

CSTAR: Collaborative Science Technology and Applied Research Program



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NOAA VLab: CSTAR Community

Abstract

The Collaborative Science, Technology, and Applied Research (CSTAR) program supports a critical link between university researchers and National Weather Service (NWS) personnel. The goal of the program is to create a cost-effective transition from basic and applied research to NWS operations and services through collaborative research between academic institutions and NWS offices. Twelve 2-3 year projects are currently funded, while several more are under no-cost extensions. These activities engage researchers and students in applied research of interest to the operational meteorological community. The CSTAR program supports NOAA's goal of advancing weather forecasting capabilities to improve numerical weather prediction and enhance weather services provided to the Nation.

Current Status

- 12 CSTAR Projects are currently active, including:
 - 5 projects awarded from FY17 RFP; continue until summer 2020
 - 7 projects awarded from FY16 RFP; to continue into 2019
- 5 CSTAR projects selected from FY14 RFP: under no-cost extensions to complete work
- Full list of projects: on CSTAR website and in the NOAA VLab CSTAR community

Overview

- Fully competitive, in-house, applied research grant program started in 2000
- One to three-year studies--maximum funding level \$150K per year
- Objective: To improve local NWS forecast and warning services by exploiting S&T improvements to the fullest
- Applied research and education projects involving collaboration between NWS forecasters and university experts
- Proposals must address national, regional or NCEP-related science needs/priorities:
 - Improving accuracy of forecasts and warnings for high-impact events
 - Improving IDSS (Impact-based Decision Support Services) for messaging of hazards
 - Improving water resource information for decision support and situational awareness

Benefits

- Forecast and Warning Improvements – especially for high-impact events
- Accelerated transition of research to operations through NWS WFO's/RFC's...NCEP...NOAA Testbeds and OPG
- Leveraging Resources:
 - Value of engaging world-class researchers, professors, graduate students at academic institutions far exceeds cost
 - Excellent student recruiting tool for university recipients
 - Dozens of CSTAR "alumni" have been subsequently employed by NOAA

Mechanics

- CSTAR FFO/RFP issued every summer (every 3rd year is an "off" year)
- RFP based on science priorities established by NWS with input of SSD Chiefs, NCEP, and others
- Proposals evaluated by team consisting largely of the above
- Funding normally obligated by May 1
- Next CSTAR FFO scheduled to be published summer 2018**
- Research to Operations Initiative: a separate NWS program that has funded 40 NGGPS modeling, HFIP and NOAA testbed projects that began in 2015 and 2016

Research to Operations

- With the successful completion of CSTAR grant activities, it is expected that there will be a proof of scientific concept for a capability that meets a NWS requirement
- An NWS Partner on a CSTAR project...often a SOO...will take the lead in transition activities
- This may involve a peer-reviewed publication of results, sharing data through the NOAA Virtual Lab, conducting software development and/or operational testing and evaluation through the NWS Operational Proving Ground

Examples of current CSTAR Projects

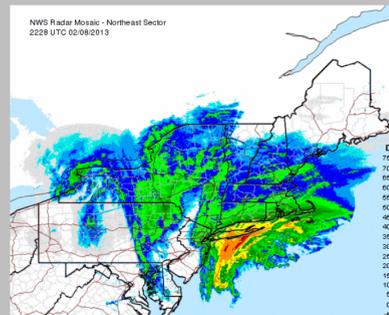
SUNY Albany

"Development of Improved Diagnostics, Numerical Models, and Situational Awareness of High-Impact Cyclones and Convective Weather Events"

- PI: Kristen Corbosiero
- Term: May 2016-2019
- NOAA Collaborating Offices: ER WFOs, OAR/ESRL

Transfer research into operations on:

- Severe convection in complex terrain
- Lake-effect snow -- model physics and predictability
- Winter storm forecasts: intensity and track predictability



Iowa State University

"Applications of HRRR Ensembles for Ensemble Hydrologic Prediction using the WRF-Hydro and SACSMA Models as Testbeds"

- PI's: Kristie Franz and William Gallus
- Term: July 2017-2019
- NOAA Collaborating Offices: NCRFC, local WFO's, ESRL-GSD

- Evaluate QPF skill based on HRRR ensembles to create streamflow information
- Compare HRRR QPF to WPC-based forecasts created by NCRFC
- Investigate spatial shifting of HRRR QPF and its impact on hydrologic forecasts



University of Utah

"Collaborative Research to Advance Analysis, Forecast, and Decision Support Services for High-Impact Weather Events"

- PI's: James Steenburgh and John Horel
- Term: July 2017-2020
- NWS Collaborating Offices: WR HQ, WFOs, MADIS program office

- Verification of CAM's and ensemble forecasts in the Western U.S.
- Develop techniques to downscale model QPF across complex terrain
- Use mesonet observations to improve data fusion techniques for forecasting convection, gravity waves, and terrain-flow interactions

