NOAA-OAR-WPO-2021-2006592 Observations Competition Project Summary Update

Project Title: Improving Analysis and Communication of Extreme Temperatures Across the New York City Metropolis Using a Dense Network of In Situ Observations
Award Number(s): NA21OAR4590360
PI Name & Affiliation: Dr. Nick Bassill, University at Albany
Co-PI Name & Affiliation: Drs. Jeannette Sutton, Eric Stern, & Chris Thorncroft, University at Albany
Award Period of Performance (08/01/2021 – 07/31/2023)
Reporting Period (08/01/2021 – 01/31/2022)
Date Submitted: March 2nd, 2022

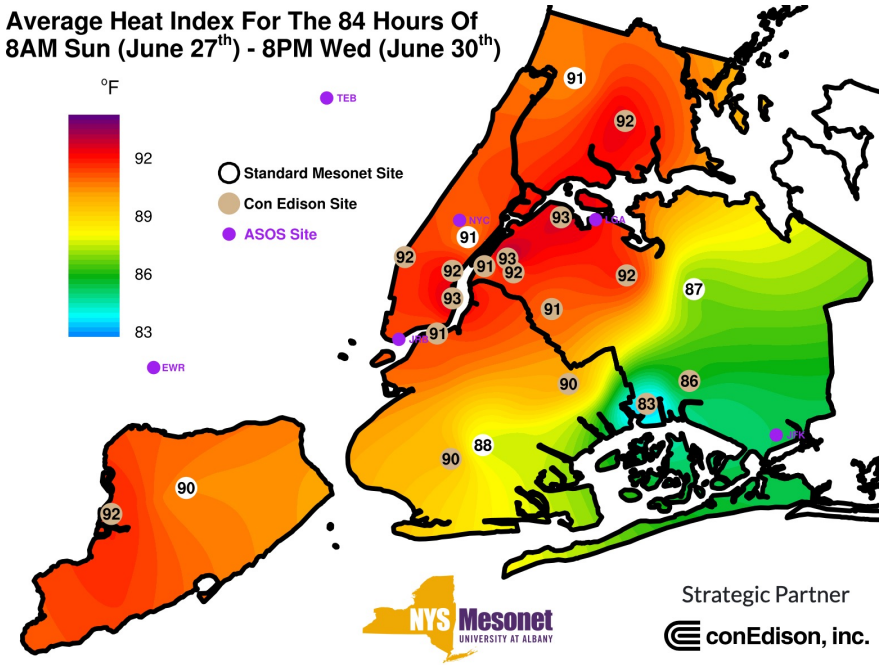
Planned Outputs/Products & Outcomes/Benefits:

Outputs/Products: We propose to create a real-time high-resolution analysis and forecast product for New York City built using several observational networks of opportunity and available NWS forecasting products for all stakeholders to use.

Outcomes/Benefits: Primary outcomes include answering key scientific questions regarding the benefits of additional observational data and better understanding predictability of extreme temperature events. Another key benefit will be improved access to easy-to-interpret and more granular weather information for use both by NWS and by key stakeholders such as NYC OEM to make more informed decisions.

Accomplishments (1/4)

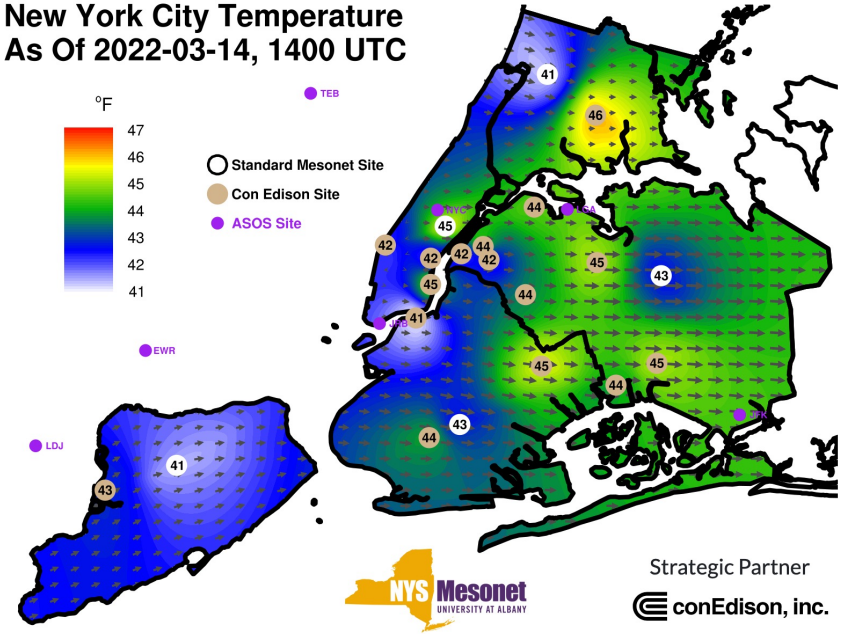
- Data streams from the NYS Mesonet and ConEd micronet have been secured, which allows us to create first looks at real-time events across NYC
- Forecast data has been procured and is being stored locally. Initial real-time comparisons to NYS Mesonet observations are being conducted.
- A very preliminary website has been created to host the above real-time products for initial feedback as we begin more intensive research

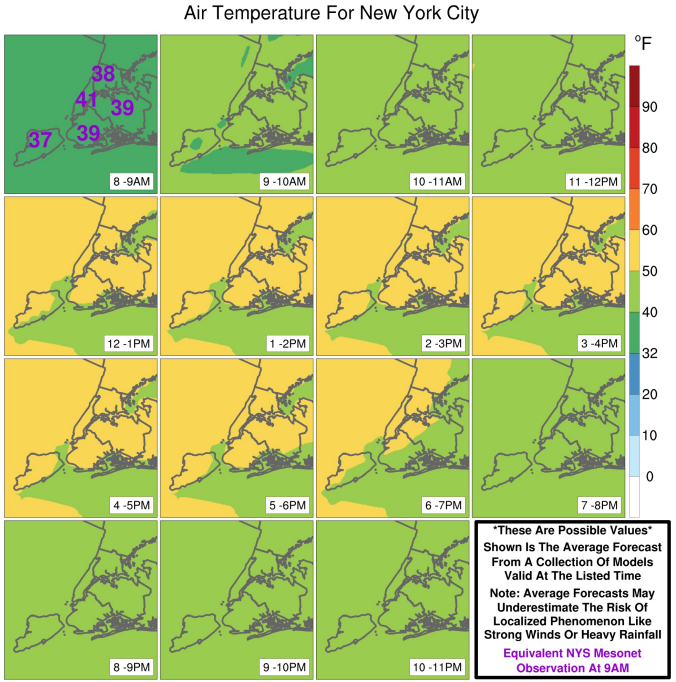


Average heat index during a 2021 heat wave

Accomplishments (2/4)

Networks+ NYC Maps NYC Forecasts



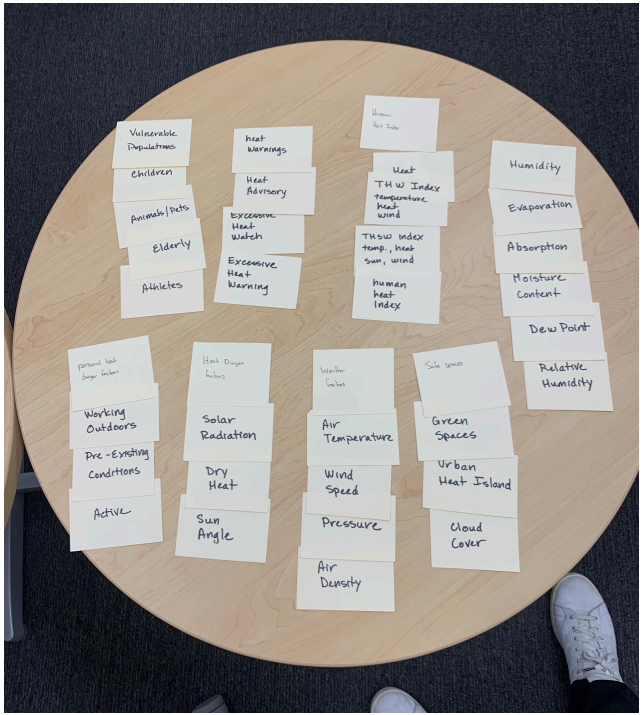


This work is supported by NOAA OAR award NA21OAR4590360

Accomplishments (3/4)

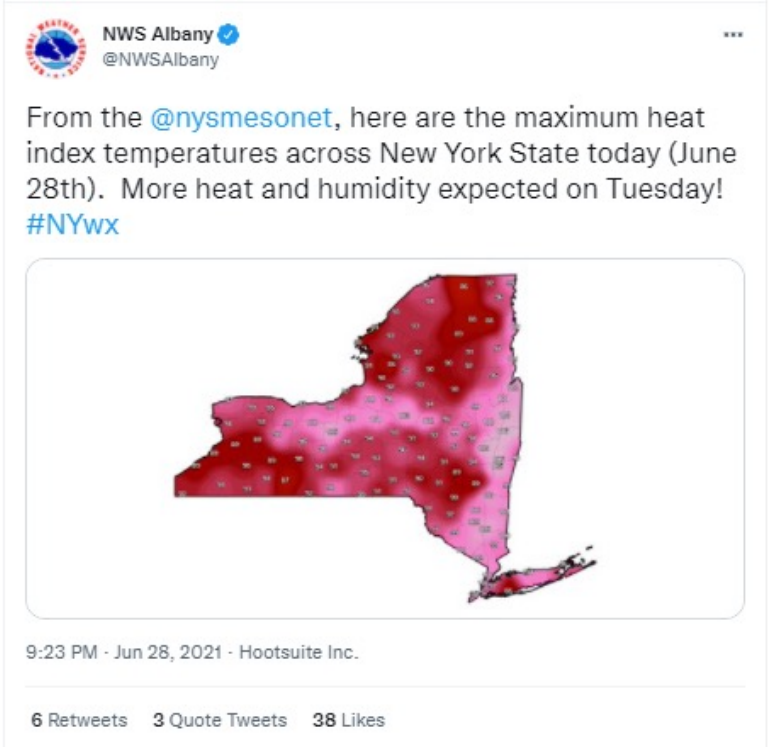
- Reviewed the website contents for every WFO that issued an excessive heat product in 2021 (N=50)
  - 45 connected only to WRN and/or the NWS Experimental HeatRisk index
  - 5 WFOs had pages developed to reflect local history, current risk, and other contents

- Conducted card sorting interviews with 6 experts and 21 graduate students in atmospheric science, emergency management, and public health
  - Results will inform the organization of content on a public-facing website communicating about extreme heat



Accomplishments (4/4)

- Collected and analyzed Tweets from 7 WFOs about extreme heat events in 2021
  - A few things stand out such as the use of metrics (heat index) and weather product names (heat advisory) that are not explained in the messages; the lack of guidance info; and the use of visual cues to identify populations at risk
- Paper draft in progress using these data
- The key findings will be used to inform the public facing webpage and communication about extreme heat



Milestones Table (1 of 2)

No.	Milestone Description	Date (Planned Completion)	Date (Actual Completion)	Status (% Complete)
1	Literature Review	October 2021	November 2021	95% (pending new literature)
2	IRB Approval	October 2021	August 2021	100%
3	Retrospective Case Analysis	December 2021	Incomplete	50%
4	Develop Observational Data Streams	December 2021	Mostly Complete, pending CUNY	80%
5	Gather Forecast Data	January 2022	October 2021	100%
6	Usability Study/Needs Assessment	February 2022	February 2022	95%(pending new information)
7	Calculate Forecast Errors & Biases	March 2022	Incomplete	20%

Milestones Table (2 of 2)

No.	Milestone Description	Date (Planned Completion)	Date (Actual Completion)	Status (% Complete)
8	Develop Real-Time Analyses	October 2022	Incomplete	25%

Note that the milestones listed here are either milestones we identified in the proposal as having been completed by 6 months, OR milestones for which significant work has been conducted.

Readiness Levels (RL)

Status	Date (MM/YY)	RL (1-9)	Explanation of Determination & Details https://wpo.noaa.gov/R2O/Transitions/RLevels
At start of Project	09/21	5	This assessment was primarily estimated based on the existing availability of these networks and most forecast products, but the nonexistent research done on these data sources.
Reporting Period 1	02/22	5	At the conclusion of this reporting period, a very basic prototype was in creation.
Reporting Period 2			
Reporting Period 3			
Planned at end of project	09/23	8	Note that the time listed here is the original end time. Given delays in procuring a post-doc, we may seek a no-cost extension.

Transition Plan Status

Status	Planned Completion Date (MM/YY)	Actual Completion Date (MM/YY)	Notes
Attend Transition Plan Training	01/22	01/22	
Initial PI POC meeting	03/22		Jeff Waldstreicher and PI will meet first, then collectively with Dave Radell (OKX SOO) once Dave returns from a training exercise in mid-March.
Opened the Template	01/22	01/22	
25% Draft			
50% Draft			
75% Draft			
100% Draft submitted to WPO for review			

NOAA Testbeds

Will this project use NOAA Testbed resources?	No
If applicable, provide a summary of the status of collaboration with NOAA Testbeds	N/A

Publications

New this Reporting Period? Yes/No	Date of Acceptance or Publication (MM/YY)	Full Reference and digital object identifier (DOI) if available https://apastyle.apa.org/learn/faqs/what-is-doi

Presentations

New this Reporting Period? Yes/No	Date of Presentation (MM/YY)	Title and Forum of Presentation
Yes	01/22	*Communicating Wetbulb Globe Temperature: Results from a Usability Study*. Presented at the 102nd Annual Meeting of the American Meteorological Society, 10th Symposium on Building a Weather-Ready Nation – Given By Jeannette Sutton

Project web sites or data viewers

Description	Link
Preliminary location to post relevant real-time maps and forecast products. Although these are not a finished version of the proposed work, it is useful for ongoing evaluation by us as well as NWS and other partners.	https://operations.nysmesonet.org/~nbassill/NOAA/

Finances

Reporting Period	Actual Reporting Date (MM/YY)	$ Planned to be Spent	$ Actual Spent	Comments
6 month	**02/22**	**75,000**	**49,930.75**	Planned money is a rough estimate assuming a post-doc would have been hired earlier than currently expected
1 year				
18 month				
24 month				

Issues & Risks

	Description	Mitigation
Issue 1	COVID-19 Pandemic	Rather than in-person events with NWS and NYC OEM contacts, we have done virtual events
Issue 2	Post-doc posting produced few obvious choices	Currently working through paperwork to hire a qualified candidate from India
Risk 1	Web development skills may be lacking or un-developable by project personnel	May attempt to employ local web-dev expertise and/or hire other outside student assistance
Risk 2	May not be able to access CUNY weather station data due to COVID/repair issues	Without this data we still have a robust network of 3 sub-networks across NYC.

Future Work

Key next steps:

- Hire post-doc
- Begin calculating wet bulb globe temperature in real-time (and any other heat products)
- Begin more seriously evaluating model performance during extreme heat events (past/present) across NYC
- Conduct “real-time” evaluation of best practices before and during a heat event at NWS OKX and NYC Office of Emergency Management
- Continue meeting semi-regularly with project partners and NWS POC
- *Social science – complete card sorting interviews/analyze data; develop public facing heat communication stimuli for testing*