

# Programme of the RISK-KAN Workshop on *Understanding and Modeling Complex Risks in Coupled Human-Environment Systems*

<b>February 8 – Systemic Risk</b>	
10:15 – 10:30	Introduction ( <i>Alessio Ciullo</i> )
10:30 – 10:55	<p><b><i>Opening talk by Christian Franzke</i></b> (Chair: <i>Jana Sillmann</i>)</p> <p><u><i>Perspectives on tipping points in integrated models of the natural and human Earth system</i></u></p>
10:55 – 12:15	<p><b><i>Systems approaches</i></b> (Chair: <i>Jana Sillmann</i>)</p> <p><b>11:00</b> <u>Operationalizing the concept of transformation towards sustainable development and resilience: ideas from systemic risk research</u>; Stefan Hochrainer-Stigler</p> <p><b>11:15</b> <u>The Interplay of Systemic Sociotechnical and Geopolitical Risks to Climate</u>; David Manheim</p> <p><b>11:30</b> <u>Social amplification of risk revisited - Risk perception and risk governance in the context of systemic risks</u>; Pia-Johanna Schweizer</p> <p><b>11:45</b> <u>Understanding and managing the systemic nature of risks: learnings from COVID-19</u>; Michael Hagenlocher</p> <p><b>12:00</b> <u>A comprehensive framework for mapping potential climate change impacts on fisheries socio-ecological systems</u>; Amanda Stoltz (withdrawn)</p>
12:15 – 13:00	Lunch break
13:00 – 13:25	<p><b><i>Keynote talk by Zinta Zommers</i></b> (Chair: <i>Jürgen Scheffran</i>)</p> <p><u><i>Systemic risk: Limits to governance?</i></u></p>
13:25 – 14:10	<p><b>Parallel session</b> (Chair: <i>Christian Franzke</i>)</p> <p><b>13:25</b> Introduction</p> <p><b>13:30</b> 3-min pitch from each presenter</p> <p><b>13:50</b> Break-out rooms</p> <p style="padding-left: 40px;"><b>Room1: <i>Impact metrics</i></b></p> <ul style="list-style-type: none"> <li>• <u>Reviewing burning embers from the 3 IPCC special reports in a homogenous framework</u>; Philippe Marbaix</li> <li>• <u>Contrasting biophysical and social impacts of hydro-meteorological extremes</u>; Rene Orth</li> </ul>

	<ul style="list-style-type: none"> <li>• <u>Risk Atlas of Colombia: Revealing the Latent Disasters</u>; Lina Dorado</li> </ul> <p><b>Room 2: Model evaluation</b></p> <ul style="list-style-type: none"> <li>• <u>Underestimated teleconnectivity in CMIP6 models restrains future global crop risks estimates</u>; Kai Kornhuber</li> <li>• <u>Modelling human-water systems experiencing drought-to-flood events: is there one model that fits all?</u>; Marlies Barendrecht</li> </ul> <p><b>Room 3: Compound events</b></p> <ul style="list-style-type: none"> <li>• <u>Assessing the nature of systemic risks and compound vulnerabilities</u>; Lisa Thalheimer</li> <li>• <u>Disentangling soil moisture and precipitation coupling over India from a compound flood risk assessment perspective</u>; Ashish Manoj</li> </ul>
14:10 – 14:20	Short Break
14:20 – 15:20	<p><b><i>Systemic risk models (Chair: Jana Sillmann)</i></b></p> <p><b>14:20</b> <u>Scaling behaviour in resilient social-ecological systems governance</u>; Isaak Mengesha</p> <p><b>14:35</b> <u>Long-term feedback mechanisms underlying societal collapse</u>; Sabin Roman</p> <p><b>14:50</b> <u>Using Bayesian Networks in Climate Storylines</u>; Taro Kunimitsu</p> <p><b>15:05</b> <u>The Paradox of Innovation on Systemic Risk: a System Dynamic model</u>; Francesco Bertolotti</p>
15:20 – 15:30	Short Break
15:30 – 16:15	<p><b><i>Deep Uncertainty (Chair: Alessio Ciullo)</i></b></p> <p><b>15:30</b> <u>The Value of Noise</u>; Benjamin Blanz</p> <p><b>15:45</b> <u>A Modelling Strategy for Living with Deep Uncertainty: Steps Towards Open, Contingent, Adaptive and Reactive Resilience</u>; Bruce Edmonds</p> <p><b>16:00</b> <u>Finding Diverse Future Scenarios in Complex Systems</u>; Patrick Steinmann</p>
16:15 – 16:30	Closing

## February 9 – Advances in Modeling Socio-Economic Impacts

10:15 – 10:20	Introduction (Christian Franzke)
10:20 – 10:45	<p><b>Keynote talk by Francesca Pianosi</b> (Chair: Christian Franzke)</p> <p><u><i>A better understanding of model uncertainties is possible</i></u></p>
10:45 – 12:00	<p><b>Modeling Floods and Droughts impacts</b> (Chair: Francesca Pianosi)</p> <p><b>10:45</b> <u>A Gradient Boosting Framework to Quantify the Effect of Behavior, Experience and Socio-economic Factors on Flood Resilience for the Continental US;</u> Nadja Veigel</p> <p><b>11:00</b> <u>Shifting faith of coastal economies: regional evolutionary agglomeration dynamics in face of climate-induced hazards;</u> Alessandro Taberna</p> <p><b>11:15</b> <u>Integrating farmers adaptation dynamics in drought risk modelling: assessing individual vulnerability dynamics under climate change and policies in Kenya;</u> Marthe Wens</p> <p><b>11:30</b> <u>Mainstreaming non-linear positive multi-attribute utility programming into multi-agent systems to explore water trading potential under transaction costs;</u> Francesco Sapino</p> <p><b>11:45</b> <u>Extreme weather events modelling projections: a case study of indirect social impacts in Brazil;</u> Rodrigo Rudge Ramos Ribeiro</p>
12:00 – 12:45	Lunch break
12:45 – 13:10	<p><b>Keynote talk by Tatiana Filatova</b> (Chair: Jürgen Scheffran)</p> <p><u><i>Computing Societal Dynamics in response to climate change</i></u></p>
13:10 – 14:05	<p><b>Parallel session</b> (Chair: Alessio Ciullo)</p> <p><b>13:10</b> Introduction</p> <p><b>13:15</b> 3-min pitch from each presenter</p> <p><b>13:45</b> Break-out rooms</p> <p style="text-align: center;"><b>Room1: Modeling indirect impacts</b></p> <ul style="list-style-type: none"> <li>• <u>The natural hazard risk to global critical infrastructure;</u> Sadhana Nirandjan</li> <li>• <u>Lifeline disruptions &amp; basic service losses - A globally consistent natural hazard impact model;</u> Evelyn Mühlhofer</li> <li>• <u>Effects of flood-induced individual businesses' financial distress over complex cooperative productive systems;</u> David Nortés Martínez</li> </ul> <p style="text-align: center;"><b>Room 2: Modeling social and ecological vulnerabilities</b></p> <ul style="list-style-type: none"> <li>• <u>Social vulnerability to climate disasters: if we can't model it well, can we at least model it usefully?;</u> Chris Fairless</li> <li>• <u>Vulnerabilities of a socio-ecological system through the lens of a bio-economic model;</u> Emily Quiroga</li> </ul>

	<ul style="list-style-type: none"> <li>• <u>Modelling Integrated Impacts of both Climate Change and Anthropogenic Disturbances on the Pasture Grazing Capacity and its Vulnerability in Mongolia</u>; Qinxue Wang</li> </ul> <p><b>Room 3: Modeling multi-hazards</b></p> <ul style="list-style-type: none"> <li>• <u>A study on Climate Related Hazards in Coastal Zones of Bangladesh</u>; Hasibun Naher</li> <li>• <u>A Multi-hazard Perspective on Joint Probabilities of Historic Hazards in Europe</u>; Judith N. Claassen</li> </ul> <p><b>Room 4: Modeling drought impacts</b></p> <ul style="list-style-type: none"> <li>• <u>A Science-Policy Assessment of the Effect of Severe Droughts Using A Decision-Theoretic Approach: Case study of Syria</u>; Rasha Hassam</li> <li>• <u>Assessing past and future drought vulnerability index over Khorasan-razavi province, Iran</u>; Iman Babaeian</li> </ul>
14:05 – 14:15	Short Break
14:15 – 15:00	<p><b>Modeling heat impacts on health (Chair: Zinta Zommers)</b></p> <p><b>14:15</b> <u>Projecting future myocardial infarction events under changing environmental and demographic conditions using Machine Learning</u>; Laurens Bouwer</p> <p><b>14:30</b> <u>Societal attention to heat waves can indicate public health impacts</u>; Ekaterina Bogdanovich</p> <p><b>14:45</b> <u>Demography and heat stress: the role of population dynamics in climate risk projections</u>; Iulia Marginean</p>
15:00 – 15:45	<p><b>Global impact modeling (Chair: Jana Sillmann)</b></p> <p><b>15:00</b> <u>Intergenerational inequalities in exposure to extreme events</u>; Wim Thiery (withdrawn)</p> <p><b>15:15</b> <u>Global Social-systems Modelling</u>; Mike Bithell</p> <p><b>15:30</b> <u>Combined machine learning and agent-based modeling for studying environmental migration dynamics</u>; Kelsea Best</p>
15:45 – 16:00	Short Break
16:00 – 16:50	<p>Parallel session (Chair: <i>Jürgen Scheffran</i>)</p> <p><b>16:00</b> 3-min pitch from each presenter</p> <p><b>16:30</b> Break out rooms:</p> <p><b>Room 1: Multi-criteria and uncertainty analysis for impact models</b></p> <ul style="list-style-type: none"> <li>• <u>Uncertainty and sensitivity analysis for natural hazard risk and adaptation appraisal modelling with CLIMADA- no more excuses</u>; Chahan Kropf / Alessio Ciullo</li> <li>• <u>Climate proofing of economic activities. A case study in the Dolomite</u>; Carlo Giupponi</li> </ul> <p><b>Room 2: Modeling human-water interactions</b></p>

	<ul style="list-style-type: none"> <li>• <u>Modelling the human-climate feedback at different spatial-temporal scales</u>; Maurizio Mazzoleni</li> <li>• <u>A complex systems perspective on changing flood risks</u>; Andreas Paul Zischg</li> <li>• <u>Assessing the Risk and Vulnerabilities associated with the flood and COVID-19 as a compound event by using different modeling techniques in a socio-environmental system</u>; Jagriti Jain</li> </ul> <p><b>Room 3: <i>Modeling impacts in the transition to a green economy</i></b></p> <ul style="list-style-type: none"> <li>• <u>Modelling urban transition from conventional to a green economy</u>; Jiaqi Ge</li> <li>• <u>Mitigation and Adaptation Emissions Embedded in the Transition to a Stable Climate</u>; Corey Lesk</li> </ul> <p><b>Room 4: <i>Modeling hurricane impacts</i></b></p> <ul style="list-style-type: none"> <li>• <u>Skilful predictions of multi-year US hurricane damages by decadal prediction systems</u>; Julia Lockwood</li> <li>• <u>Advancing joint modeling of tropical cyclone wind, surge and rain impacts – now and in a changing climate</u>; Simona Meiler</li> </ul>
16:50 – 17:00	Closing

<b>February 10 – Resilience and Adaptation</b>	
10:00 – 10:05	Introduction ( <i>Jürgen Scheffran</i> )
10:05 – 10:30	<b>Keynote talk</b> by <i>Roger Cremades</i> (Chair <i>Jürgen Scheffran</i> )  <u><i>Understanding the Global Metabolism of Risk</i></u>
10:30 – 11:30	<b><i>Integrated systems</i></b> (Chair: <i>Alessio Ciullo</i> )  <u>10:30 Contextualizing cross national patterns in household climate change adaptation;</u> Brayton Noll  <u>10:45 Adaptation and resilience in regional hot spots of the climate-security nexus; Tipping between conflict and cooperation in human-environment interaction;</u> Jürgen Scheffran  <u>11:00 Exploring the scope and strategies for achieving resilient and adaptive infrastructure in Africa: Materials, methods and the political economy;</u> Innocent Chirisa (withdrawn)  <u>11:15 Two unconventional projects aiming to address the root causes of disasters in South East Asia;</u> Andres Payo
11:30 – 11:45	Short break
11:45 – 13:00	<b><i>Risk and resilience in geographical spaces (land - urban - coast)</i></b> (Chair: <i>Jürgen Scheffran</i> )  <u>11:45 Coastal community resilience index- A systemic framework for cascading and compounding risk;</u> Bapon Fakhruddin  <u>12:00 Adaptive decision-making in an urban-coastal agent modeling framework;</u> Shubhankar Sengupta  <u>12:15 Compound risks and challenges for governing resilience in cities;</u> Sara Mehryar  <u>12:30 Risk and resilience of Australian agri-food supply chains;</u> Firouzeh Taghikha  <u>12:45 Quantifying school community resilience in Nepal;</u> Maria Xanthou
13:00 – 14:00	Lunch break
14:00 – 15:00	<b><i>Flood risk and resilience</i></b> (Chair: <i>Tatiana Filatova</i> )  <u>14:00 Record rainfall, swelling rivers: Households' behavior and expectations in the wake of the 2021 European floods;</u> Sofia Badini (withdrawn)  <u>14:15 Flood transport resilience: Exeter case study;</u> Maria Pregnolato  <u>14:30 Predicting adaptive behaviour of flood prone residents in an agent-based modelling approach;</u> Lisa Berghäuser  <u>14:45 Unraveling the complexity of human behavior and urbanization on community vulnerability to floods;</u> Mona Hemmati
15:00 – 15:15	Short Break
15:15 – 15:45	<b><i>Insurance &amp; strategies</i></b> (Chair: <i>Roger Cremades</i> )

	<p><b>15:15</b> <u>The role of the "Insurance value of nature" in climate and extreme weather adaptation</u>; Paul Hudson</p> <p><b>15:30</b> <u>The potential for a novel bond to safeguard communities against future locust outbreaks</u>; Michael Hinge</p>
15:45 – 16:30	<p><b><i>WCRP Lighthouse Activities (Chair: Jana Sillmann)</i></b></p> <p><b>15:45</b> <u>The WCRP Safe landing climates lighthouse</u>; Gabriele Hegerl</p> <p><b>16:00</b> <u>My Climate Risk</u>; Regina R. Rodrigues</p> <p><b>16:15</b> <u>The WCRP Academy</u>; Chris Lennard</p>
16:30 – 17:00	Final discussion ( <i>Chair: Jana Sillmann</i> )