

NOAA Center for Earth System Sciences and Remote Sensing Technologies (CREST) and NOAA/OAR/ESRL/PSD: Research & Education Collaboration Meeting

Monday August 13 - Wednesday August 15, 2018
NOAA Earth System Research Laboratory, Boulder CO
([Directions](#) are here)

Meeting Goal:

Engagement of the NOAA ESRL scientists, leadership/management in creating and/or enhancing existing research and educational collaborations focused on water cycle and resource issues with NOAA Cooperative Science Centers students, faculty and researchers- including NOAA-Center for Earth System Sciences and Remote Sensing Technologies (www.noaacrest.org) and other CSCs.

Desired Outcomes:

- Engagement of NOAA scientists/researchers in the existing CREST science/research plan
 - Identify new areas of research and education/training that are of mutual interests and align with NOAA, OAR/ESRL and CREST priorities and missions
 - Create joint seminar series - or engage in the existing seminar series
 - Create NOAA Experiential Research and Training Opportunities (NERTO) for Cooperative Science Centers (CSC) funded students at the NOAA facilities within ESRL and/or NOAA/NWS/NWC
 - Write joint proposal in response to internal and external solicitations
 - Explore options of joint- post-doctoral opportunities
 - Co-host future AMS and AGU sessions on mutually interested NOAA research priorities.
-

Meeting Agenda

Monday August 13

- 9:30 am: Meet in front lobby of the NOAA building

Room 1D708

- 9:45-10:00 am: Welcome and introductions
- 10:00-10:15 am: [ESRL background and overview](#) (Robin Webb)
- 10:15-10:30 am: Discuss meeting objectives and outcomes (Rob Cifelli)
- 10:30-10:45 am: Discuss NERTO process - past experiences, how process works, timelines (Shakila Merchant)
- 10:45-11:00 am: Break
- 11:00-12:30 pm: Round 1 CREST presentations on current research activities and interests
- 12:30-1:30 pm: Lunch

Front lobby of NOAA building

- 1:30-3:30 pm: ESRL building tour
- 3:30-3:45 pm: Break

Room 1D708

- 3:45-4:15 pm: Round 2 CREST presentations by the CSC funded graduate students (Aris Fernandez, Carlos Wah Gonzalez (virtual), Equisha Glenn, David Melecio Vasquez, Jean Pierre Velle)
- 4:15-5:00PM End of day wrap-up
- 6:00 pm: Dinner TBD

Tuesday August 14

Room 1D708

- 9:00-10:30 am: Overview of PSD research (Robin Webb) and 1st round of PSD research presentations with emphasis on National Water Model and food security activities (1D-708)
 - Robin W. - Overview of PSD research
 - Rob C. and Lynn J. - Advanced Quantitative Precipitation Information
 - Kelly M. - Hydrologic forcings for National Water Model
 - Jungho K. - National Water Model in SF Bay Area
 - Bob Z. - Soil moisture obs and National Water Model comparisons
- 10:30-10:45 am: Break
- 10:45 am-12:30 pm: Round 2 PSD research presentations and discussion
 - Roger P. - Drought, food security, and water security
 - Mimi H. - National Water Model prototype for drought soil moisture anomalies

- Mike H. - Reference ET Analysis and EDDI
- Andy H. - FEWS-NET and how we advise on food security
- Rob C. - Bureau of Reclamation project to evaluate the National Water Model
- 12:30-1:30 pm: Working lunch - CREST to have group discussion with directors of the three other ESRL divisions (GSD, GMD, CSD)
- 1:30 pm-3:30 pm: Small group discussions - brainstorming of initial thoughts on areas of potential collaboration
- 3:30 pm-3:45 pm: Break
- 3:45-5:00 pm: Discuss use of observations for evaluations and physical process understanding in PSD and CREST research

Wednesday August 15

Room 1D708

- 9:00-10:30 am: Continued research discussions and synthesis of ideas with the goal of fleshing out one or more internship/postdoc projects that are of mutual interest to PSD and CREST
- 10:30-10:45 am: Break
- 10:45 am-12:30 pm: National Water Model overview - demonstrating PSD research using the NWM
- 12:30-1:30 pm: Lunch
- 1:30 pm-3:00 pm: Discuss joint proposal opportunities, seminar series, and hosting of future AMS/AGU sessions on NWM and food security issues
- 3:00 pm-3:15 pm: Break
- 3:15 pm-4:30 pm: Wrap up loose ends and agree on next steps

Participants

CREST

1. [Tarendra Lakhankar](#) - The City College of City University of New York
2. [Indrani Pal](#) - The City College of City University of New York
3. [Jonathan Muñoz](#) - University of Puerto Rico at Mayagüez
4. [Reza Khanbilvardi](#) - The City College of City University of New York
5. [Shakila Merchant](#) - The City College of City University of New York
6. [Rafael Solis Rodriguez](#), University of Puerto Rico at Mayaguez
7. [Equisha Dian Glenn](#) (PhD student) - The City College of City University of New York
8. [David Melecio Vazquez](#) (PhD Student¹) - The City College of City University of New York
9. [Jean Pierre Valle](#) (MS student) - University of Puerto Rico at Mayagüez
10. [Aris Fernandez](#) (MS student²) - City College of City University of New York

¹ Starting NERTO with Stan Benjamin this fall

² Currently doing NERTO at ESRL with Alan Brewer

PSD

1. [Rob Cifelli](#)
2. [Rich Lataitis](#)
3. [Robin Webb](#)
4. [Roger Pulwarty](#)
5. [Kelly Mahoney](#)
6. [Bob Zamora](#)
7. [Mimi Hughes](#)
8. [Jungho Kim](#)
9. [Mike Hobbins](#)
10. [Andy Hoell](#)
11. [Gary Wick](#)
12. [Lynn Johnson](#)

GSD Kevin Kellerher

GMD James Butler

CSD David Fahey

National Water Model Background

There are a number of resources that can be used to familiarize with the NOAA National Water Model. These resources range from PowerPoint presentations to education training materials offered through the COMET program and interactive websites to explore National Water Model output. Listed below are the key resources available from NOAA's Office of Water Prediction and NCAR.

- Office of Water Prediction
 - **NOAA Water Initiative two-page document** is [here](#). This document provides some useful context for how the National Water model fits within NOAA's broader plans to enhance the provision of water information and improve water prediction.
 - **National Water Model two-page overview** is [here](#). This document briefly describes the National Water Model and key aspects and enhancements in model versions 1.0, 1.1, and 2.0.
 - **National Water Model website description** is [here](#). This website lists some of the key features of the National Water Model, including a description of the different forecast cycles, where to obtain output data, and how to display the output through different Office of Water Prediction interactive web sites (described below).
 - **National Water Model experimental imagery website** is [here](#). This site allow you to zoom in to different geographic regions and view/animate selected National Water Model products, including streamflow, soil moisture, and precipitation for the analysis and different forecast cycles (short, medium, and long range).
 - **National Water Model website experimental mapping interface** is [here](#). This interface can be used to drill down to individual stream reaches and view selected National Water Model output, including streamflow and streamflow anomalies (other products will be added in the future).
- NCAR
 - **NCAR-UCAR Cooperative Program for Operational Meteorology, Education, and Training (COMET) Training National Water Model Part 1: Science and Products** is [here](#). From the COMET module description: *"This lesson provides an introduction to the benefits, important input (forcing data), and key products of the National Water Model. Both official and evolving products are presented. The lesson uses the flooding associated with Hurricane Harvey in August 2017 to demonstrate key products."*

- **NCAR-UCAR Cooperative Program for Operational Meteorology, Education, and Training (COMET) Training National Water Model Part 2: Early Performance** is [here](#). From the COMET module description: *“In this lesson the learner will review and interpret data regarding the early performance of the National Water Model (versions 1.0 -1.2). Verification and evaluation of the National Water Model has been occurring since it went operational in August 2016. This lesson will review some of the main issues in model performance through early 2018, including some retrospective verification extending back to 2011. You will see how model performance has been improved as a result of verification. Among the topics addressed are peak flow timing errors, model bias and correlation, the impacts of basin calibration, inclusion of reservoirs, snowpack evolution, drainage in sandy soils, Quantitative Precipitation Forecasts (QPF), and time-lagged ensembles.”*
- **NCAR overview slide set of the National Water Model** is [here](#). This slide set describes some of the technical aspects of the National Water Model including the workflow, Meteorological Forcing Engine, routing, and physics. The slides also include an overview of National Water Model products, verification/evaluation tools developed by NCAR, and improvements in model performance between versions 1.0, 1.1, and 1.2.
- **NCAR WRF-HYDRO website** is [here](#). This web site describes the community WRF-HYDRO framework that is the foundation of the National Water Model. The site includes access to model code, training, test cases, and other resources.