Integrating Social and Physical Sciences at the National Weather Service to Understand the Ready in Weather-Ready Nation

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Social, Behavioral, and Economic Sciences (SBES) Program
Office of Science & Technology Integration (OSTI)
National Weather Service (NWS)

July 26, 2023
Overview

- Introduction to Social Science
- Program Direction & Goals
- Current & Future Projects
- Next Steps for Integration
What is Social Science?
Social Science Defined

What is social science?

- Human Geography
- Linguistics
- Political Science
- Anthropology
- Communication
- Translation Studies
- Sociology
- Economics
- Psychology
- Criminology
- Law
- Development Studies
- Cultural Studies
- Education
Employs quantitative and qualitative methods

Helps us make **better decisions** to improve our quality of life

Studies people, societies, and the relationships among them

Includes multiple disciplines (e.g. anthropology, economics, human geography, linguistics, communication sciences, political science)

**Social Science Value**
Social Science Methods
Vision Statement:
Turning weather, water, and climate information into social action

Mission Statement:
Making the National Weather Service better through social science
NWS OSTI SBES Program Goals

Goals:

1. **Advance the Science**: Conduct innovative research on the links among humans, weather, water, and climate.

2. **Build SBES Capacity**: Grow the utility of SBES to the NWS.

3. **Collaborate Internally**: Improve processes and promote better application of SBES.

4. **Engage Externally**: Leverage expertise and establish best practices to advance service equity.

Core Values: R\(^6\)
- Rigor
- Relevance
- Respect
- Relationships
- Revolutionary
- Responsive
Research Priorities

Ensuring Equitable Services to all Communities

Understand Place

Communicate Risk

Evaluate Products

Assess Impact

Examining the convergence of society, space, and weather

Refining tools and messages to communicate risk and uncertainty

Improving products and services for all partners, including the public

Developing measures and studying the outcomes of weather
Questions
How to integrate social science into the weather enterprise?
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<thead>
<tr>
<th>Current Projects</th>
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<tr>
<td>Understanding the Human Response to Water Hazard Products (BIL Prov.3)</td>
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<td>Understanding the Human Response to Fire Weather Products (BIL Prov.5)</td>
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<td>Supporting the Improvement of Tsunami Warning Messages</td>
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<td>Opportunities for WCMs to Support Service Equity and Use of Weather and Hydrologic Data Products</td>
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<td>Collaborative Science, Technology, and Applied Research (CSTAR) Program 2022 Projects</td>
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<td>Supporting the Improvement of Winter Weather Products</td>
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<td>Space Weather Advisory Group User Needs Support</td>
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<td>Current Projects</td>
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<tr>
<td>Supporting the Improvement of Severe Weather Products</td>
<td>![Location Symbol]</td>
<td>![Communication Symbol]</td>
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<td>Statistically Exploring the Relationship between Social Vulnerability and Tornado Warning Reception, Comprehension, and Response</td>
<td>![Analysis Symbol]</td>
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<td>Using Colormaps to Communicate Risk</td>
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<td>Supporting the Evolution of the Weather Dashboard</td>
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<td>Analysis for Probabilistic and Risk Reduction Decision Support for Fire Weather Services</td>
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<td>Literature Review of Prior NWS Funded Research Projects</td>
<td>![Analysis Symbol]</td>
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<td>Testing the Waters: Using Social Science Methods to Incorporate Stakeholder Needs to Co-Develop WPC precipitation Products and Services</td>
<td>![Communication Symbol]</td>
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<td><strong>Societal Data Insights Initiative</strong></td>
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Space Weather Advisory Group User Needs Survey
Understanding the Human Response to Water Hazard

Products

Prepare for **Coastal Flooding**

- Elevate your belongings off the ground
- Move your car to higher ground
- Have an evacuation plan

[Images of flooded areas and vehicles]

 NOAA

weather.gov

UIFCW 2023
A UFS Collaboration Powered by EPIC
Societal Data Insights Initiative

The Infrastructure Vision

Version 1.0

Internal Data Lake

Public Archive

NOAA Users
- Portfolio Analysis
- Product & Service Evaluation
- Economic Valuation

Public Users
- Access WxSurvey Data
- Access Social Science Data
- Access Social Science Instruments

NOAA Weather Data
External Behavioral Indicator Data
WxSurvey Dashboard Data
Internal & External Social Science Data

Publicly Accessible Data

Website for Social Science Insights

UIFCW 2023
A UFS Collaboration Powered by EPIC
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<th>Potential Future Projects</th>
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<td>Conduct Social Network Analysis of Selected Communities and Hazards</td>
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<td>Conduct Case Studies of Specific Weather Hazards and Communities</td>
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<td>Conduct an assessment of existing NWS databases including the Storm Events, Damage Assessment Tool, NOESS, etc.</td>
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<td>Depict Risk and Severity Across Weather Hazards Consistently</td>
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<td>Develop Culturally Diverse Products and Services in Multiple Languages</td>
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<td>Improve Forecast Literacy Among the Public</td>
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<td>Quantify and Understand the impacts of weather and NWS investments on communities</td>
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<td>Understand the impacts of NWS Products and Services to Mitigate the Impacts of Weather</td>
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<td>Support Local WFOs and CSCs in Conducting SBES Research</td>
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<td>Develop a systematic processes for gathering SBES requirements, designing research, and transitioning research into operations</td>
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<td>Craft Achievable Metrics to Fulfill the NWS Mission</td>
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<td>Review the Product Development Process to Better Integrate SBES</td>
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<td>Design an Evaluation Framework to Align Assessments and Case Studies to Identify Best Practices and Challenges</td>
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<td>Integrate/Develop a SBES Testbed for the NWS</td>
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Assessment of Existing NWS databases including the Storm Events, Damage Assessment Tool, NOESS, etc.
SBES Testbed for the NWS (or integrate into others)
Thank You!

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Questions