JPL Workshop on Usable Climate Risk Science

October 28-30, 2024

Jet Propulsion Laboratory
4800 Oak Grove Drive, Pasadena CA 91109

Organizers: Amy Clement (U. Miami), Andy Dessler (Texas A&M), Alex Hall (UCLA), Jessica Neu (JPL), Adam Sobel (Columbia)

Day 1 - 10/28/2024, Monday

830a-900a **Introduction**

Welcome & framing remarks from organizing team (30m)

Session 1

900a-1030a **View from the Impact Community,** *Moderator - Adam Sobel*

Where do they see good science emerging at the interface of climate science and system impacts? What are examples where the impact modeling has shaped the climate analysis? How can we encourage even more of a two-way street?

Introductory remarks (900a-1000a):

Kelly Hereid - **"Where are the biggest gaps between climate model outputs and the data products needed for adaptation?"**

Jayanatha Obeysekera - "**Integrating Climate Science and Adaptation Planning: Research Gaps"**

Jennifer Jurado **- "Climate Science, Resilience Planning, and the Business Case for Adaptation in southeast Florida"**

Daniel Kirk-Davidoff – **"Climate Hazard, Exposure, and Vulnerability Assessment in the Energy Sector"**

1000a-1030a - **Discussion**

1030a-1100a **Break**

Session 2

1100a-1230p **View from NASA/JPL,** *Moderator - Jessica Neu*

1100a-1115a Michelle Hawkins - **"Harnessing NASA's Earth Science for Stronger, Climate-Resilient Communities"**

1115a-1130a Duane Waliser - **"Overview of JPL's Climate Science and Decision-Support Activities"**

1130a-1145p Dave Schimel **– "Climate risks and future tipping points: implications for fine scale projections"**

1145p-12:00p Christine Lee **– "Building Climate Resilience through a Robust Earth Science Profession"**

1200p-1230p **Discussion**

1230p-130p **Lunch**

Session 3

130p-300p **Emerging Observational Tools,** *Moderator - Simona Meiler*

What are the emerging observational products to support improved usable climate risk science? What is the infrastructure needed to develop these observational products? What are the products' uses and biases? How are they used for detection and attribution of landscape/watershed scale compounding and cascading impacts of climate change?

130p-145p Karen McKinnon – **"Quantifying the certain uncertainty of climate trends and extremes due to internal variability"**

145p-200p Michelle Gierach - **"Life at the edge: Science and applications needs at the coastal interface"**

200p-215p Madeleine Pascolini-Campbell **– "Remote sensing for assessing wildfire risk and recovery**

215p-230p Cedric David - **"Making Satellite Surface Water Hydrology Actionable for Science and Society"**

230p-300p **Discussion**

3:00-3:30 **Break**

Session 4

330p-530p **Bridging scales of GCMs and landscapes,** *Moderator - Colin Raymond*

What are the various techniques used to produce high resolution future climate data? What is known about their strengths and weaknesses? How can we develop more confidence in critical near-surface variables? Can we develop best (or better) practices than data dumping?

330p-345p Andy Jones – **"From Storylines to Anthologies: Scaling up the thermodynamic global warming approach for projecting climate influences on regional extreme events"**

345p-400p Keith Dixon - **"Matching Downscaled Climate Projections to Application Needs: The 'Fit for Purpose' Question"**

400p-415p Joao Teixeira **- "The role of the boundary layer in predicting climate risk"**

415p-430p Stefan Rahimi - "**Bias correction in dynamical downscaling: Friend or foe?"**

430p-500p **Discussion**

Day 2 - 10/29/2024, Tuesday

Session 5

830a-1000a **Research in the Climate Science / Impact Space 1,** *Moderator - Jane Baldwin*

What scientific questions emerge from research being at the interface of climate science and impacts, as we move from hazards to risks and work with diverse decision makers?

830a-845a Kimberly Miner**- "Climate change science application across scales"**

845a-900a Alex Ruane **- "How climatic impact-drivers bring us closer to risk-focused and impacts-relevant climate information"**

900a-915a Fran Moore – **"Applying a Value of Information Framework to Climate Adaptation and Risk Management Decision Making"**

915a-930a James Done – "**A Convergence Science Approach for Producing Actionable Climate Information"**

930p-1000p **Discussion**

1000a-1030a **Break**

Session 6

1030a-1200a **Developments and Needs in Modeling,** *Moderator - Deepti Singh*

What are the modeling advances/opportunities/challenges relevant for the layer of science between GCMS and users?

1030a-1045a Tapio Schneider – **"Bridging the Gaps: Climate Models, AI, and Actionable Climate Intelligence"**

1045a-1100a Ruby Leung – **"Earth System Modeling for Actionable Science"**

1100a-1115a Renato Braghiere **– "Advancing Process-Based Models for Actionable Climate Risk Assessments"**

1115a-1130a Paul Ullrich **– "Bringing Together the Modeling Ecosystem to Build Confidence in Future Projections."**

1130a-1200p **Discussion**

1200-100p **Lunch**

Session 7

100p-230p **Standards in Climate Data Quality and Accessibility**

Group discussion (Alex Hall and Jessica Neu, moderators)

How do we create scientific standards around climate data production to support understanding of climate risk? How do we promote public accessibility of high quality data? What lessons do we have from CMIP data production and international organization? How do we introduce scientific analysis into the conversation about data production? How do we prevent bad actors from dumping low quality data into the stakeholder space?

230-300p **Break**

Session 8

300p-500p **Climate Science at the Landscape Scale,** *Moderator - TBD*

As we produce information about hazards, what new climate science has emerged?

300p-315p Paul Loikith – **"How Studying the June 2021 Pacific Northwest Heat Wave Has Advanced Climate Science"**

315p-330p Justin Mankin **- "The Scientific Case for Climate Liability"**

330p-345p Nick Siler **- "The effect of mountains on future precipitation change: insights from high-resolution simulations over the western US"**

345p-400p Deepti Singh **– "Climate information at spatial and temporal scales relevant for informing impacts and adaptation: contexts from pastoral and rural communities in East and South Africa"**

400p-415p Anamika Shreevastava **- "Extreme heat and cities"**

415p-500p **Discussion**

Day 3 - 10/30/2024, Wednesday

Session 9

830a-1030a **Research in the Climate Science / Impact Space 2,** *Moderator - Stefan Rahimi*

What scientific questions emerge from research being at the interface of climate science and impacts, as we move from hazards to risks and work with diverse decision makers?

830a-845a Bob Kopp **- "Sea-level rise projections as a case study of science integration and translation"**

845a-900a Simona Meiler – **"Turning Uncertainty into Insights: Quantifying and Attributing Uncertainties in Climate Risk Modeling"**

900a-915a Jane Baldwin **– "Projecting Heat Extremes and their Health Risks in a Changing Climate"**

915a-930a Ben Hamlington **– "Sea level rise decision support"** (placeholder title)

930a-945a JT Reager – **"Cascading impacts of climate change and human activity in California's water cycle"**

945a-1030a **Discussion**

1030a-1100a **Break**

Session 10

1100a-1230p **Scientific frontiers for Actionable Science,** *Moderators - Amy Clement, Andy Dessler*

From the perspective of the impact community, what is missing in the activities discussed, i.e. observations, bridging the scales from GCM to landscape/watershed, model development, climate science / impacts research, climate science at the landscape scale? What are the big gaps and opportunities? What are the big new exciting science questions?

1230p-130p **Lunch**

Session 11

130p-300p **Keeping this effort going,** *Moderators - Adam Sobel, Fran Moore*

Group discussion & Strategizing on next steps

How do we catalyze this community? What concrete products should come from this workshop, and who will execute on them? Articles, Upcoming events, e.g. AGU sessions.

300p-530p **Break and JPL tour**

530p Adjourn