvania, Univ. of Michigan

3:50 PM **T4-J.3**
Local Management and Effects on Citizen Reporting Risks and Externalities of Oil and Gas Drilling
Scott RP
Colorado State University

4:10 PM **T4-J.4**
Public Cues to Relative Credibility of Disputing Scientists.
Johnson BB
Decision Research

4:30 PM **T4-J.5**
The Risk Regulation Turn in Financial Regulation
Weber RF
Georgia State University

Sponsored by:
Risk Policy and Law Specialty Group

3:30 PM – 5:00 PM

Salon 2

T4-K Exposure to Chemical Contaminats in Food and Drinking Water

Chair: Chris Greene

3:30 PM **T4-K.1**
Characterizing Co-contamination in Marine and Freshwater Fish and Shellfish using Generalized Joint Attribute Modeling
Bourne K, Curtis A, Borsuk ME, Chen CY*
Duke University

3:50 PM **T4-K.2**
Trends in Toxicity Adjusted Dietary Exposure to Organophosphorous and N-Methyl Carbamate Pesticides
Nako S, Sarkar B
U.S. Environmental Protection Agency

4:10 PM **T4-K.4**
Racial Disparities in Access to Municipal Water Supplies in the American South: Impacts on Lead Exposure and Children's Health
Stillo F, MacDonald-Gibson J
University of North Carolina at Chapel Hill

Sponsored by:
Exposure Assessment Specialty Group

5:15 PM – 6:00 PM

Salon A

T5-A Roundtable: Openness in Risk Analysis: Data, Software and Reproducibility

Chair: CN Haas

Reproducibility, open data and open software are increasingly viewed as important in the conduct of science and scientifically based risk assessments. This aligns with historical concerns about transparency in risk analysis. This roundtable will facilitate a discussion on the degree to which open data, open software and principles of reproducible analysis should be encouraged, or even required, for publication in RISK ANALYSIS.

Panelists:
LA Cox, Editor-in-Chief Risk Analysis, Area Editors

8:30 AM – 10:00 AM

Salon A

W1-A Symposium: Integrated Health Impact Assessment for Air Pollution and Global Climate Change in China

Chair: Ying Li

8:30 AM **W1-A.1**
Activity Patterns of Exposure to Indoor and Outdoor Air Pollution in Chinese Population
Duan X, Wang B, Cao S, Jiang Y, Wang L
University of Science and Technology of Beijing

8:50 AM **W1-A.2**
Evaluation of China's Mercury Emission Controls in the Coal-fired Power Industry: Projection for the Health and Welfare Effects
Zhang W, Zhen G, Chen L, Wang H, Li Y, Ye X, Tong Y, Zhu Y, Wang X
Renmin University of China

9:10 AM **W1-A.3**
Trade-induced Atmospheric Mercury Deposition over China and Implications for Demand-side Controls
Long C, Haoran Z, Wei Z, Xuejun W
East China Normal University

9:30 AM **W1-A.4**
Projecting Future Climate Change Impacts on Heat-related Mortality in Large Urban Areas in China
Li Y, Ren T, Zhang W, Chen K
East Tennessee State University

Sponsored by:
Economics and Benefits Analysis Specialty Group

8:30 AM – 10:00 AM

Salon B

W1-B Roundtable: The EU and the US Projects & Activities in the Area of Resilience Assessment: How Far are We from a Common Global Approach?

Chair: Aleksandar Jovanovic

The round table would involve 2-3 "flash presentations" (5 mins max., each) from the US (leading initiatives/institutions) and respective 2-3 presentation from the current leading projects/institutions in the EU. It will be followed by the moderated discussion around the following main issues:

a. Is a common guideline needed and possible?
b. Is a global data pool on threats and indicators a realistic and senseful goal? How to get closer to it?
c. Are the national/geographic/regional differences greater than the differences among the different infrastructures;
d. How to deal with explosion of possible scenarios in practical analysis of cascading effects.

The discussion will include some polling of opinions and establishing of the priorities for alignment, aiming at identifying the issues where the investment in alignment will yield the most benefit. In addition, the risks and drawbacks of the "hollow agreements" should be identified and the best suited practical forms of alignment actions proposed.

Panelists:
Fred Petit, ANL, USA; Duane Verner, ANL, USA; Aleksandar Jovanović, EU-VRi, Germany; Marie Valentine Florin, IRGC, Switzerland; Igor Linkov, USACE, USA; Knut Øien, EU-VRi, Germany

Sponsored by:
Engineering and Infrastructure Specialty Group

8:30 AM – 10:00 AM

Salon C

W1-C Symposium: Methods of Quantifying Risk and Burden of Foodborne Illness

Chair: Ioana Marasteanu

8:30 AM **W1-C.1**
Estimating the Risk of Foodborne Illness Attributed to Food Handling Behaviors in Retail Food Establishments and Households
Marasteanu IJ, Liggans G, Otto J, Lasher A
FDA

8:50 AM **W1-C.2**
Restriction of Recently Ill Food-preparation Employees in Retail Food Establishments: Evaluation of Risk Assessment Results on Foodborne Norovirus Transmission
Fanaselle W, Pouillot R, Liggans G, Williams L, Van Doren J
Federal Government, U.S. Food and Drug Administration

9:10 AM **W1-C.3**
Evolution of the Value of the Burden of Foodborne Illness in Regulatory Analysis
Lasher A
FDA

9:30 AM **W1-C.4**
An Exposure Weighted Measure of Foodborne Illness Risk in Regulatory Analysis
Astill GM
Economic Research Service, USDA

Sponsored by:
Decision Analysis and Risk Specialty Group

8:30 AM – 10:00 AM

Salon D

W1-D From Nanotechnology Risk Management to Innovative Governance: Developing a Reliable and Trustable Framework and Tools

Co-chairs: Khara Grieger, Piet Sellke

8:30 AM **W1-D.1**
Risk Governance in caLIBRAte: The Integration of Analysis, Perception and Participation
Sellke P, Porcari A, Borsella E, Benighaus C, Mehmood A, Kelly S, Renn O, Rodrigures I
Dialogik

8:50 AM **W1-D.2**
Development of Nano-Risk Radar for Emerging Risks Related to Nanotechnology/Nanomaterials for the EU Project caLIBRAte
Jovanovic A, Qunitero FA, Ahmad M
Steinbeis Advanced Risk Technologies GmbH

9:10 AM **W1-D.3**
Moving from Risk Assessment to Risk Governance and Decision Support for Nanomaterials: Lessons Learned from Select Case Studies
Grieger KD
RTI International

Sponsored by:
Emerging Nanoscale Materials and Decision Analysis and Risk Specialty Groups

8:30 AM – 10:00 AM

Salon E

W1-E Emerging Threats and Deterence

Chair: Steve Streetman

8:30 AM **W1-E.1**
HAZOP Based Emerging-Technology Scenario Hazard Screening
Barrett AM
ABS Consulting, GCR Institute

8:50 AM **W1-E.2**
Improving Complex Security Risk Analysis with Computational Creativity
Crowther KG
MITRE Corporation

9:10 AM **W1-E.3**
Deterrence or Deflection? Gauging Perceptions of Defensive Deterrence and Target Substitutability
Davenport C, Smith DS
University of Maryland

9:30 AM **W1-E.4**
Degree of Difficulty for Terrorist Attacks: An Approach to Improving Likelihood Assessment and Evaluation of Alternatives for Decision Making
Streetman SS
Data Architecture Solutions, Inc.

Sponsored by:
Security and Defense Specialty Group

8:30 AM – 10:00 AM

Salon FG

W1-F Roundtable: Conflict of Interest and Bias in Conducting Research and Risk Assessments: Views from Multiple Perspectives

Chair: Jacqueline Patterson

Charges or claims of conflict of interest (COI) are made with increasing frequency in the field of risk assessment. Concerns are raised regarding the potential for employment, associations, or funding sources to interfere with the ability of a scientist to objectively conduct or interpret studies, or serve on peer review or advisory panels. Panelists will reflect upon COI and potential for bias that could impact their professional work and how one might mitigate or manage biases and COI. Speakers will address questions such as: How are affiliation and funding source viewed when evaluating potential conflicts of interest and bias? How might the source of funding influence study design, reporting of data, and interpretation? How can concerns regarding COI and bias be managed for peer review and advisory panels, and journal reviewers, editors, and publishers? Are there ways to minimize bias and COI impacts? How do we deal with publication bias? It is important to recognize possible sources of COI and bias and develop ways to mitigate the potential effects. This roundtable will provide an opportunity for participants to discuss openly issues around conflicts and how COI and bias might affect scientists' work, as well as their integrity and credibility.

Panelists:
Richard Becker, American Chemistry Council; Kevin Elliott, Michigan State University; Elaine Faustman, University of Washington; Rita Schoeny, US Environmental Protection Agency (retired); Kun Don (Sue) Yi, Syngenta Crop Protection

Moderator:
Jacqueline Patterson, Risk Science Center, University of Cincinnati

Sponsored by:
Foundational Issues in Risk Analysis Specialty Group

8:30 AM – 10:00 AM

Salon H

W1-G Applied Risk Managment: Monitoring, Statistical Methods, Metrics and Communication

Chair: Willy Roed

8:30 AM **W1-G.1**
Real-Time Monitoring Tools and Risk Based Regulatory Oversight - The Internet of Things Case Study
Mangalam S, Lal Das P
PRISM Institute

8:50 AM **W1-G.2**
Development and Implementation of a Risk-Informed Monitoring Program for the Saltstone Disposal Facility
*Pinkston KE, Ridge AC**
US Nuclear Regulatory Commission

9:10 AM **W1-G.3**
Risk Evaluation in Industrial Property insurance Based on Fuzzy ANP and Fuzzy TOPSIS
Sheikh Hassani N
Akdeniz University

9:30 AM **W1-G.4**
Updating the Tool-Box for Risk Management - A Practical Case Study
Røvang LB, Gravdal T, Bersaas J
Gassco AS

Sponsored by:
Applied Risk Managment Specialty Group

8:30 AM – 10:00 AM

Salon J

W1-H Miscellaneous - Foundations

Chair: Myriam Merad

8:30 AM **W1-H.1**
Normal Chaos in Managing Risks – Dealing with Complex Processes
*Lauder M, Marynissen H, Summers T**
Antwerp Management School, University of Maryland

8:50 AM **W1-H.2**
Is Hazard Identification a Scientific Process? Recent Evaluations of Glyphosate Suggest Room for Interpretation.
De Roos AJ
Dornsife School of Public Health at Drexel University

9:10 AM **W1-H.4**
The Deepwater Horizon Disaster: Data and Causality from the Investigation Reports Revisited through Ontologies
Eude T, Gangemi A, Travadel S, Guarnieri F
MINES ParisTech, PSL - Research University France and Université Paris Nord France, ISTC-CNR Italy

9:30 AM **W1-H.5**
Differences Between Experts and Laypeople: Risk Prioritization in the Food Domain Using Deliberative and Survey Methods
Siegrist M, Hübner P, Hartmann C
ETH Zürich

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Foundational Issues in Risk Analysis Specialty Group

8:30 AM – 10:00 AM

Salon K

W1-I Exposure, Hazard and Risk Assessment: Putting Exposure Back in the Process

Co-chairs: Patricia Nance, Debra Kaden

8:30 AM **W1-I.1**
Hazard vs. Risk: Blurring of the Lines
Kaden DA
Ramboll Environ

8:50 AM **W1-I.2**
Chemical Hazard Assessment Tools for Identification of Chemicals of Concern.
Whittaker MH
ToxServices LLC

9:10 AM **W1-I.2**
Global Trends in Risk Assessment in Pesticide Regulation
Kelly ID, Ryan NM
Bayer Crop Science

9:30 AM **W1-I.4**
Risk, Hazard, Precaution, and Adaptive Policy Learning
Wiener JB
Duke University

Sponsored by:
Exposure Assessment Specialty Group

8:30 AM – 10:00 AM

Salon 1

W1-J Roundtable: Challenges in Communicating the Results of Public Health Benefit-risk Assessments

Chair: Elisabetta Lambertini

Benefit-risk assessment (BRA), or risk-benefit assessment, is an emerging tool in public health. Regulatory bodies, industry, and consumers are realizing more and more that unilateral focus on only risks or benefits associated with a certain drug, medical procedure, or food product is insufficient, and decisions need to balance adverse and beneficial health effects. However, results from BRAs can be quite complex to communicate to decision makers and the public. For instance, risk and benefit metrics vary in complexity, from incidence of illness to integrated measures such as disability adjusted life years. An intervention may reduce risk in one population but increases it in another. Uncertainty and variability in inputs and outputs are also challenging to communicate. Consumers also tend to perceive risks and benefits differently, which affects how information needs to be conveyed. Communication also plays a key role in the development of BRAs. By their multidisciplinary nature, BRAs bring together a diverse range of experts such as epidemiologists, modelers, toxicologists, microbiologists, and economists who must communicate effectively with risk-benefit managers. The goal of this round table is to bring together BRA professionals from different health disciplines to discuss challenges and strategies to improve the communication of BRA results to the public and decision makers. Panelists will provide a brief overview of their work, difficulties they face in communicating with managers and the public, and lessons learned. The discussion will be summarized in a manuscript that could potentially be submitted to Risk Analysis.

Panelists:
Richard Forshee, FDA Center for Biologics Evaluation and Research (CBER); Maarten Nauta, Food DTU (Technical University of Denmark); Igor Linkov, U.S. Army Engineer Research and Development Center; William Hallman, Rutgers University

Sponsored by:
Risk Communication Specialty Group

8:30 AM – 10:10 AM

Salon 2

W1-K Risk Communication at Home and the Workplace

Chair: Robyn Wilson

8:30 AM **W1-K.1**
Barriers to Private Well and Septic Management in Under-Served Communities: An Analysis of Homeowner Decision Making
Fizer C, MacDonald-Gibson J, Bruine de Bruin W
University of North Carolina

8:50 AM **W1-K.2**
New Mental Modeling Technology™ Adds Capability to Risk Reducing and Life Saving Risk Communication
Vink D, Wood MD
Crossroad Communications Inc.

9:10 AM **W1-K.3**
Linking Heuristic-systematic Processing to Adoption of Behavior
Yang S
University of Wisconsin-Madison

9:30 AM **W1-K.4**
Effects of Using Indoor Air Quality Sensors on Perceptions and Behaviors: Pittsburgh Empowerment Lending Library Study
Wong-Parodi G, Dias B, Taylor M
Carnegie Mellon University

9:50 AM **W1-K.5**
Exploring Concepts of Risk and Safety in a University Setting Through PhotoVoice
Jardine CG, Cooper A
University of the Fraser Valley, University of Alberta

Sponsored by:
Risk Communication Specialty Group

10:30 AM – 12:00 PM

Salon A

W2-A Symposium: Burden of Disease from Environmental Hazards in the Home and Community: Why? How? What? So What?

Chair: Kevin Brand

10:30 AM **W2-A.1**
An Overview of Estimating the Environmental Burden of Disease in Ontario, Canada
Greco SL, Kim JH, MacIntyre E, Copes R
Public Health Ontario

10:50 AM **W2-A.2**
Estimating the Burden of Foodborne and Waterborne Illness in Ontario
Kim JH, Greco SL, Copes R
Public Health Ontario

11:10 AM **W2-A.3**
Population Health Impact Estimates: Unplugged
Brand KP, Lin Z
University of Ottawa

11:30 AM **W2-A.4**
Communicating the Results of an Environmental Health Burden to Decision-makers, the Public, and the Media
Copes R
Public Health Ontario

Sponsored by:
Economics and Benefits Analysis Specialty Group

10:30 AM – 12:00 PM

Salon B

W2-B Roundtable: Decentralization: What Might It Mean for Risk Governance?

Chair: Sandra Hoffmann

The U.S., the E.U., and the U.K., among others, are all seeing demand for greater decentralization of governance. What might this mean for risk governance in particular? There is a suite of issues that arise in considering the most effective location of governance, e.g., uniformity vs. variation, legal authority to act, administrative competence at each level, race to the bottom, cross-jurisdiction "leakage," inter-jurisdictional externalities (national or global public goods). This Roundtable is a discussion aimed at identifying issues that risk analysts need to think about with increased interest in decentralized governance.

Moderator:
Sandra Hoffmann (USDA Economic Research Service)

Panelists:
Jonathan Wiener, Duke University, School of Law; Alison Cullen, University of Washington, Evans School of Public Policy; John Graham, Indiana University School of Environmental and Public Affairs; Regine Paul, Bielefeld University, Sociology, Law and Society Unit; Ragnar Löfstedt, King's College London, Centre for Risk Management

Sponsored by:
Economics and Benefits Analysis Specialty Group

10:30 AM – 12:10 PM

Salon C

W2-C Risk Analysis for System Risk Analysis

Chair: Quahyan Zhu

10:30 AM **W2-C.1**
How Resilience Analytics Addresses Several Participants Disrupting Priorities for Infrastructure Systems
Almutairi A, Andrews D, Lambert JH*
University of Virginia

10:50 AM **W2-C.2**
Development of an Indicator Set for Resilience Quantification of Electricity supply
Gasser P, Suter J, Cinelli M, Lustenberger P, Wansub K, Spada M, Burgherr P, Hirschberg S, Stojadinovic B
Singapore-ETH Centre

11:10 AM **W2-C.3**
Optimal Checkpointing of Fault Tolerant Systems Subject to Correlated Failure
Bentolhoda Jafary BJ, Lance Fiondella LF
University of Massachusetts Dartmouth

11:30 AM **W2-C.4**
Factored Markov Game Theory for Secure and Resilient Infrastructure Networks
*Huang L, Chen J, Zhu Q**
New York University

11:50 AM **W2-C.5**
Resilience of Food, Energy, and Water Infrastructure for Coastal Cities and Displaced Populations
Hassler ML, Collier ZA, Bier V, Lambert JH
University of Virginia

Sponsored by:
Decision Analysis and Risk Specialty Group

10:30 AM – 12:00 PM

Salon D

W2-D Roundtable: SRA Policy Forum and SRA Nano Safety Cluster Efforts

Chair: Igor Linkov

On March 2017, the Society for Risk Analysis hosted a Policy Forum entitled "Risk Governance for Key Enabling Technologies." The Policy Forum sought to foster discussion of current initiatives that are centered on refining the risk governance of emerging technologies through the integration of traditional risk analytic tools alongside considerations of social and economic concerns. Further, the Forum drove discussion on various emerging technology options and process, including nanotechnology, industrial and medical biotechnology, synthetic biology, advanced materials, and advanced manufacturing technologies. This roundtable will reflect discussion raised from the Policy Forum related to emerging technologies, and will also include insight from recent efforts from the Society for Risk Analysis' Nano Safety Cluster on the subject of decision tools to inform nanomaterial governance.

Panelists:
Igor Linkov (US Army Corps of Engineers), Jennifer Kuzma (North Carolina State University), Treye Thomas (Consumer Product Safety Commission, USA), Marie-Valentine Florin (International Risk Governance Council, Switzerland), Benjamin Trump (US Army Corps of Engineers)

Sponsored by:
Emerging Nanoscale Materials Specialty Group

10:30 AM – 12:00 PM

Salon E

W2-E Cyber and Game Theory

Chair: Diane Henshel

10:30 AM **W2-E.1**
Expert Elicitation of Cyber Security Experts: What is Cyber Security Risk?
Henshel DS, Cains MG, Taber DL, King ZM
Indiana University, Bloomington

10:50 AM **W2-E.2**
Cyber Risk Analysis for a Smart Grid: How Smart is Smart Enough? A Multi-Armed Bandit Approach to Cyber Security Investment
*Smith MD, Pate-Cornell ME**
Stanford University

11:10 AM **W2-E.3**
Cyber Attack Risk Evaluation using a Stochastic Epidemiological Framework
Alexeev A, Henshel DS, Agarwal V, Cains MG
Indiana University

11:30 AM **W2-E.4**
Integrating Defenders and Attackers into Cyber Security Risk Models
*Agarwal V, Henshel DS, Alexeev A, Cains MG**
Indiana University

Sponsored by:
Security and Defense Specialty Group

10:30 AM – 12:00 PM

Salon FG

W2-F Interdependent Infrastructure Systems

Co-chairs: Allison Reilly, Hiba Baroud

10:30 AM **W2-F.1**
Disruptions of Emergent and Future Conditions in Advanced Logistics Systems
Thorisson H, Lambert JH
University of Virginia

10:50 AM **W2-F.2**
Transportation Network Vulnerability Assessment Using Dynamic Traffic Simulation
Shekar V, Fiondella L, Halappanavar M, Chatterjee S
University of Massachusetts Dartmouth, Pacific Northwest National Laboratory

11:10 AM **W2-F.3**
Ontology-based Approach to Modeling Interdependency of Critical Infrastructure
Yan JY
ETH Zürich

11:30 AM **W2-F.4**
Risk Reduction Assessment of Innovative Solutions to Interdependent Cascading Infrastructure Failures
Zimmerman R
New York University

Sponsored by:
Engineering & Infrastructure Specialty Group

10:30 AM – 12:00 PM

Salon H

W2-G Applied Risk Management: Three Completely Different Ways to Manage Natural Hazard Risks

Chair: Cameron MacKenzie

10:30 AM **W2-G.2**
Storm Surge-based Flood Risk in Coastal Louisiana: Impacts of Louisiana's 2017 Coastal Master Plan and Methods for Uncertainty Propagation
Johnson DR, Fischbach JR, Kuhn K
Purdue University, RAND Corporation

10:50 AM **W2-G.3**
Quantitative Risk Analysis in a Multirisk Scenario of Natural Hazards
Bronfman NC, Cisternas PC, Gonzalez D*
Universidad Andres Bello, National Research Center for Integrated Natural Disaster Management

11:10 AM **W2-G.4**
Learning from Imbalanced Data Sets for Estimating Power Outages
Kabir E, Guikema S
University of Michigan

Sponsored by:
Applied Risk Managment Specialty Group

10:30 AM – 12:00 PM

Salon J

W2-H Foundational Issues in Risk Analysis III

Chair: Seth Guikema

10:30 AM **W2-H.1**
Core Subjects and Principles of Risk Analysis
Aven T
University of Stavanger, Norway

10:50 AM **W2-H.2**
Quantitative Risk Modeling and Management of Interdependent Complex Systems of Systems
Haimes YY
University of Virginia

11:10 AM **W2-H.3**
What is an Effect?
Cox LA
Cox Associates, University of Colorado

11:30 AM **W2-H.4**
Concepts and Connections, Choices and Conundrums: The Boundary Between What is Inside and What is Outside a Risk Assessment
Goble R
Clark University

Sponsored by:
Foundational Issues in Risk Analysis Specialty Group

10:30 AM – 12:00 PM

Salon K

W2-I Roundtable: Embracing Chemical Exposure Science for Effective Public Health Protection

Moderators: Carrie Fleming, Annette Guiseppi-Elie

The human health risk assessment paradigm is changing and one important aspect of this is the focus upon the exposure element of risk assessments. To date, the greater weight has generally been on hazard in the risk assessment process, with exposure being considered retrospectively. The result is the expenditure of considerable time, effort and resource on acquiring hazard information that ultimately is not always required to reach conclusions on the safety of a chemical. Scientists have been working to develop exposure and risk assessment methods and tools to change this paradigm, however a limiting factor is that exposure assessments are specific to the chemical use pattern/scenario and this can lead to 'silos' of approaches and knowledge in different sectors. This Roundtable aims to bring together different sectors (agrochemicals, consumer products, industrial chemicals) and Regulators who need exposure data, and leverage approaches across these sectors.

Thought-starters (5 mins each) will be presented and charge questions will be considered by the Panel and the audience, aiming to identify key areas/topics/gaps that should be considered further:

1. Advancing Exposure's Profile in Providing the Context For Toxicity Testing and Risk Assessment – Annette Guiseppi-Elie, US EPA National Exposure Research Laboratory, ORD
2. Meeting FDA needs for data on dietary exposures to food contaminants – Judith Spungen, Food and Drug Administration
3. What needs to change in the agrochemical industry? – Carrie Fleming, Dow AgroSciences
4. Globalizing Chemical Exposure Models – Rosemary Zaleski, ExxonMobil
5. Emerging Opportunities and Challenges for Human Exposure Assessment – Mike Dellarco, NIH

This Roundtable aims to provide a forum for scientists to discuss recent advances in the area of exposure assessment for chemicals. .

Sponsored by:
Exposure Assessment Specialty Group

10:30 AM – 12:00 PM

Salon 1

W2-J Symposium: The Risk of Citizen Opposition: Tools to Foster Public Participation with and Acceptance of Energy Policy Issues

Chair: Marilou Jobin

10:30 AM **W2-J.1**
Are Decision Support Systems Practical Tools for Public Participation? Insights from Tracing Laypeople's Decision Processes Regarding the Future Energy Portfolio
Jobin M, Visschers VHM, van Vliet OPR, Siegrist M
ETH Zürich

10:50 AM **W2-J.2**
Thinking Critically About Public Participation in Renewable Energy Decisions: Insights from the First U.S. Offshore Wind Development
Bidwell D, Dwyer J
University of Rhode Island

11:10 AM **W2-J.3**
Public Participation in Energy Transitions: What We Can Learn About Public Attitudes from Diverse Engagement Methods
Demski C, Spence A, Pidgeon N
Cardiff University, University of Nottingham

11:30 AM **W2-J.4**
Governance of Renewable Energy Infrastructure Planning. Potentials for Public Participation
Schweizer PJ
Institute for Advanced Sustainability Studies Potsdam

Sponsored by:
Risk Policy and Law Specialty Group

10:30 AM – 12:10 PM

Salon 2

W2-K Risk Communication and Severe/Extreme Weather

Chair: Gina Eosco

10:30 AM **W2-K.1**
Perceptions of Risk and Vulnerability Following Exposure to a Major Natural Disaster: The 2013 Calgary Flood
Tanner A, Arvai J
University of British Columbia, University of Michigan

10:50 AM **W2-K.2**
Effect of Risk and Protective Decision Aids on Flood Preparation in Vulnerable Communities
Wong-Parodi G, Fischhoff B, Strauss B
Carnegie Mellon University, Climate Central

11:10 AM **W2-K.3**
Weather Forecasters' Use of Ensemble-based Uncertainty Information for Communicating Risks of Extreme weather
Demuth JL, Morss RE, Jankov I, Alexander C, Alcott T, Nietfeld D, Jenson T
National Center for Atmospheric Research

11:30 AM **W2-K.4**
Differing Perceptions of Hurricanes and Nor'easters
Cuite CL, Hallman WK, Shwom RL, Demuth J, Morss R
Rutgers University

11:50 AM **W2-K.5**
Communicating Earthquake Hazard
Marti M, Stauffacher M
ETH Zürich

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RIsk Communication Specialty Group

1:30 PM – 3:00 PM

Salon A

W3-A Symposium: From Regulating to Communicating Food Safety Risks, Costs, and Benefits: Practitioners™ Challenges and Solutions

Chair: Aliya Sassi

1:30 PM **W3-A.1**
Sanitary Transportation of Food: Examining Industry Practices and the Costs and Benefits of the FSMA Regulatory Requirements
Lange R, Sassi A
U.S. Food and Drug Administration

1:50 PM **W3-A.2**
Delivery of Safe Food to Rural and Frontier Areas: Examination of Gaps and Constraints
Sertkaya A, Ackerley N, Ertis D, Grayson P, Vardon P, Sassi A*
Eastern Research Group, Inc., U.S. Food and Drug Administration

2:10 PM **W3-A.3**
The Economic Impact of the United States Department of Agriculture's Environmental Testing Requirements to Reduce the Incidence of Listeria Monocytogenes in Ready-to-Eat Meat and Poultry Products
*Minor T, Parrett M**
U.S. Department of Agriculture, U.S. Food and Drug Administration

2:30 PM **W3-A.4**
FDA's Internal Message Testing Network: An Innovative Approach to Risk Communication
Weinberg J, Lappin B
U.S. Food and Drug Administration

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Economics and Benefits Analysis Specialty Group and Society for Benefit-Cost Analysis

1:30 PM – 3:00 PM

Salon B

W3-B Roundtable: Science and Policy at the 2019 Fifth World Congress on Risk

Chair: James H. Lambert

The Society for Risk Analysis (SRA) Fifth World Congress on Risk will be in Cape Town, South Africa, on May 6-8, 2019. The SRA World Congresses have convened in Singapore (2015), Sydney (2012), Guadalajara (2008), and Brussels (2003). With an overall theme Development and Resilience, the Fifth World Congress will feature topics within and across all SRA specialty groups as well as latest interests for the Africa region and worldwide. Participants will come from universities, consulting, industry, government, and military. Half-day and full-day continuing education workshops will complement the technical program (plenaries, roundtables, symposia, individual abstracts). Discussion and audience participation in this Roundtable will identify and lead discussion of key concepts that will distinguish the 2019 event, including a characterization of abstracts that were submitted in the early window closing December 1, 2017.

Panelists:
Bilal Ayyub, Robin Cantor, Alison Cullen, Mary Gulumian, Sasa Jovanovic, Charlie Menzie, Myriam Merad, Patricia Nance, Ortwin Renn, Jo Anne Shatkin

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Risk and Development Specialty Group

1:30 PM – 3:00 PM

Salon C

W3-C Atlas Shrugged: Geospatial Decision Analysis

Chair: Michelle Hamilton

1:30 PM **W3-C.2**
Integrating Geospatial Information in Network Modeling for Prepositioning Supplies Under Extreme-event Conditions
Resurreccion JZ, Blanco AB, Santos JR, Bangate JM
University of the Philippines-Diliman, The George Washington University

1:50 PM **W3-C.3**
Geospatial Decision Analysis for Military Base Camp Siting
Cegan JC
US Army Corps of Engineers

2:10 PM **W3-C.4**
A Regional Risk and Vulnerability Assessment with Multiple Criteria Decision Analysis to Support Evidence-Based Investment
Hamilton M, Morath D, Curran R, Hughey E, Green J, Batzel J
CCRi

Sponsored by:
Decision Analysis and Risk Specialty Group

1:30 PM – 3:00 PM

Salon D

W3-D Hazard-Specific Risk Assessment

Chair: Charles Redinger

1:30 PM **W3-D.1**
Cancer Risk Associated with Exposure to Bitumen and Bitumen Fumes: An Updated Systematic Review and Meta-Analysis
Mundt KA, Dell L, Crawford L, Sax S, Boffetta P*
Ramboll Environ

1:50 PM **W3-D.2**
Management of Pesticides and Their Containers in a Irrigation District in Yucatan, Mexico: Risk Factors for Human Health
Flores-Serrano RM, Pérez-Casimiro G, Álvarez-Florentino E, Ramírez-González A, Ruiz-Piña HA, Rendón-Von Osten J, Aké-López R, Flores-Guido JS
Universidad Nacional Autónoma de México, Universidad Autónoma de Yucatán, Universidad Autónoma de Campeche

2:10 PM **W3-D.3**
Evaluation of Risk of Occupational Injuries and Hearing Loss Among Informal Electronic Waste Recyclers
Langeland AL, Neitzel RL, Nambunmee K, Sayler SK
University of Michigan, Mae Fah Luang University

2:30 PM **W3-D.4**
Risk Assessment of Combined Exposure to Multiple Organophosphorus Pesticides
*Chang BS, Chen YJ, Chuang YC, Lin JW, Wu KY, Ho WC, Chiang SY**
China Medical University

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Occupational Health and Safety Specialty Group

1:30 PM – 3:00 PM

Salon E

W3-E Symposium: Emerging Issues in Global Catastrophic Risks and Development

Chair: Dori Stiefel

1:30 PM **W3-E.1**
Anticipating the Unintended Consequences of Science and Technology
*Tonn BE, Stiefel D**
University of Tennessee

1:50 PM **W3-E.2**
Quantifying Long-Term Severity
Baum SD
Global Catastrophic Risk Institute

2:10 PM **W3-E.3**
Recent Advances in Feeding the Earth in Global Catastrophes
Denkenberger DC, Taylor AR, Black R, Pearce JM
Tennessee State University

Sponsored by:
Risk and Development and Security and Defense Specialty Groups

1:30 PM – 3:00 PM

Salon FG

W3-F Symposium: Integrated Research for Disaster Risk Reduction

Chair: Ann Bostrom

1:30 PM **W3-F.1**
Enabling integrated Disaster Risk Research with the RAPID facility
Wartman JB, Berman J, Olsen M, Miles S, Irish J, Gurley K, Bostrom A, Lowes L*
University of Washington

1:50 PM **W3-F.2**
Urban Ecological Risk Assessment Based on Green Infrastructure Theory
Zheng H, Xu L
Beijing Normal University

2:10 PM **W3-F.3**
Engaging Communities in Tsunami Risk Planning with Probabilistic Hazard Information
Grant A, Abramson D, Bostrom A, Gonzales F, Leveque R, Greenfield M
University of Washington

2:30 PM **W3-F.4**
Earthquake Risk Experiences, Expectations, Early Warnings, Planning, and Preparedness in Washington State
Bostrom A, Ahn A, Vidale J, Abramson D
University of Washington

Sponsored by:
Engineering and Infrastructure Specialty Group

1:30 PM – 3:00 PM

Salon H

W3-G Roundtable: Does EPAs Risk Practices Follow its Amended TSCA Pledges?

Chair: Steve Gibb

Under the June 2016 amendments to the Toxic Substances Control Act, EPA has pledged to use broadly accepted agency risk assessment guidance and methods when evaluating new and existing chemicals. It has sought public comment on key science terms such as weight of evidence and best available science. However, pledges and the actions that follow are not always consistent. This session will tap the expertise of consultants, academics, editors and others in discussing how EPA's risk choices seem to be in-, or out-of-line with past agency practices. In particular, the session will address susceptible subpopulations such as children and workers and how they are accounted for.

Panelists:
Steve Gibb, Bloomberg BNA; Tracey Woodruff, UCSF; Jack Fowle, Science to Inform; Tom Burke, Johns Hopkins (invited).

Sponsored by:
Applied Risk Management Specialty Group

1:30 PM – 3:00 PM

Salon J

W3-H Understanding Antimicrobial Resistance as a Global Concern

Co-chairs: Abani Pradhan, Jade Mitchell

1:30 PM **W3-H.1**
A Theoretical Approach to Network Modeling of Antibiotic Resistance
Keisler M, Foran C, Keisler J, Linkov I*
University of Massachusetts Amherst

1:50 PM **W3-H.2**
Antibiotic-Resistant Staphylococcus Aureus Transmission from Hog Farms to Humans: Bayesian Network Risk Assessment Models
MacDonald-Gibson J, George A
University of North Carolina at Chapel Hill

2:10 PM **W3-H.3**
Comparative Exposure Assessment of ESBL-producing Escherichia coli through Meat Consumption
Evers EG, Pielaat A, Smid JH, van Duijkeren E, Vennemann FBC, Wijnands LM, Chardon JE
RIVM The Netherlands

2:30 PM **W3-H.4**
Toward Preventing a Doomsday Pandemic
Macal CM, MacDonell MM, Mishra SK, Trail JB, Chang YS, Cooke RM
Argonne National Laboratory, Resources for the Future

Sponsored by:
Microbial Risk Analysis Specialty Group

1:30 PM – 3:00 PM

Salon K

W3-I PAHs & Related Compounds: Exposure and Dose-Response

Chair: Margaret Pratt

1:30 PM **W3-I.1**
Comparative Dietary Exposure Assessment of Selected Heterocyclic Amines and Polycyclic Aromatic Hydrocarbons through Meat and Bread Consumption in the United States
Pouzou JG, Costard S, Zagmutt FJ
EpiX Analytics

1:50 PM **W3-I.2**
The Influence of Polycyclic Aromatic Hydrocarbons on Lung Function in a Representative Sample of the Canadian Population
Cakmak S, Hebbern C, Cakmak JD, Dales ED
Government of Canada

2:10 PM **W3-I.3**
Benzo(a)pyrene Toxicity Value Updates: Implications for Human Health Risk Assessment
Chien J, Lemay JC
Gradient

2:30 PM **W3-I.4**
Alternative Methods for Assessing Human Health Risks from Exposure to Polycyclic Aromatic Compounds
Chrostowski PC
CPF Associates, Inc.

Sponsored by:
Dose Response and Exposure Assessment Specialty Groups

1:30 PM – 3:00 PM

Salon 1

W3-J Symposium: To Vape or Not To Vape: Risks of E-cigarette Use

Chair: Sara Henry

1:30 PM **W3-J.1**
Health Effects Associated with E-cigarettes in Vulnerable Populations
Zelikoff JT, Lauterstein D, Gordon T
New York University School of Medicine

1:50 PM **W3-J.2**
Getting a "Flavor" for Cardiovascular Effects of New and Emerging Tobacco Products
Conklin DJ
University of Louisville

2:10 PM **W3-J.3**
Human Studies to Determine the Effects of Flavored E-cigarettes on Respiratory Immune Responses
Jaspers I
University of North Carolina at Chapel Hill

2:30 PM **W3-J.4**
Quantitative Risk Assessment of Tobacco Related Toxicants: Comparisons between Combusted and Heated Tobacco Products.
Meredith C, Fiebelkorn SA
British American Tobacco

Sponsored by:
Dose Response and Risk, Policy & Law Specialty Groups

1:30 PM – 3:00 PM

Salon 2

W3-K Symposium: Reshaping Risk Assessment - New Governance Tools for Emerging Technologies

Co-chairs: Gary Marchant, Jonathan Wiener

1:30 PM **W3-K.1**
Instrument Choice for Adaptive Regulation of Emerging Technologies
Wiener JB, Bennear LS
Duke University

1:50 PM **W3-K.2**
Codes of Conduct and Private Standards for Governing Autonomous Systems
Marchant GE
Arizona State University

2:10 PM **W3-K.4**
Towards Best Practices Governing Use of "Genomics" in Civil Litigation
Marchant GE, Hartley KT, Stevens YA*
LSP Group LLC

Sponsored by:
Risk Policy and Law Specialty Group

3:30 PM – 5:00 PM

Salon A

W4-A Frontiers in Benefit-Cost and Risk Analysis

Chair: Sandra Hoffmann

3:30 PM **W4-A.1**
Individual and Social Discount Rates in Policy Analysis
Broughel J
Mercatus Center at George Mason University, Antonin Scalia Law School

3:50 PM **W4-A.3**
A New Method of Modeling and Simulating Hurricane Losses
Xian SY, Lin N, Chavas D, Oppenheimer M
Princeton University, Purdue University

4:10 PM **W4-A.4**
Produce Irrigated with Various Types of Nontraditional Water: Detecting Consumer Preferences through Cross-Regional Field Experiments
Ellis SF, Kecinski M, Messer KD
University of Delaware

Sponsored by:
Economics and Benefits Analysis Specialty Group and Society for Benefit-Cost Analysis

3:30 PM – 5:10 PM

Salon B

W4-B Climate Change Communication II

Chair: Christopher Clarke

3:30 PM **W4-B.1**
Public Support for the Climate Change Policies, from Party Support Point of View
Aoyagi M
National Institute for Environmental Studies

3:50 PM **W4-B.2**
Does Learning about Carbon Dioxide Removal (CDR) Strategies Alter Support for Climate Mitigation? The Role of Tradeoffs, Trust in Technology, and Beliefs about Tampering with Nature
Campbell-Arvai VEA, Hart PS, Raimi KT, Wolsje KS
University of Michigan

4:10 PM **W4-B.3**
Challenges in Communicating the Slow Onset Crisis of Climate Change
Hathaway JH
George Mason University

4:30 PM **W4-B.4**
The Unquestioned Assumption of Equivalence in Farmer Perceptions of Weather and Climate Change Risks
Findlater KM, Kandlikar K, Satterfield T, Donner SD
University of British Columbia

4:50 PM **W4-B.5**
Effectiveness of a Serious Game to Encourage Adequate Protective Behaviour in Case of a Freight Train Accident Involving Hazardous chemicals
Kuttschreuter M, Jong-Kamphuis N
University of Twente

Sponsored by:
Risk Communications Specialty Group

3:30 PM – 5:00 PM

Salon C

W4-C Human Factors in Decision Making

Chair: Sara Goto

3:30 PM **W4-C.1**
Examining the Effects of Objective Risks and Community Resilience on Risk Perceptions at the County Level in the U.S. Gulf Coast: An Innovative Approach
Shao W, Gardezi M, Xian S
Auburn University at Montgomery

3:50 PM **W4-C.2**
The Influence of Generational Differences on Loss Aversion and Risk Taking
Goto SK, Arvai JL
University of Michigan

4:30 PM **W4-C.4**
Using Role-play to Explore Energy Perceptions in the US and UK
Thomas M, Pidgeon N, Partridge T, Harthorn BH*
Cardiff University, University of California Santa Barbara

4:50 PM **W4-C.5**
Understanding Attitudes Towards Flood Risk with Prospect Theory
Royal A
Resources for the Future

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3:30 PM – 5:00 PM

Salon D

W4-D Looking Across Borders at Risk Assessment Policies

Chair: TBD

3:30 PM **W4-D.1**
Comparing Environmental Risk Regulations in China and the United States
Li H, Xu J
College of Environmental Sciences and Engineering, Peking University

3:50 PM **W4-D.2**
How Command-and-control System Works in China's Environmental Protection: An Empirical Study of Two Control Zones Policy of China
Fan SW
Central University of Finance and Economics

4:10 PM **W4-D.3**
Radiation Risk in Evacuation and Reoccupation Decision Making
Braley GS
Colorado State University

4:30 PM **W4-D.4**
Lead Cleanups at Superfund Sites
Julias C
CDM Smith

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3:30 PM – 5:00 PM

Salon E

W4-E Complex Models to Solve Complex Problems

Chair: Amanda Bailey

3:30 PM **W4-E.1**
Evaluation of Risk Models for the Holistic Integration of Social Science Metrics into Watershed-Scale Risk Assessment
Cains MG, Henshel DS, Landis WG
Indiana University

3:50 PM **W4-E.2**
Quantitative Tools for Linking Adverse Outcome Pathways with Process Models: Bayesian Relative Risk Networks
Von Stackelberg KE, Chu V, Mitchell C, Wallis L, Stark J, Landis W
Harvard Center for Health and the Global Environment

4:10 PM **W4-E.3**
Urban Agglomeration Nitrogen Ecological Risk Assessment Based on Risk Information Model in Pearl River Delta
Dong Y, Xu L
Beijing Normal University

4:30 PM **W4-E.4**
Mental Models of Climate Change and Food Security in Northwest Ghana
Wood AL
North Carolina State University

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Ecological Risk Assessment Specialty Group

3:30 PM – 5:10 PM

Salon FG

W4-F Infrastructure: Climate Changes and Extreme Events

Chair: Benjamin Rachunok

3:30 PM **W4-F.1**
Hurricane Power Outage Prediction with Feature Selection Approaches
Shashaani S, Guikema SD
Umiversity of Michigan

3:50 PM **W4-F.2**
Characterising and Predicting the Robustness of Coupled Power-law Networks
Johnson CA, Flage R, Guikema SD
University of Stavanger, University of Michigan

4:10 PM **W4-F.3**
Building Resilience into the Water Treatment Process Under a Changing Climate
Camp JS, Hoover PA
Vanderbilt University

4:30 PM **W4-F.4**
Risk Analysis Methods in Resilience Modeling: An Overview of Homeland Security Applications
Baroud H
Vanderbilt University

4:50 PM **W4-F.5**
Homogeneous-Use Infrastructure Modeling
Rachunok BA, Nateghi R
Purdue University

Sponsored by:
Engineering and Infrastructure Specialty Group

3:30 PM – 5:10 PM

Salon H

W4-G Symposium: Interdisciplinary Perspectives on Systemic Risks

Chair: Pia-Johanna Schweizer

3:30 PM **W4-G.1**
Governance of Systemic Risks: Challenges and Potential Solutions
Schweizer PJ
Institute for Advanced Sustainability Studies Potsdam

3:50 PM **W4-G.2**
Risk and Resilience in Complex Systems: Review of Concepts and Assessment Methods
Linkov I, Madchese D, Fox-Lent C, Trump B
US Army Engineer Research and Development Center

4:10 PM **W4-G.3**
Re-ordering Risk and Uncertainty: Implications for Cosmopolitan Risk Governance
Klinke A
University of Newfoundland

4:30 PM **W4-G.4**
Risk Governance and the Crisis of Expertise
Wong CML
University of Luxembourg

4:50 PM **W4-G.5**
Dealing with Complexity and Connectivity: The Challenge of Systemix Risks
Renn OR, Jaeger C, Lucas K
Institute for Advanced Sustainability Studies (IASS)

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Foundational Issues in Risk Analysis Specialty Group

3:30 PM – 5:00 PM

Salon J

W4-H Symposium: Incorporating System Resilience Concept in Environmental Risk Analysis

Chair: Zach Collier

3:30 PM **W4-H.1**
Facilitating Disaster Risk Reduction Through Community-based resilience Building
Huang T
National Cheng Kung University

3:50 PM **W4-H.2**
Spatial-temporal-frequency Manifold Analysis of Multipollutant Emission Variation and Sampling
Tai-Yi L, Ming-Che H, Hwa-Lung Y*
National Taiwan University

4:10 PM **W4-H.3**
Resilience, Population, and Economy: Findings from a Simulation of Reconstruction from 2011 Great East Japan Earthquake
Maeda Y
Shizuoka University

4:30 PM **W4-H.4**
Challenges and Uncertainties of Environmental Risk Assessment with Respect to Emission Estimation
*Lee CH, Yu HL**
National Taiwan University

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Foundational Issues in Risk Analysis Specialty Group

3:30 PM – 5:00 PM

Salon K

W4-I Ambient and Occupational Airborne Hazards

Chair: Katherine Walker

3:30 PM **W4-I.1**
Case Study in Data Access and Reanalysis: Diesel Engine Exhaust and Lung Cancer Mortality in the Diesel Exhaust in Miners Study (DEMS) Cohort Using Alternative Exposure Estimates and Radon Adjustment
McClellan RO, Chang ET, Lau EC, Van Landingham C, Crump KS, Moolgavkar SH
Toxicology and Human Health Risk Analysis

3:50 PM **W4-I.2**
What Does the Current Unit Risk Estimate used for Diesel Particulate Matter Cancer Risk Calculations Indicate for Worker and Environmental Health?
Pagone F, Persky J
RHP Risk Management Inc.

4:10 PM **W4-I.3**
Commuter Exposure to Air Pollutants During Transportation in Hong Kong
Lau AKH, Che WW, Li ZY, Frey HC
The Hong Kong University of Science and Technology, North Carolina State University

4:30 PM **W4-I.4**
Approaches to Estimating the Burden of Outdoor Air Pollution in Ontario
Greco SL, Kim JH, Copes R
Public Health Ontario

Sponsored by:
Dose Response, Exposure Assessment, Occupational Health & Safety, Economics & Benefits Analysis Specialty Groups

3:30 PM – 5:00 PM

Salon 1

W4-J Symposium: Risk Assessment in Tobacco Product Regulatory Decision Making

Co-chairs: Kristin Marano, P. Robinan Gentry

3:30 PM **W4-J.1**
The State of the Science of QRA in Support of Different Tobacco Product Submission Types
Gentry PR
Ramboll Environ

3:50 PM **W4-J.2**
Characterization of Inhalation Exposure to Cigarette Smoke
Liu C, Marano K
RAI Services Company

4:10 PM **W4-J.3**
Chemical Mixture Human Health Risk Assessment Methods Applicable to the Evaluation of Complex Mixtures of Tobacco Smoke
Teuschler LK
LK Teuschler & Associates

4:30 PM **W4-J.4**
Regulatory Perspective on the Assessment of Tobacco Product Risk
Yeager RP
US FDA

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Risk Policy and Law Specialty Group

3:30 PM – 5:10 PM

Salon 2

W4-K Symposium: Risk Meets Communication: A Fork in the Road or a Road Less Travelled?

Chair: Cami Ryan

3:30 PM **W4-K.1**
The Complexity of Risk: Implications for Communication
Slovic P
University of Oregon

3:50 PM **W4-K.2**
Monsanto's Evolving Communication Strategy in the Age of Mass Information
Ryan C
Monsanto Company

4:10 PM **W4-K.3**
Communicating Real Risk in a Complex World
Holsapple M
Michigan State University, CRIS Bits

4:30 PM **W4-K.4**
The Language of Law: When Risk is Tried in the Court of Public Perception
Schachtman N
Schachtman Law

4:50 PM **W4-K.5**
Understanding the Role of Trust in Risk Perception
Zaruk D
Odisee University College

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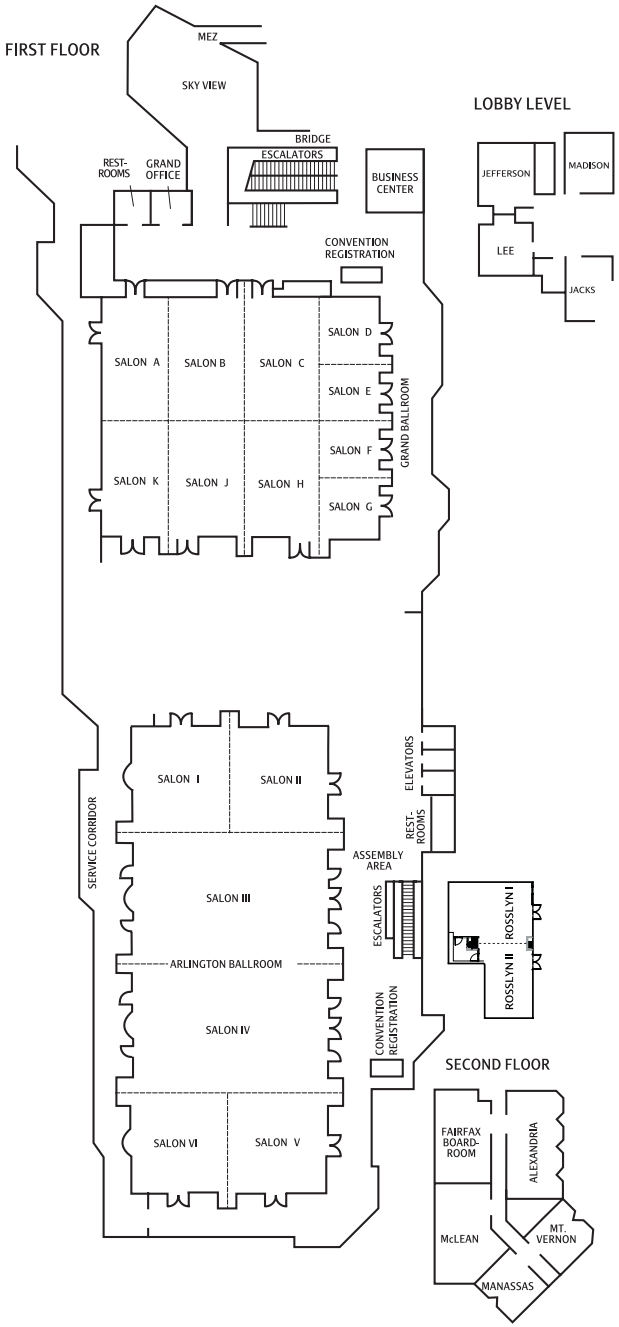
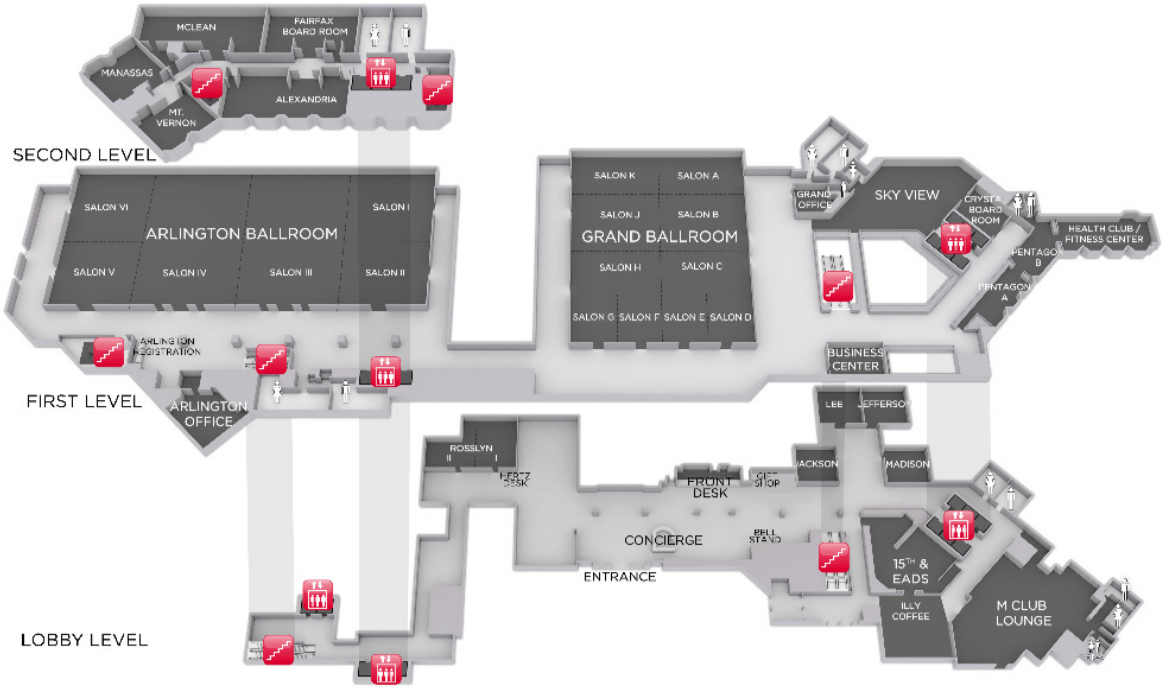
Crystal Gateway Marriott – Floorplans





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- Agriculture, food and water supply
- Human health and safety
- Law, policy and governance
- Business processes and standards
- Population and workforce behaviors
- Disaster preparedness and resilience
- Energy, transportation, logistics
- Poverty in rural and urban areas
- Infrastructure systems
- Economics, finance and fraud-related issues in enterprise and government
- Ethnic and socio-economic risks

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Please contact the organisers at:
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The objectives of the Fifth World Congress on Risk are to:

- Stimulate dialogue and learning on risk issues of worldwide interest
- Share insights to analytic methods, decision processes and policy making
- Disseminate advances in risk assessment, management, and communication
- Connect organisations and individuals
- Facilitate educational opportunities and transfer science-informed practices to user communities

The broad interdisciplinary programme features symposia, instructional courses, oral and poster presentations, informal discussion and exchange with international experts, and training workshops.

Participation of researchers and practitioners based in developing countries is essential. Applications for support of participant travel and related expenses are invited. The initial Call for Abstracts was released in July 2017 with a due date of December 1, 2017 (www.sra.org). Session organisers are asked to include presenters or discussants from developing countries.

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