

METCALF INSTITUTE FOR MARINE & ENVIRONMENTAL REPORTING
20th Annual Science Immersion Workshop for Journalists
Global Impacts: Climate Change and Extreme Weather
June 10-15, 2018

Sunday, June 10

Science From the Ground Up

3:30 p.m. **Fellowship Convenes**

3:30-4:30 **Orientation** (Hampton Inn South Kingstown Conference Room)
SUNSHINE MENEZES, KATHARINE MCDUFFIE, Metcalf Institute
Introduction to Metcalf Institute, the Annual Science Immersion Workshop,
the 2018 Metcalf Fellows, and overview of activities and goals for the week.

5:15 Depart for Trio (Hampton Inn entrance)
Fellows will travel in 12-passenger van to restaurant.

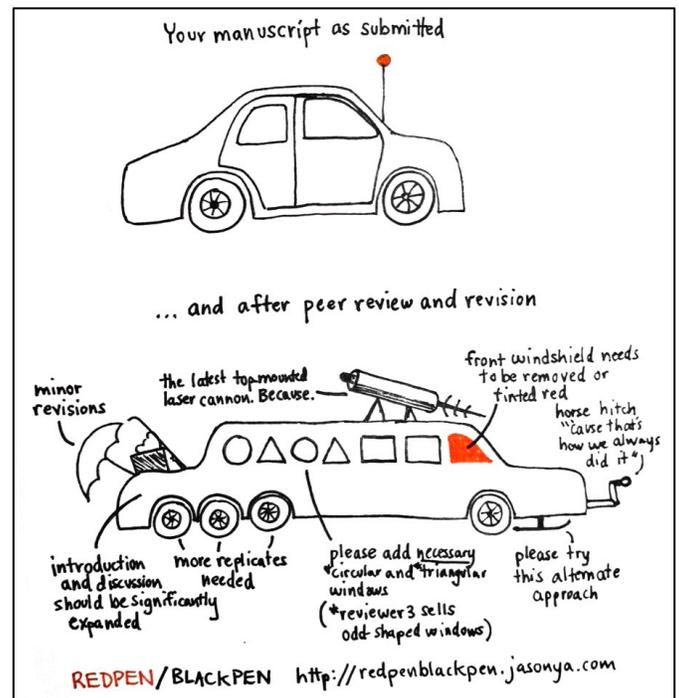
5:30-6:30 **Presentation and Discussion**
Trio Private Dining Room (50 Kingstown Road, Narragansett, RI (401) 792-4333)

The Building Blocks of Scientific Knowledge
SCOTT MCWILLIAMS, URI College of Environment and Life Sciences; SUNSHINE MENEZES,
Metcalf Institute; TATIANA RYNEARSON, URI Graduate School of Oceanography

“Science, my lad, is made up of mistakes,
but they are mistakes which
it is useful to make, because they lead
little by little to the truth.”
Jules Verne,
Journey to the Center of the Earth

Although scientists see peer review, which occurs prior to receiving federal research funding and again before the publication of a study, as an essential stage in the development of scientific consensus, the average news consumer has no knowledge of the process. Familiarity with the different stages of scientific inquiry is critical to understanding the culture of science.

Presenters will review the culture and practice of science, ranging from the identification of research questions and steps for securing funding to the peer review process and the role of scientific uncertainty.



6:30-7:30 Dinner

7:30 Van departs for Hampton Inn

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Monday, June 11

Communicating the Knowns and Unknowns of Climate Change

Checklist: Metcalf workbook
completed Sunday survey
comfortable clothing and footwear
sweater/fleece for air conditioning

Breakfast service begins at 6 a.m. in the lobby of the Hampton Inn. A packed breakfast-to-go is also available on request at the Front Desk. Fellows should be ready at the entrance at least a few minutes before departure time each day as noted on the daily agendas. The Metcalf van will arrive 10-15 minutes prior to departure and wait at the entrance. The van will depart at the time designated on the agenda.

6:00-8:30 a.m. Breakfast available (Hampton Inn)

8:40 Van departs for GSO (Hampton Inn front entrance)

9:00-10:15 **Presentation and Q&A** (GSO Coastal Institute Large Conference Room)

Introduction to Climate Change

BECKY ROBINSON, URI Graduate School of Oceanography (GSO)

Climate change is a significant aspect of modern day *global change*, a broad suite of human impacts on the environment. This session will set the stage for our explorations of the science and implications of climate change over the course of this week.

10:15-10:25 Break

10:25-12:30 p.m. **Science Translation I** (CI Large Conference Room)

10:25-11:40 *Graphing for Communication of Complex Data*

COLIN JONES, URI GSO

Data visualization is essential for communicating scientific results clearly. This session will introduce a range of graphical approaches used by scientists, from the simplest x/y plots to complex multi-variable figures, and identify the value of different approaches for specific purposes. Fellows will apply this knowledge in a set of informal challenges to interpret more complex graphs.

11:45-12:45 *The Journalist's Guide to Understanding and Explaining Probabilities*

BRIAN GERBER, URI Department of Natural Resources Science

Policy decisions about global change are made, like most policy decisions, based on the risks of various outcomes for public health, economic security, and/or environmental protection. Yet very few people actually understand the probabilistic mathematics involved in climate models, the methods scientists use to constrain their uncertainty about a certain result, or even what "probability" really means. This session will provide a primer on probabilities, confidence levels, and some basic statistical concepts that are often miscommunicated. This discussion is intended to increase confidence in digging into, and questioning, the numbers in scientific papers, government reports, and organizations' press releases.

12:45-1:30 Lunch (CI Large Conference Room and Outdoor Terraces)

- 1:45-3:00 **Science Translation II** (CI Large Conference Room)
Deconstructing a Scientific Publication
METCALF FELLOWS; NELLE COURET, URI Biological Sciences; LESLEY-ANN DUPIGNY-GIROUX, University of Vermont; AFONSO GONCALVES, URI GSO; NYLA HUSAIN, URI GSO; DAVID SMITH, URI GSO
For this Science Translation session, Fellows will partner with scientists in five groups, with two journalists and one scientist in each group. Using a pre-assigned paper as a model, scientists will review the structure of the published paper and present tips and tools that can be used to read and effectively “translate” a science journal article while on deadline. Assigned papers are inserted in the Fellows’ workbooks in the Monday divided section. If there is sufficient time, journalists and scientists will exchange ideas about how to interpret the main ideas of the paper for news audiences. At the end of the exercise, each journalist will share a translation tip learned during the session.
- 3:00-3:15 Break (CI Large Conference Room)
- 3:30-4:30 **Public Lecture** (GSO Corless Auditorium)
Extreme Weather and Climate Change: What’s the Connection?
LESLEY-ANN DUPIGNY-GIROUX, University of Vermont
Record heat waves, storms, and unusually large hurricanes have catastrophic impacts on people and infrastructure. Dupigny-Giroux will explain how scientists approach uncertainty in the research that connects extreme weather and our changing climate, while sharing the latest scientific insights on these disruptive weather patterns.
- 4:30-5:30 Public Reception (GSO Watkins Laboratory Foyer)
Celebrating Metcalf Institute’s 20th Anniversary
- 5:45 Van departs for dinner (Coastal Institute entrance)
- 6:00 Dinner
Tong-D (50 South County Commons Way, South Kingstown (401) 783-4445)
Fellows will be in walking distance of the Hampton Inn

METCALF INSTITUTE FOR MARINE & ENVIRONMENTAL REPORTING
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Tuesday, June 12

Science to Guide Climate Change Planning & Response

Checklist: Metcalf workbook
completed Monday survey
raingear in case of rain
boat footwear
socks to wear under waders
change of clothing
sweater/fleece

8:45-9:45 **Presentation and Q&A** (Hampton Inn Conference Room)

Climate Impacts in Coastal Zones: Sea Level Rise

SIMON ENGLEHART, URI Geosciences

A primary concern of warming temperatures is the rise of global sea levels. Recent studies have significantly increased projected rates of sea level rise, with worst-case scenarios exceeding two meters by 2100. Englehart will describe the drivers of these projections, explain the occurrence of regional “hot spots” with greater than average increases in sea level, and discuss the implications of these changes for coastal zones.

9:50 Van departs for Charlestown Breachway (Hampton Inn entrance)

10:20-12:00 **Fieldwork** (South Shore Management Area)

Restoration of Coastal Wetlands Under Sea Level Rise

CAITLIN CHAFFEE, R.I. Coastal Resources Management Council; TOM KUTCHER, Save the Bay;
STEVE MCCANDLESS, Town of Charlestown;

DANIELLE PERRY, URI Biological & Environmental Sciences

Healthy coastal wetlands function as nursery habitats for commercially important species, absorb greenhouse gases from the atmosphere, and serve as natural barriers that moderate the effects of coastal storms. These valuable ecosystems (also referred to as salt marshes) have been the focus of extensive restoration efforts in recent decades to restore their natural functions after centuries of damage from human activities. Sea level rise and coastal erosion from stronger storms pose additional threats to coastal wetlands, leading to new approaches for restoration and monitoring projects.



Image Credit: Don Bosquet

10:20-10:35 Participants will be transported across the Charlestown Breachway to the adjacent Rhode Island South Shore Management Area.

10:35-12:00 The group will disembark at a site undergoing a federally-funded restoration project to raise marsh surface elevations and restore a nearby barrier beach via the placement of dredged material from the adjacent channel. The goals of the project are to allow the marsh, which has been drowning in place because of the high regional rates of sea level rise, to re-vegetate and re-establish a diverse community of habitats that will benefit sensitive, marsh-obligate species and build resilient coastal buffers.

Fellows will be divided into three groups for demonstrations of various data collection methods and will then collect their own data. One station will be focused on marsh vegetation diversity and abundance, including plant community composition, species abundance, and plant height. The second station will be focused on geospatial data collection using a Real Time Kinematic (RTK) receiver to collect elevation data and a Trimble Geo7 GPS unit to collect horizontal data and map different zones on the marsh surface. Nekton sampling using a throw trap will be the focus of a third station. The groups will then convene to discuss the uses and implications of these data for the project and the marsh system in general.

- 12:00-12:15 Transfer by boat to DEM Boat Launch.
- 12:20 Van departs for GSO
- 12:50-1:40 Lunch (CI Large Conference Room and Terraces)
- 1:45-3:00 **Discussion** (CI Large Conference Room)
Shop Talk: Meeting the Challenges of Communicating Uncertainties in Climate Change
AMIR JINA, University of Chicago; JOHN UPTON, Climate Central
Journalists and scientists share a common professional norm: gather and provide facts and let others draw conclusions. Audience perception of those facts varies depending on individuals' experiences, values, and biases. The challenge of reporting the science, economic, and policy implications of climate change, then, has an added layer, as the language of climate change also varies by audience, from local to global scales. These panelists bring expertise in framing climate change and scientific uncertainty for different audiences. This session is an opportunity to explore the challenges of reporting climate change and extreme weather, discuss tips for identifying the best sources, and consider novel approaches for covering these topics.
- 3:00-3:15 Break
- 3:30-4:30 **Public Lecture** (Corless Auditorium)
The Bottom Line: Climate Change and the American Economy
AMIR JINA, University of Chicago
The U.S. suffered an estimated \$300 billion in economic losses from extreme weather events in 2017. Climate change affects the economy in many ways, from agricultural yields to electricity demand and mortality. Jina will present the work of the Climate Impact Lab, which uses big data to forecast future damages from these impacts and inform effective fiscal policies.
- 4:30-5:15 Public Reception (Watkins Laboratory Foyer)
Celebrating Metcalf Institute's 20th Anniversary
- 5:15-6:45 Reception and Dinner (Nautilus Galley, GSO Ocean Science and Exploration Center)
Overview of Wednesday's activities
- 6:45 Van departs for Hampton Inn (OSEC entrance)

METCALF INSTITUTE FOR MARINE & ENVIRONMENTAL REPORTING
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Wednesday, June 13

Long-Term Research: Establishing Baselines & Detecting Anomalies

Checklist: Metcalf workbook
completed Tuesday survey
non-skid shoes with closed toe
clothing that can get wet
rain gear
change of clothing
sweater/fleece

8:30 a.m. Van departs, rain or shine, for Rhode Island Department of Environmental Management, Marine Fisheries Section headquarters at Fort Wetherill in Jamestown, RI (Hampton Inn front entrance)

9:00-11:35 **Fieldwork** (Narragansett Bay)
Assessing the State of Coastal Fisheries
CHRISTOPHER PARKINS, RI DEM; JOE LANGAN, URI GSO; JACOB STROCK, URI GSO
Fellows will gain an appreciation for a long-term data series by participating in a fish trawl modeled after the Rhode Island Department of Environmental Management (DEM) Division of Marine Fisheries Coastal Trawl Survey. The coastal trawl survey consists of two components a seasonal survey and a monthly survey. The seasonal survey is a fisheries resources assessment of Narragansett Bay, Rhode Island Sound and Block Island Sound and has been ongoing since 1979. The monthly survey is a fisheries resource assessment of Narragansett Bay and began in 1990. The data collected by these surveys is used for statewide and regional stock assessments and by partners who are researching and monitoring the health of the Rhode Island marine ecosystem.

9:00 a.m. Arrive RI DEM Marine Fisheries Jamestown, RI Laboratory and board the R/V John H. Chafee. Captain Patrick Brown will review the vessels safety guidelines, Parkins will explain the trawls function and the significance of the time series and data collected. Langan will discuss the complimentary URI GSO trawl and how it is used. Strock will explain the GSO plankton time series and uses of these data.

9:15 – 11:45 Depart for fisheries trawl in Narragansett Bay. Steam to East Passage of the bay, south of Gould Island and north of the Newport Bridge. Fellows will assist in collecting environmental and oceanographic data as per the coastal trawl protocol. At our destination, Parkins and Langan will demonstrate trawl deployment. Upon retrieval of the trawl, Fellows will help sort and identify species, take measurements, collect weights and logging the catch data. Parkins and Langan will discuss how these data reflect the ecology of Narragansett Bay and the impacts of global change and how the data can be analyzed to inform fisheries management. Strock will demonstrate how to collect a plankton sample.

11:55 Van departs for GSO.

12:15-1:00 p.m. Lunch (CI Large Conference Room)

A Window into the Sea (CI Large Conference Room)
Microscopes will be available during the lunch break for viewing phytoplankton and zooplankton common to Narragansett Bay.

- 1:00-2:00 **Presentation and Q&A** (CI Large Conference Room)
Ocean-Climate Feedbacks: Using Models to Improve Understanding of Environmental Change
ISAAC GINIS, JAIME PALTER, URI GSO
The ocean and climate systems are intricately linked via physical, chemical, and biological processes. This session will explore these interactions to clarify how basic oceanographic and climatological processes are, or could be, affected by climate change, and how models are used to investigate the feedbacks. Speakers also will describe major climate change research questions related to ocean circulation and hurricane frequency and intensity.
- 2:00-3:00 **Presentation and Exercise** (CI Large Conference Room)
What to Do with All Those Data?
REBECCA ROBINSON, URI GSO
This session will increase your ability to find and access scientific data relating to climate change to aid in your reporting. Using publicly available data from Google Earth, NASA, and NOAA, Fellows will explore several climate databases, download data, and experiment with tabulating, graphing, and/or mapping the data.
- 3:00-3:15 Break
- 3:30-4:30 **Public Lecture** (Corless Auditorium)
Is Immersive Storytelling the Future of Journalism?
JEAN YVES CHAINON, JYC and OOAworld
Virtual reality, augmented reality and 360 video are transforming the way storytellers and journalists engage news audiences in a wide range of topics including climate change. Merging cutting edge technology and immersive storytelling, Chainon, former VR Producer at The New York Times and leader in the use of AR, VR, and 360° videos and, will describe how content creators can use these tools to bring audiences closer to the issues they cover.
- 4:30-5:15 Public Reception (Watkins Laboratory Foyer)
Celebrating Metcalf Institute's 20th Anniversary
- 5:15-6:45 Reception and Dinner (Nautilus Galley, GSO Ocean Science and Exploration Center)
Overview of Thursday's activities
- 6:45 Van departs for the Hampton Inn (OSEC front entrance)

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Thursday, June 14

Communicating Risk in the Face of Uncertainty

Checklist: Metcalf workbook
completed Wednesday survey
flat shoes with closed toe
comfortable clothing
sweater/fleece

- 8:30 a.m. Van departs for FM Global research campus, West Greenwich (Hampton Inn front entrance)
- 9:30-11:45 **Facility/Lab Tour** (FM Global Research Campus, 743 Reynolds Road, West Gloucester)
Climate Change: Can Property be Protected in the Face of Emerging Risks?
VICTOR JAWORSKI, KATHERINE KLOSOWSKI, FM Global
As the climate changes, there's potential for increased natural hazards and fires worldwide—some caused by Mother Nature and others caused by humans. How should the impact to businesses be planned for? Fellows will learn about the work done to answer this question at the FM Global Research Campus, the world's largest center for property destruction and science-based engineering solutions. Fellows will witness the forces of nature and a building on fire, replicated in the FM Global labs, to better understand how businesses and property owners can deal with these hazards.
- 11:45-12:30 p.m. Lunch
- 12:40 Van departs for GSO.
- 1:45-3:00 **Science Translation III** (CI Large Conference Room)
Telling the Science Story
METCALF FELLOWS; NELLE COURET, URI Biological Sciences; AFONSO GONCALVES, URI GSO; NYLA HUSAIN, URI GSO; DAVID SMITH, URI GSO; AMY SNOVER, University of Washington
For the final Science Translation session, Fellows will again gather in five groups. Building on the science translation tools identified on Monday and with the help of participating scientists, Fellows will read and translate a science journal article and identify one or two key conclusions from the paper. Fellows will then take the lead to help scientists identify a news hook for the article and develop a pitch they might make to a reporter to spur interest in covering the paper. At the end of the exercise, each team will share outcomes with the full group. The journalists will summarize the conclusions of the scientific journal article, and the scientists will give a brief pitch for a news story relating to those conclusions. Assigned papers are inserted in the fellowship workbook in the Thursday section.
- 3:00-3:15 Break
- 3:30-4:30 **Public Lecture** (Corless Auditorium)
How Will We Handle a World With No "Normal"? Preparing for a Changing Climate
AMY SNOVER, University of Washington
Extreme weather events in coastal communities cause flooding and coastal erosion, damage infrastructure, and put people at risk. To plan for future climate risks, we must challenge deeply held assumptions about the stability of our global climate that are embedded in our laws and institutions. Snover will discuss new collaborations between scientists and local decision-makers that will help communities thrive in this era of uncertainty

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| 4:30-5:00 | Public Reception (Watkins Laboratory Foyer) <i>Celebrating Metcalf Institute's 20th Anniversary</i> |
| 5:00 | Van departs for Newport (CI front entrance) |
| 5:30-5:50 | Group photo (Newport location) |
| 6:00-8:30 | Private reception and dinner Cru Café 1 Casino Terrace, Newport (401) 314-0500 |
| Time TBD | Van departs for Hampton Inn (Location of departure from Newport TBD) |

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Friday, June 15

Helping Your Audience Connect with Climate Change & Extreme Weather

Checklist: Metcalf workbook
luggage
completed Thursday survey
completed Friday survey

Check-out from Hampton Inn by 8:30 a.m. with luggage ready to load into the van.

All Daily Surveys are due prior to departure.

- 8:35 a.m. Van and drivers depart for GSO (Hampton Inn entrance)
- 8:50 Arrive at GSO Coastal Institute. Drivers may park anywhere on campus without permit.
- 9:00-10:00 **Presentation and Q&A** (CI Large Conference Room)
Crazy Weather and the Arctic Meltdown: How They Are Connected
JENNIFER FRANCIS, Rutgers University
As extreme weather events affect an ever-wider range of locations around the globe, scientists are trying to identify whether and, if so, how the apparent trend toward more of these events is related to climate change. This scientific effort relies upon observations, experimentation and computer modeling to resolve the significant uncertainties inherent in global-scale environmental change. Francis will discuss one aspect of the climate system that has led her and her colleagues to hypothesize that melting of polar ice is affecting atmospheric circulation in the Northern Hemisphere, leading to a “wavier” pattern in the jet-stream that may be driving some extreme weather events.
- 10:00-10:30 **Discussion** (CI Large Conference Room)
Shop Talk: Reporting on Climate Change
METCALF FELLOWS; AUSTIN BECKER, URI Marine Affairs; KAREN BORDELEAU, Emerson College; JENNIFER FRANCIS, Rutgers University; CHRISTINE WOODSIDE, Author and Editor; CORNELIA DEAN, Brown University; RICHARD MOSS, Columbia University
This final session is an opportunity for Fellows to discuss lingering questions and ideas regarding their approaches toward covering global change stories as a result of the Metcalf Workshop.
- 10:30-10:45 Break, final group photo opportunity
- 11:00-12:00 **Public Lecture** (GSO Corless Auditorium)
Sparking a Transition to Local Leadership for Climate Action
RICHARD MOSS, Columbia University
Researchers, resource managers, and local climate practitioners are developing new strategies for managing climate change impacts. Moss, former chair of the disbanded Federal Advisory Committee for the Sustained National Climate Assessment (NCA), will preview an independent advisory committee’s recommendations for ways the NCA, our nation’s definitive source for information on the impacts of global environment change, could accelerate innovation in climate science to support climate action.
- 12:15-1:15 p.m. Luncheon (CI Hazard Seminar Room)
- 2:00 All Daily Surveys Due ~ **Fellowship Concludes**
Van departs for public transportation depots per schedule (CI front entrance)
- 1:30-4:00 **Optional Tours**