



The Collaborative Science, Technology, and Applied Research (CSTAR) Program

NOAA Testbed and Proving Ground Workshop

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Outline



- ✓ What?
 - Types of awards
 - Mechanics
 - History
- ✓ Who/Where?
 - Current Projects
- ✓ How Much?
 - Current Situation



CSTAR Program

Overview



- ✓ An umbrella program for NWS/university collaborative research consisting of:
 - *Fully competitive, in-house, applied research grant program started in 2000*
 - One to three-year studies--maximum funding level \$125K/yr
 - 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



Mechanics



- CSTAR FFO/RFP issued every summer (every 3rd year is an “off year”)
- RFP based on science priorities established with input of SSD Chiefs, NCEP, and others.
- Proposals evaluated by team consisting largely of the above
- Announcement of awards around the New Year
- Funding obligated by May 1
- COMET Outreach RFP administered by COMET
- Partner’s Projects typically “in the queue” when NWS provides funding



COMET Outreach



- COMET Outreach Program

- Smaller-scale competitive grant program managed by UCAR/COMET via OST funding and oversight
- Funded out of generally same “budget pie” as CSTAR
- Cooperative Projects: 1-3 year studies of \$30-\$40K/year
- Partners Projects: smaller scale, one-year, up to \$15K/year
- Case-study oriented
- Workshop support



CSTAR Benefits



✓ Forecast and Warning Improvement

- Accelerated transition of research to operations
- Quantitative comparisons demonstrate offices participating in collaborative research projects outperform those that do not (Waldstreicher, 2005)

✓ Leveraging Resources

- Value of engaging world-class researchers, staffs, students at academic institutions far exceeds cost
- Excellent student recruiting tool for university recipients
- Dozens of CSTAR “alumni” have been subsequently employed by NOAA



Current CSTAR Awards

University of Oklahoma



“A Partnership to Develop, Conduct, and Evaluate Real-time Convection-Resolving Probabilistic and Deterministic Forecasts for Convective-scale Hazardous Weather: Moving to the Next Level”

- PIs: Ming Xue, Xuguang Wang, Fanyou Kong, and Keith Brewster
- NWS Collaborating Offices: SPC, AWC, WPC, EMC, WFO OUN
- Provide HWT storm-scale ensemble forecasts for demonstrating and evaluating potential future high-resolution, convection-permitting and convection-resolving NWP products.
- Term: 5/1/10 – 4/30/13



Current CSTAR Awards

University of Utah



“Advancing Analysis, Forecast and Warning Capabilities for High Impact Weather Events”

- PIs: John D. Horel and W. James Steenburgh
- NWS Collaborating Offices: Multiple WFOs, WR
- MesoWest data mining, hourly surface analyses and sensitivity studies with MesoWest and related data sources, atmospheric rivers
- Term: 5/1/10 – 4/30/13



Current CSTAR Awards

Texas A&M (Galveston)



“Development of an Integrated Wave-Current-Wind Forecasting System for Cook Inlet: Supplementing NCEP’s Forecasting Efforts”

- PIs: Vijay Panchang
- NWS Collaborating Offices: WFOs Galveston/Houston, Anchorage, EMC/MMB
- 2-day ocean wave prediction system for Cook Inlet AK using WRF, WAVEWATCH III and SWAN
- Term: 5/1/10 – 4/30/13



Current CSTAR Awards

SUNY Albany



“Collaborative Research with the National Weather Service on Cool-and Warm-Season Precipitation Forecasting over the Northeastern United States ”

- PIs: Lance Bosart and Dan Keyser
- NWS Collaborating Offices: WFOs ALY, BGM, LWX
- Ice storms and freezing precipitation in the northeastern U.S., Appalachian lee troughs; mesoscale substructure in winter storms; inland reintensification of tropical cyclones (TCs) over the eastern U.S. resulting from TC-jet streak interactions.
- Term: 5/1/10 – 4/30/13



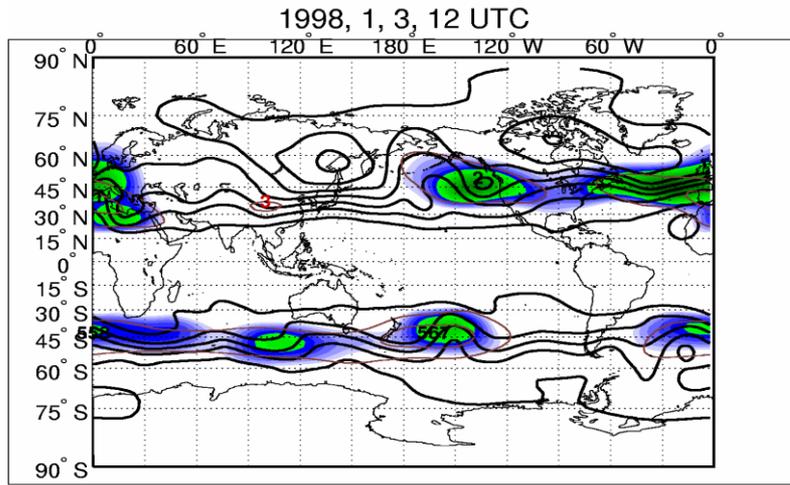
Current CSTAR Awards

SUNY Stony Brook



Predictability of High Impact Weather during the Cool Season over the Eastern U.S

NWS CSTAR Partners: David Novak and Mike Bodner (WPC); Yuejian Zhu, Yan Luo; Jun Du, and Jordan Alpert (EMC); Joseph Sienkiewicz (OPC), Jeff Tongue (WFO-OKX); Al Cope (WFO-PHI); Richard Grumm et al. (WFO-CTP)



CSTAR Ensemble Sensitivity Analysis Archive

- [03/16/2012 12Z \(Latest\)](#)
- [03/16/2012 00Z](#)
- [03/15/2012 12Z](#)
- [03/15/2012 00Z](#)
- [03/14/2012 12Z](#)
- [03/14/2012 00Z](#)
- [03/13/2012 12Z](#)
- [03/13/2012 00Z](#)
- [03/12/2012 12Z](#)
- [03/12/2012 00Z](#)
- [03/11/2012 12Z](#)
- [03/11/2012 00Z](#)
- [03/10/2012 12Z](#)

Ensemble Sensitivity Analysis as of 03/16/2012 12z

Overview Ensemble Spread and Mean for MSLP

For Entire North America Region

NCEP	CMC	NCEP+CMC
Days 0 - 2	Days 0 - 2	Days 0 - 2
Days 2.5 - 5	Days 2.5 - 5	Days 2.5 - 5
Days 5.5 - 8	Days 5.5 - 8	Days 5.5 - 8

For the Central and Eastern U.S. Region

Region 1 Coordinates (longitude:95W to 65W and latitude:30N to 50N)



NCEP	CMC	NCEP+CMC
Day 1	Day 1	Day 1
Day 2	Day 2	Day 2
Day 3	Day 3	Day 3
Day 4	Day 4	Day 4
Day 5	Day 5	Day 5
Day 6	Day 6	Day 6

Term: 5/1/10 – 4/30/13

- ✓ * Complete a Rossby Wave Packet Climatology and Ensemble Validation Using Automated Tracking.
- ✓ * Test new operational ensemble tools (ALPS, wave packets...) and post-processing (BMA)

- ✓ * Explore the predictability of mesoscale snowbands using multi-model ensembles.
- ✓ * Develop a real-time ensemble sensitivity tool to point forecasters toward important upstream synoptic features.



Current CSTAR Awards

NC State



“Improving Prediction of Severe Winds, Convection, and Heavy Precipitation in the Southeastern United States”

- PIs: Gary Lackmann, Matt Parker, Anantha Aiyyer
- NWS Collaborating Offices: WFOs throughout SE, EMC, SPC, TPC, WPC
- Inland wind accompanying tropical cyclones, heavy precipitation and localized flooding associated with TCs, severe convective storms under conditions of marginal instability and strong vertical shear
- Term: 5/1/10 – 4/30/13





Current CSTAR Awards

Texas Tech University



“Integration of Forecast Sensitivity into the NWS Forecasting Process to Improve Predictability of High-impact Weather ”

- PIs: Brian Ancell and Chris Weiss
- Collaborating Offices: WFOs ABQ, AMA, Corpus, SAT, FWD, LBB and OUN; SR, SPC
- Tuning and testing of the WRF ensemble Kalman filter (EnKF) assimilation/forecasting, forecaster evaluation of ensemble products and the development of forecast sensitivity products for convection, winter storms, and flooding
- Term: 5/1/11 – 4/30/14



Current CSTAR Awards

Portland State University



“Towards Objective Multi-Modeling for Multi-Institutional Seasonal Water Supply Forecasting ”

- PIs: Hamid Moradkhani
- Collaborating Offices: NWRFC, CBRFC
- Optimally combine the multi-model ensemble hydrologic forecasts using the Community Hydrologic Prediction System (CHPS) as a framework to incorporate the suite of water supply forecasting models developed over the last three decades.
- Term: 5/1/11 – 4/30/14



COMET OUTREACH

Current Awards



- Approximately 10 ongoing Partners Projects between WFO's and various universities (available on the COMET Outreach website)
- Per the COMET website, No FY13 funding is currently available for Partners or Cooperative Projects.
- No OST-overseen RFP for Cooperative projects in recent years due to lack of funds from OST
- However several Cooperative Projects and Partners Projects supported by GOES-R Program Office are currently underway



Current Situation CSTAR



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- ✓ RFP for CSTAR issued during the summer of 2012
 - ✓ Applications were reviewed and ranked in December 2012 by peer review panel
 - ✓ 18 Applicants, 11 were recommended for funding
 - ✓ Waiting for budget situation to resolve
 - ✓ New projects will be funded in rank order as budget allows
 - ✓ Two existing projects (Portland and Texas Tech) have 1 more year and are in line to receive funding before the new projects.
 - ✓ Normally these would be funded by May 1, delay expected



THANK YOU



Questions/Comments?

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