



Penn State University
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NOAA's National Weather Service
Improving Services to Protect America

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NWS Mission

Provide weather, water, climate services that:

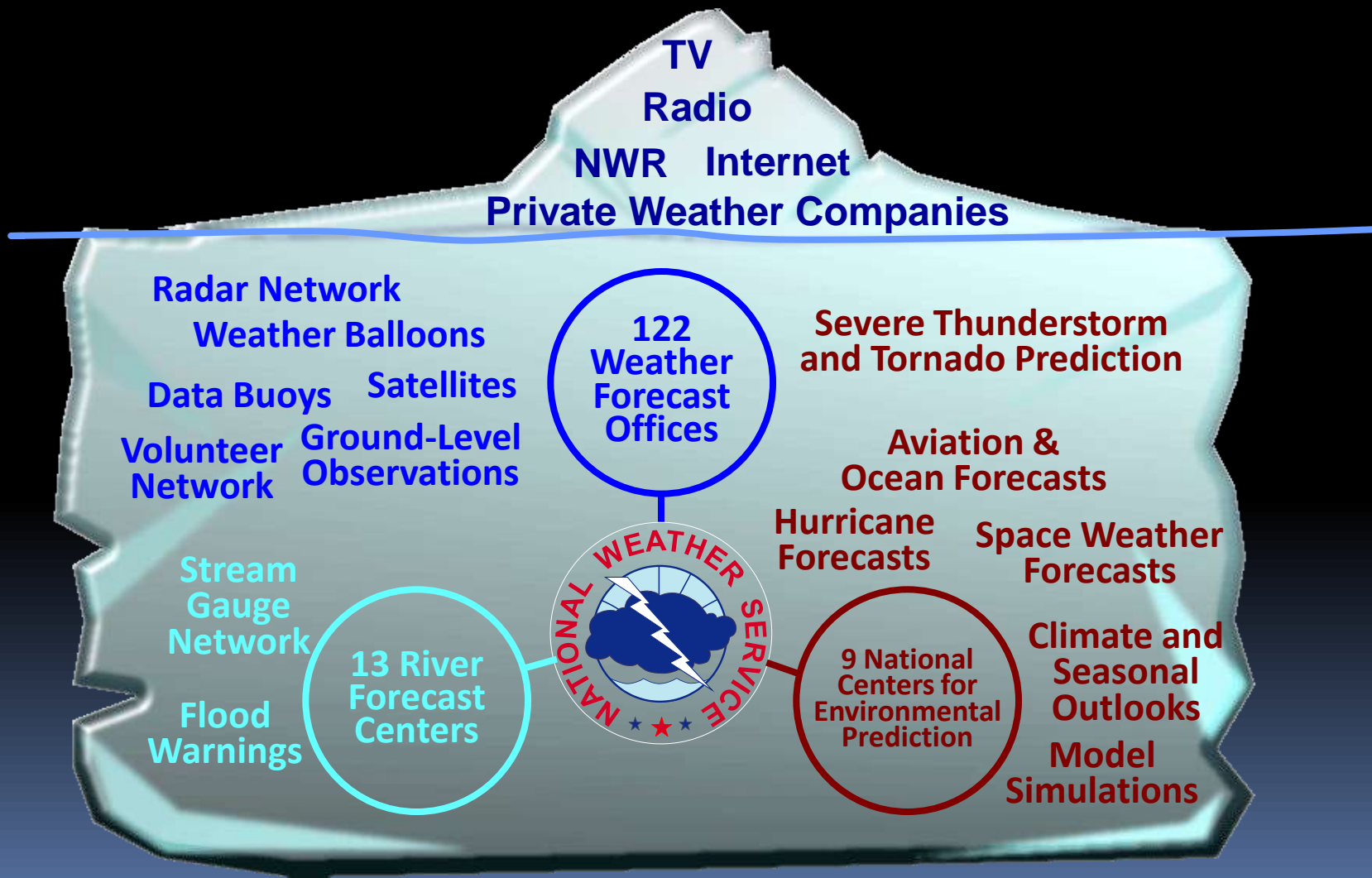
- *Protect Life & Property*
- *Enhance the National Economy*

Outreach Goals

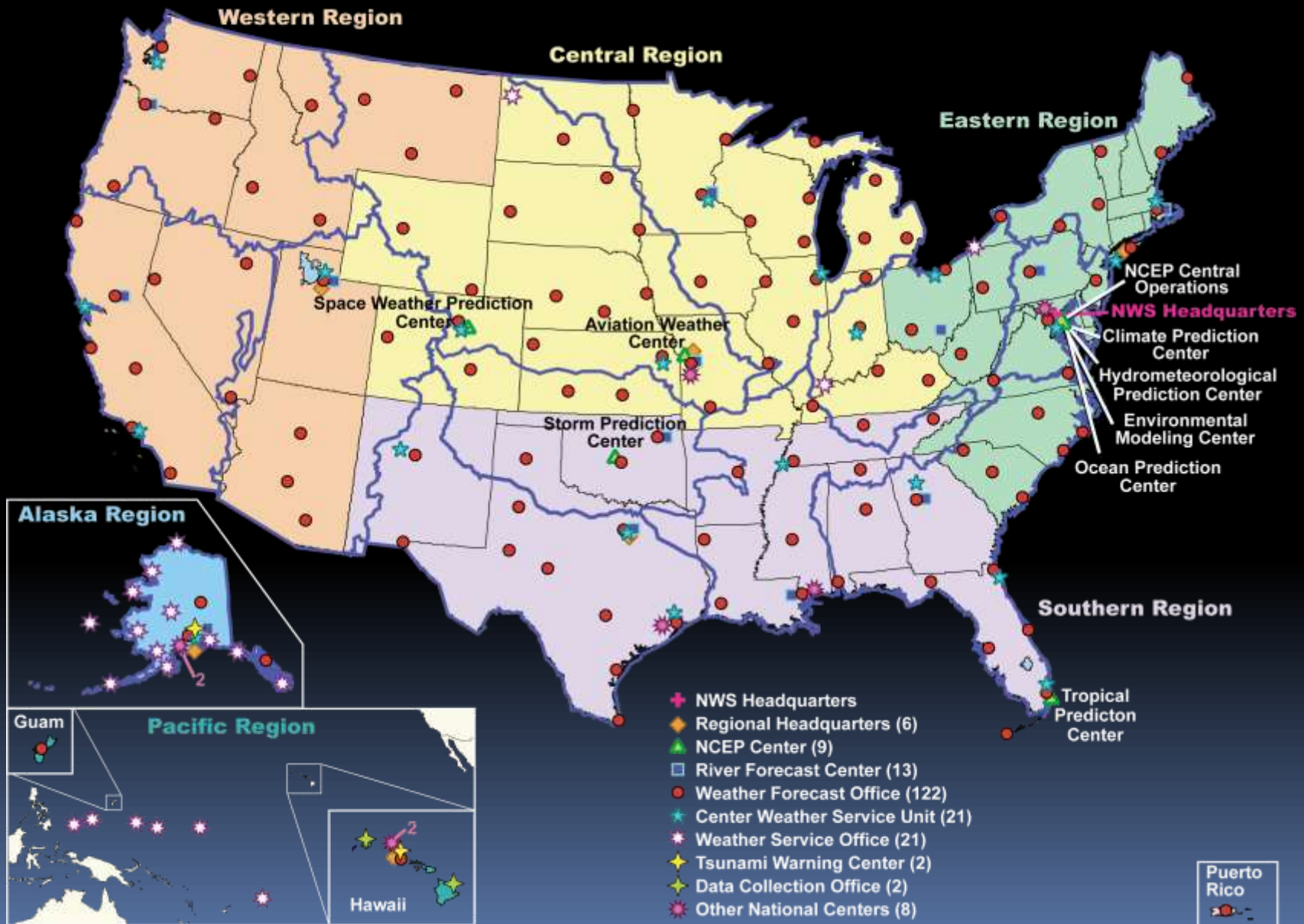
- *Inform partners of Science and Technology goals and challenges*
- *Build partnerships*
- *Attract best and brightest to NOAA*

NWS Overview

The average person only sees the tip of the iceberg



Where We Are



Impacts on Society

A Typical Year in the U.S. Sees...



**6 Atlantic
Hurricanes**



1,270 Tornadoes



5,000 Floods



**27,000 Severe
Thunderstorms
(wind + hail reports)**



**Drought and
Large Wildfires**

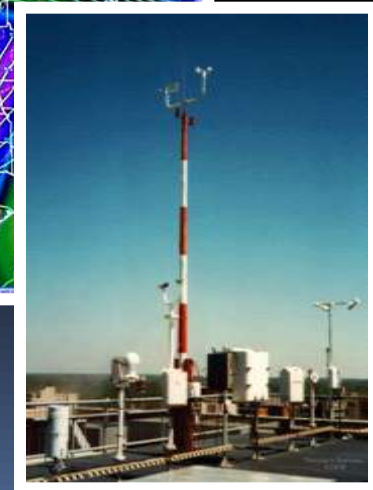
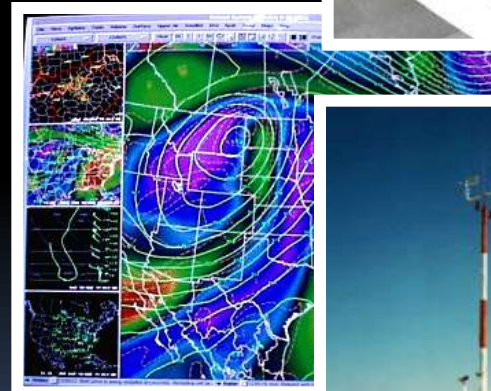
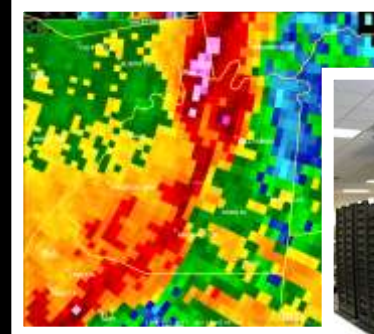
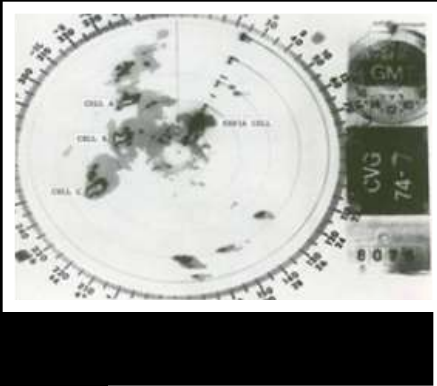


**600 Deaths
5,000 Injuries
\$14B in Losses**

NWS Overview

Then...

Now...





High Marks for What We Do

Survey Finds Weather Forecasts are Great Value for Americans

- 90% of Americans check weather forecasts more than three times daily
 - *Satisfaction is high*
 - *Confidence in forecasts is fairly high*
- Total annual value = \$31.5 billion
- Total costs = \$5.1 billion

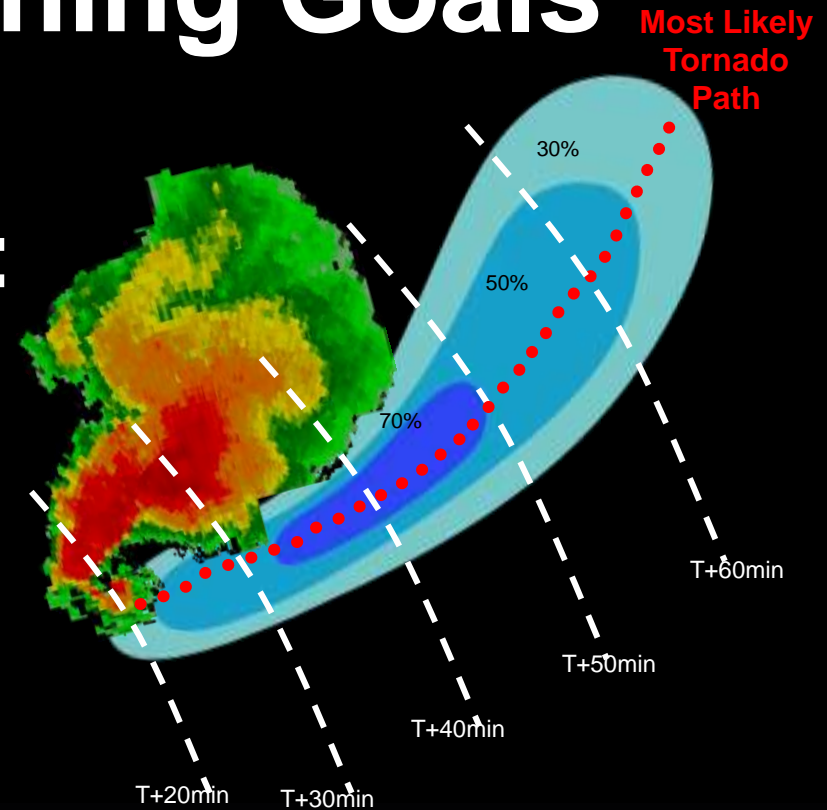
Our Future Direction

...to infuse **the best science and technology** into forecast operations in order to communicate the most accurate information that enables decision makers



Tornado Warning Goals

Warn-On Forecasts: One-Hour Tornado Lead Times



requires

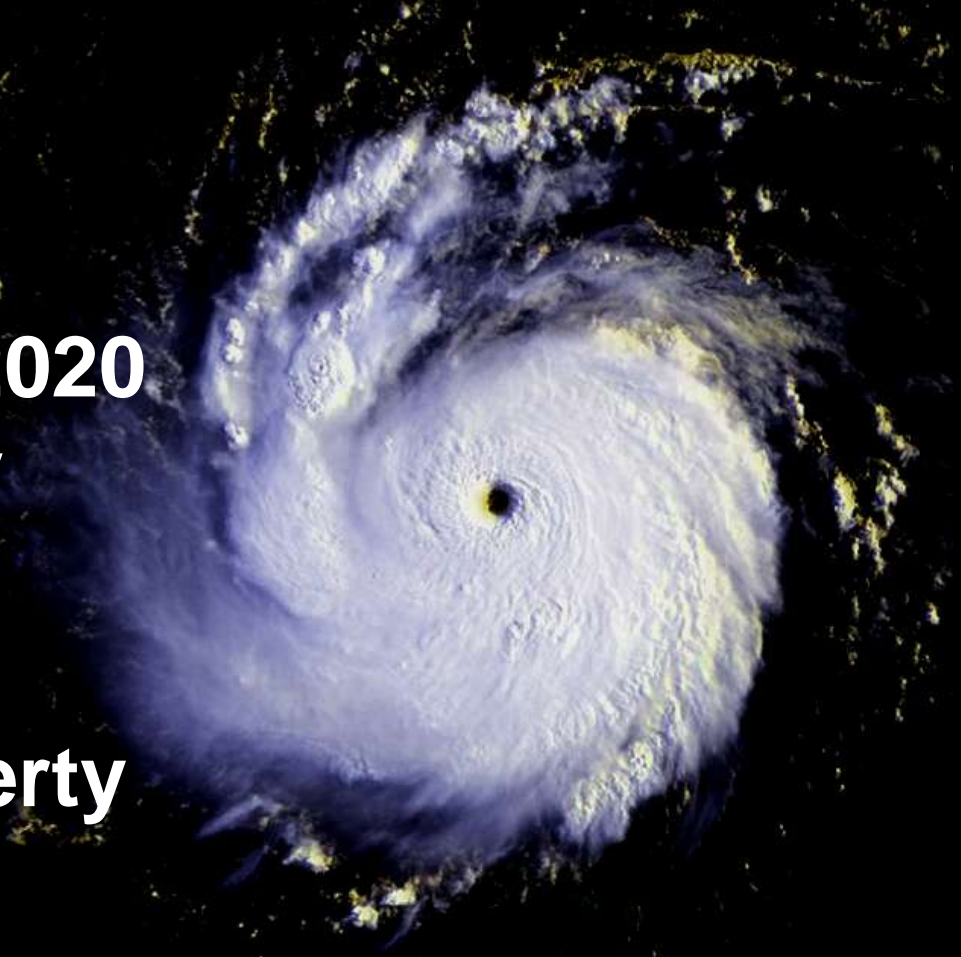
- » Better initiation of convection forecasts
- » Higher-resolution models
- » More timely data
- » Better assimilation systems

Hurricane Forecasts

**50% Reduction in
Forecast Track and
Intensity Errors by 2020
enabling emergency
managers
and local officials to
save lives and property**

requires

- »Better sea surface observations
- »Better ocean-atmosphere coupled models



Climate Services

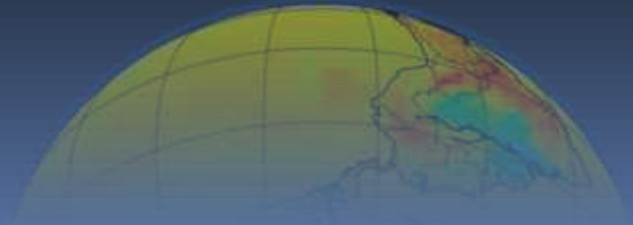
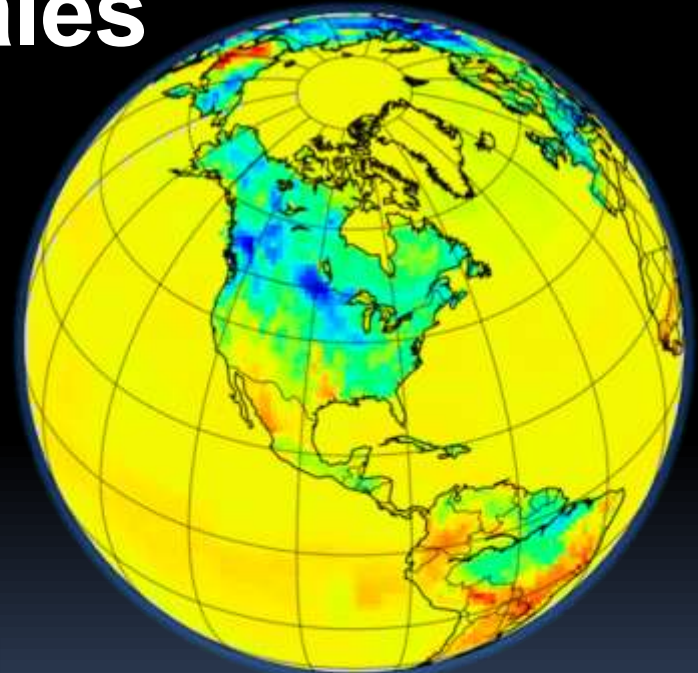
Improved Climate Forecasts on a Variety of Timescales

benefits

- »Energy
- »Agriculture
- »Water management
- »Health

requires

- »Multi-model ensembles
- »Reanalysis
- »Climate Testbed infrastructure



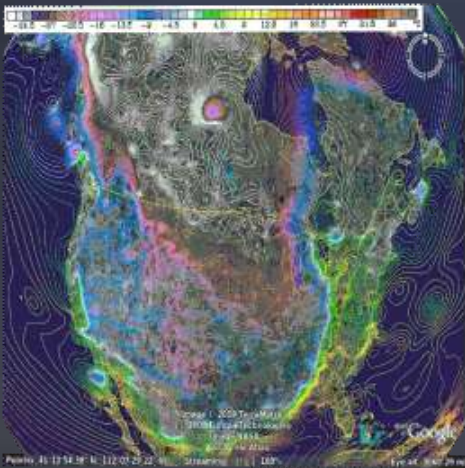
Fire Weather Services

Improve detection and fire movement forecasts by focusing research priorities on the needs of land management partners and Emergency Managers

requires

- » Better assimilation of local observations
- » Increase R&D of coupled fire weather modeling
- » Development of Fire Weather Testbed

Aviation Weather Services



Better integration of weather data into air traffic management decision making to maximize efficiency of air traffic system

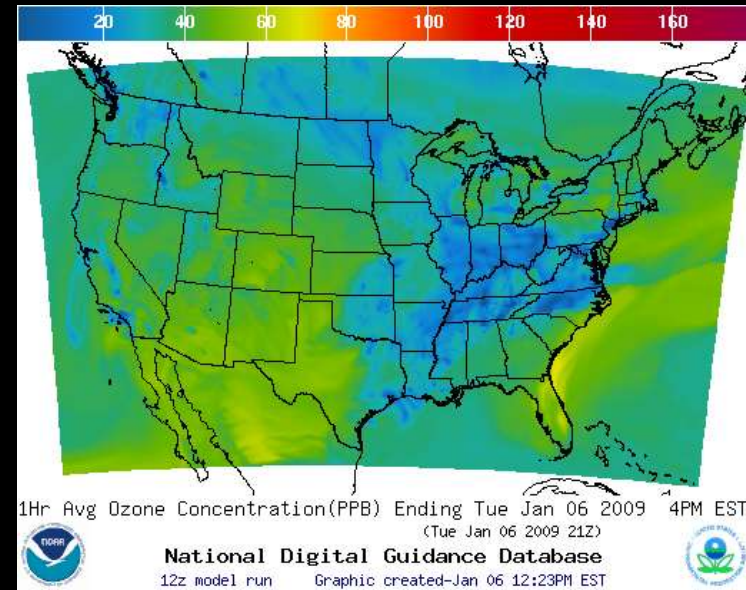
requires

- » Partnering with FAA
- » Moving beyond “cope and avoid” to “exploit and mitigate”
- » Development and implementation of 4D Weather Data Cube
- » Better initiation of convection forecasts

Air Quality Predictions

Expand hour-by-hour predictions of air pollutant concentrations from CONUS to nationwide, in state of the art formats

requires



- »Improved capabilities for predicting emission, secondary aerosol formation, reactive transport, and deposition of particulate matter
- »Leveraging EPA's air quality monitoring networks
- »Partnering with local, state, and Federal agencies

Integrated Water Services

Develop a seamless suite of information from the “Summit to the Sea” to address growing demands for water forecasts

requires

- »Forecasts for the entire watershed
- »Higher resolution water quantity, quality, and soil moisture forecasts
- »Improved resource protection capabilities for rivers, estuaries, and coasts



Coastal Inundation and River and Flash Flooding

Create new forecast tools and capabilities to provide finer-scale warnings to decision makers

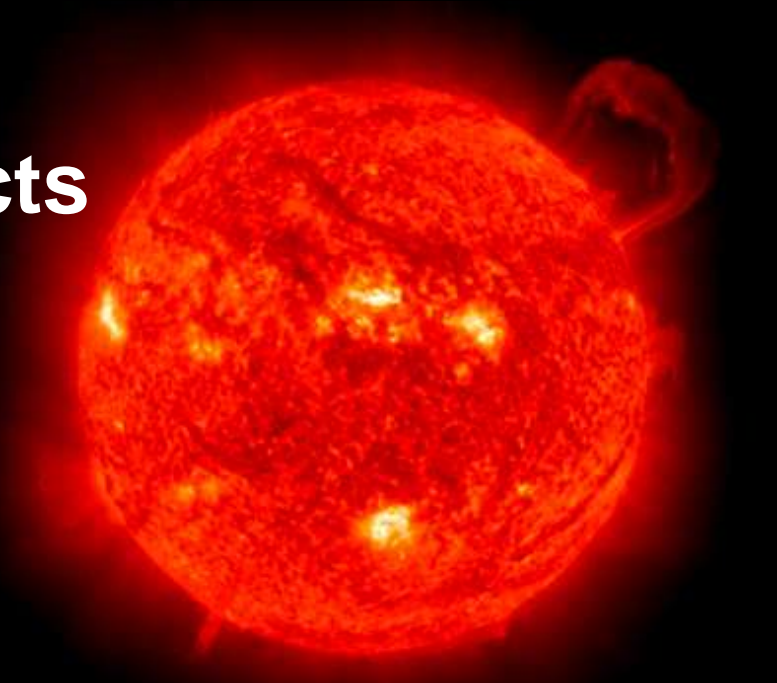
requires



- »Partnering with local, state, and Federal partners
- »Transfer of key findings from Hydrometeorological Testbed into NWS operations

Space Weather Services

New products and services to mitigate effects to national security, communication, and economic systems



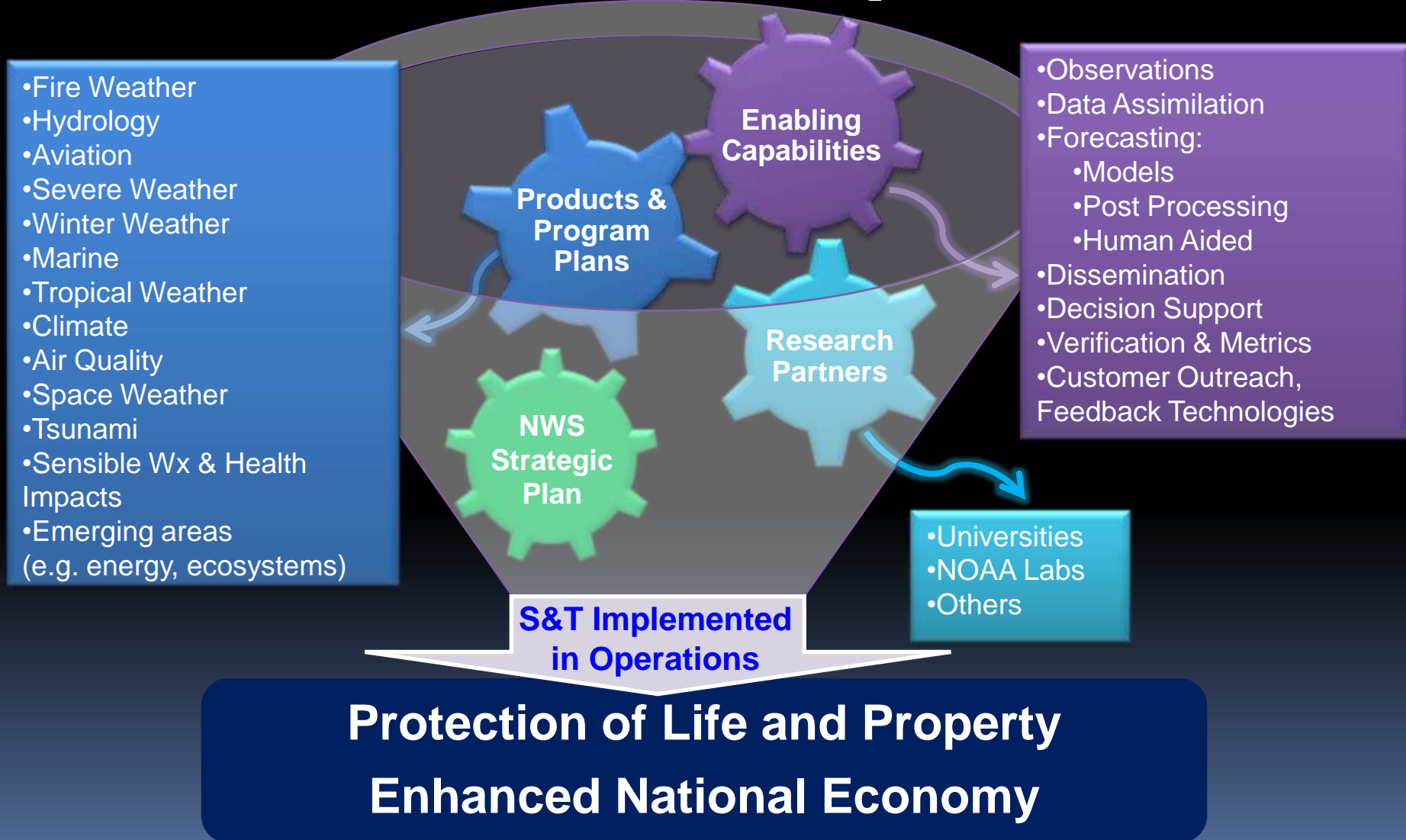
requires

- » Improved observations, research, and modeling
- » Integration of space weather into resource protection decision making
- » Partnerships and international collaboration



**We're building a
Science and
Technology
Road Map
that will look 15-20
years into the future**

Science and Technology Road Map



Looking Beyond Tomorrow



Big Questions Remain:

- How do we find the right mix of forecaster and automation when dealing with increased volumes of data?
- How do forecasters deal with and communicate probabilistic information in a way that is useful to decision makers?
- What can we afford and how do we prioritize?

Building a Road to the Future

Partnerships are
an essential part of
reaching our goals



Working for NOAA/NWS



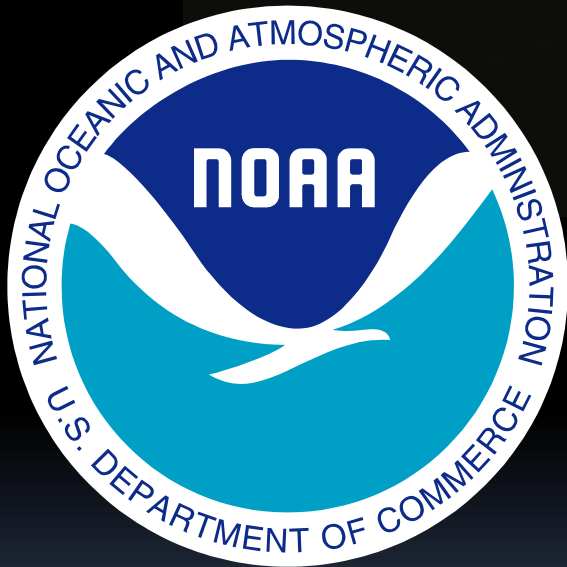
NWS Past



NWS Present



The Best Places to Work
IN THE FEDERAL GOVERNMENT 2009



Score: 69.8

#35 out of 216

How Much Can You Earn?

2009 National GS Pay Scale

Grade	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 7	Step 8	Step 9	Step 10
1	17540	18126	18709	19290	19873	20216	20792	21373	21396	21944
2	19721	20190	20842	21396	21635	22271	22907	23543	24179	24815
3	21517	22234	22951	23668	24385	25102	25819	26536	27253	27970
4	24156	24961	25766	26571	27376	28181	28986	29791	30596	31401
5	27026	27927	28828	29729	30630	31531	32432	33333	34234	35135
6	30125	31129	32133	33137	34141	35145	36149	37153	38157	39161
7	33477	34593	35709	36825	37941	39057	40173	41289	42405	43521
8	37075	38311	39547	40783	42019	43255	44491	45727	46963	48199
9	40949	42314	43679	45044	46409	47774	49139	50504	51869	53234
10	45095	46598	48101	49604	51107	52610	54113	55616	57119	58622
11	49544	51195	52846	54497	56148	57799	59450	61101	62752	64403
12	59383	61362	63341	65320	67299	69278	71257	73236	75215	77194
15	98156	101428	104700	107972	111244	114516	117788	121060	124332	127604

You Can Join Us!

Student Career Experience Program (SCEP)

<http://www.weather.gov/mdl/coop/coop.php>

Hollings Scholarship

http://www.oesd.noaa.gov/Hollings_info.html

NOAA SeaGrant Fellowship

<http://www.seagrants.noaa.gov>

NOAA Educational Partnership Program (EPP)

<http://www.epp.noaa.gov>

Presidential Management Fellows (PMF) Program

<https://www.pmf.opm.gov>