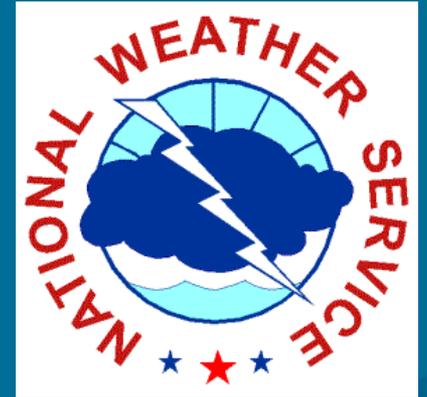


Climate Outreach Efforts in Southeast Alaska



Rick Fritsch

Lead Forecaster, Climate Focal Point

NWS Forecast Office, Juneau

National Climate Services Meeting

Silver Spring MD, 9-12 May 2016

Limited But Meaningful

- *Tourism – Mendenhall Glacier*
- *Teachers*
- *Schools*
- *Summer Camps*
- *Dam Operators*
- *Local studies*
 - *Poster session*

Tourist Attractions

- ***Mendenhall Glacier Visitor Center***
 - *400,000+ visitors per season*
 - *Some really crazy questions*
 - *Climate change doubters*
 - *Climate change fanatics too*
- ***Summer hire docents***
 - *Full spectrum of scientific literacy*
 - *Some of them are doubters and fanatics too !*
 - *They are the public interface*
- ***Global Climate Change Presentation***

Global Climate Change Presentation

- ***Borrowed heavily from Mike Staudenmaier***
 - *Tailored to be Panhandle specific*
- ***Objective (as much as one can be)***
- ***It's not "global warming"!***
 - *Climate change as well as climate variability covered*
 - *ENSO and PDO impacts included*
- ***"Was yesterday's heavy rain a result of climate change?"***
 - *Climate is the statistics of weather.*
 - *Climate is what you expect, weather is what you get.*

Global Climate Change Presentation

- *How to handle doubters*
- *How to handle fanatics*
- *Data (refreshed periodically)*
- *Avoid politics of the visitor*
 - *Once politicized, science becomes a “movement”*
- ***Advice to docents as well as to visitors:***
 - *Don't take my word for it. Go read the peer reviewed source material (and avoid the media).*
- ***Wrapping up:***
 - *Spaceship analogy*
 - *Bibliography of references*

Teachers and schools

- ***Statewide Teacher Workshop***
 - *Oceans & the Climate – Making the Connection*
 - *Climate variability: Covers the PDO as well as ENSO*
- ***Elementary***
 - *Climate of southeast Alaska*
 - *Water cycle & erosion*
- ***High School***
 - *Meteorology 101*
- ***University of Alaska (southeast)***
- ***Input to local school district***
 - *Revised science curriculum – weather and climate*

Outreach

- ***Measure of success?***
 - *We keep getting invited back*
- ***In your own back yard***
 - *And in your face....*
- ***Extreme Ice Survey***
 - *Plays at the visitor center*
 - *2007 to 2015*
 - *Multi-year time lapse video*

***Providing Decision Support for
the U.S. Army Corps of
Engineers, Missouri River Basin***

Barb Mayes Boustead

National Weather Service Omaha/Valley, NE

DSS by Fortuitous Partner Engagement

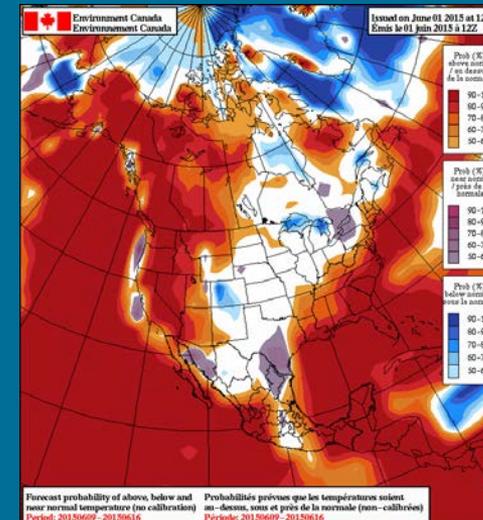
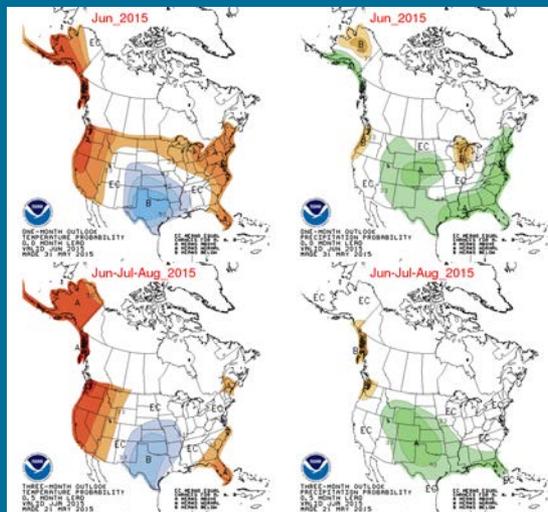
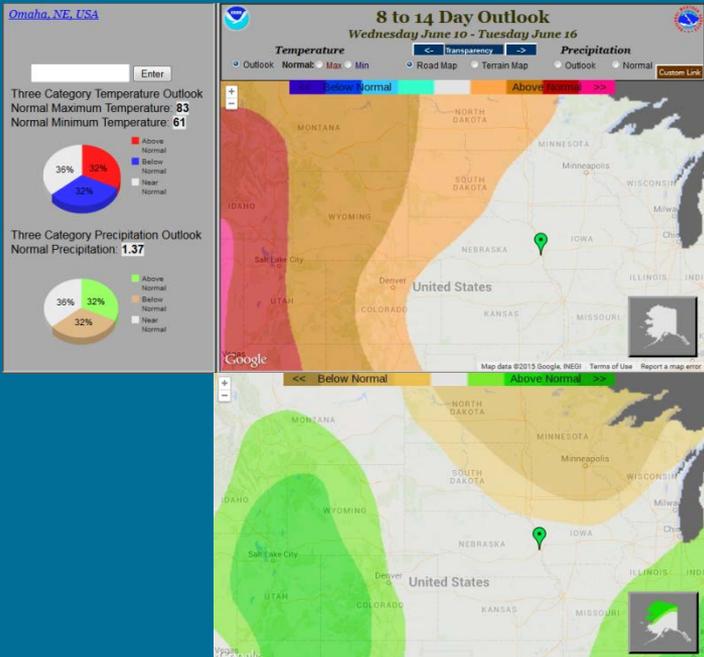
Corps: “Yeah, we look at some climate outlook information.”

Service Hydrologist: “From where?”

Corps: “I don’t know.”

Service Hydrologist: ...

Information Provided



Weeks 2-4 – in time to make decisions to increase or decrease releases from reservoirs

Questions?

Please contact:

***Barb Mayes Boustead
Meteorologist/Climate Program Leader***

NWS Omaha/Valley, NE

(402) 359-4381

barbara.mayes@noaa.gov



Using Climatology to Improve Forecast Methodologies and DSS Messaging

*Benjamin Daniel Sipprell
(benjamin.sipprell@noaa.gov)*

*Journeyman Forecaster
National Weather Service
Weather Forecast Office – Taunton, MA (BOX)
May 9th – 12th, 2016*

Why Apply Climatologies?



Forecast



Event Reviews
Lessons Learned
Best Practices



Calibrated Tools
Defined Thresholds
Impacts Catalog



Messaging

From local research / FACETs / Hazard Services

- EM's looking for details of threat(s) and impact(s) expected; significance
- EM's wanting trigger points, forecast confidence
- EM's requiring a heads up well in advance
- Passing message to constituents, pushing info



Using climatologies and getting down to the local level, using perspectives

- We can improve upon how people react to our forecasts / warnings
- Better communicate risk, prompt action

A Three-Step Process

Bring climate down to the local level



Gather Resources

- *Observational Networks*
- *Storm Reports / Impacts*
- *NRCC / NCEI / LCAT*
- *xmACIS / ThreadEx*
- *EDADS / EV2*



Collaborate

- *Local & State EM's*
- *Private & TV Meteorologists*
- *WFOs / NRCC / NCDC*

- *NWSChat*
- *Workshops*

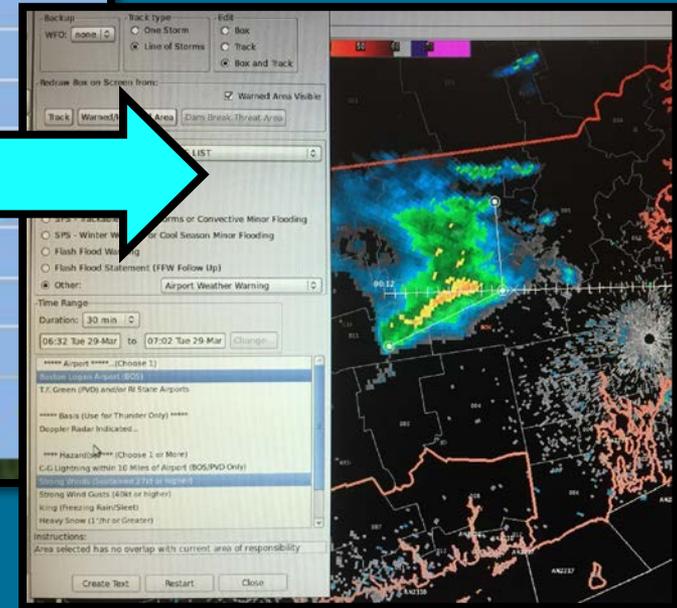
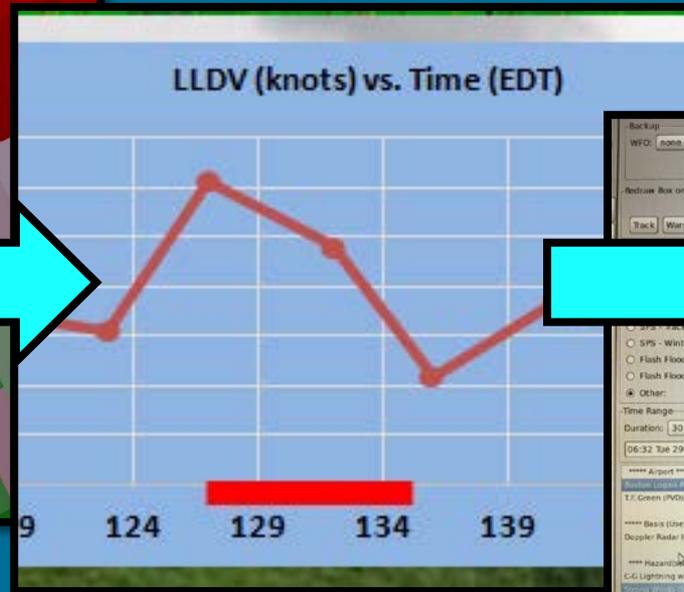
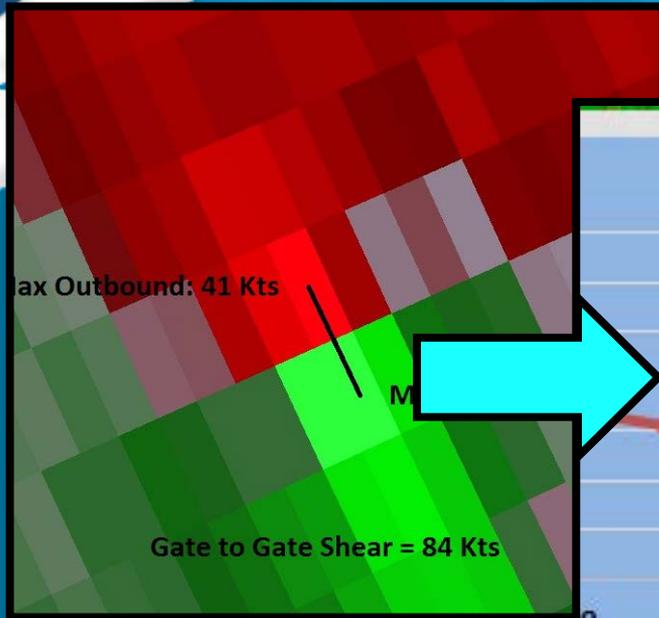


Integrate & Publish

- *Local Tools*
- *Precautionary / Preparedness Actions*
- *Best Practices / Forecast Strategies*

- *Web Resources*
- *Event Reviews / Maps*
- *Social Media*

Tornado Climatology



Problem: Missed tornado events.

Research: Collaborating with Ryan Hanrahan (WVIT NBC Hartford CT), evaluated V_{rot} / N_{rot} / CC / ZDR in tornado-producing storms across NY / MA / CT.

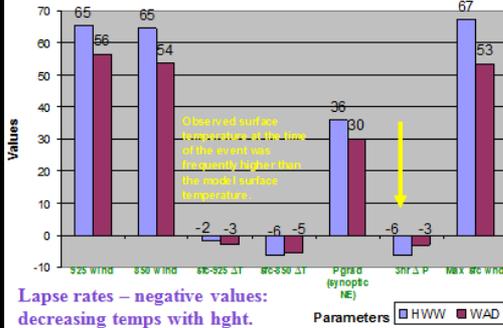
Outcome: Tornado warnings considered at thresholds of V_{rot} at 30, $N_{rot} > 0.8$; radar confirmed tornado with collocated low CC, ZDR near zero; improved WarnGen practices, hazard wording; environment/storm-type consideration.

Wind Climatology



SOUTH CASES

S-Cases HWW vs WAD

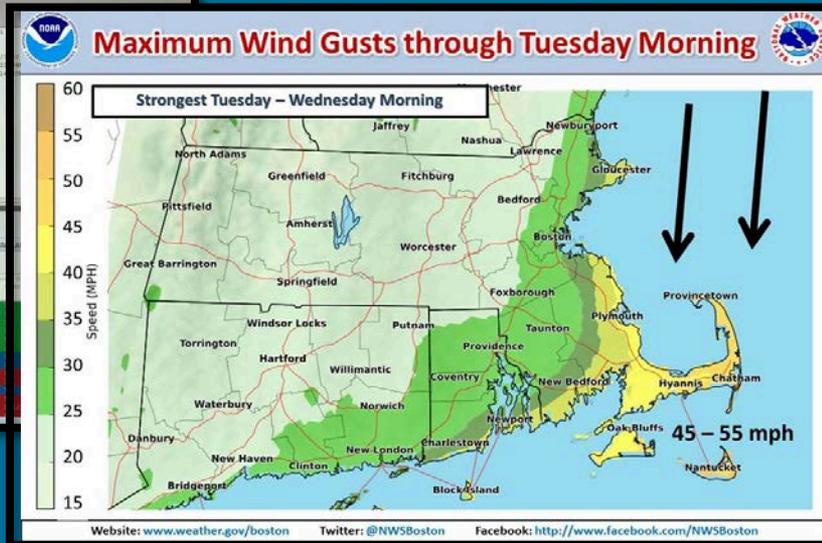


Observed surface temperatures along line of the event was frequently higher than the model surface temperatures

Lapse rates – negative values: decreasing temps with hght.

Parameters HWW WAD

HWW – HIGH WIND WARNING
WAD – WIND ADVISORY



Problem: Identifying the potential for hazardous winds.

Research: Evaluating several parameters that include low level winds, lapse rates, pressure couplets within previous wind events that met or exceeded criteria.

Outcome: Locally derived averaged parameters dependent on wind direction; serve as conditions of note towards issuance of wind hazards; aid in forecaster confidence.

Coastal Climatology



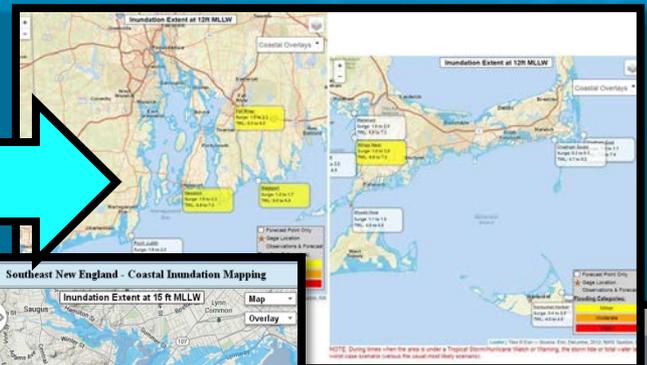
WICKED
HIGH
TIDES



Nantucket - East Shore (Estimated Erosion Impact)

Storm Tide*	Wave Height*				
	2	10	15	20	25
4.0	-	-	-	-	-
4.5	-	-	-	-	-
5.0	-	-	-	-	-
5.5	-	-	-	-	-
6.0	Minor	Minor	Minor	Moderate	Minor
6.5	Minor	Minor	Moderate	Moderate	Minor
7.0	Minor	Moderate	Moderate	Moderate	Minor
7.5	Moderate	Moderate	Moderate	Moderate	Minor
8.0	Moderate	Moderate	Moderate	Moderate	Minor
8.5	Moderate	Moderate	Moderate	Moderate	Minor
9.0	Moderate	Moderate	Moderate	Moderate	Minor
9.5	Moderate	Moderate	Moderate	Moderate	Minor
10.0	Moderate	Moderate	Moderate	Moderate	Minor
10.5	Moderate	Moderate	Moderate	Moderate	Minor
11.0	Moderate	Moderate	Moderate	Moderate	Minor
11.5	Moderate	Moderate	Moderate	Moderate	Minor
12.0	Moderate	Moderate	Moderate	Moderate	Minor

*max forecasts



Problem: Under- or over-performing on coastal impacts.

Research: Field studies after every event, working with local emergency managers to ascertain morphology of impacts.

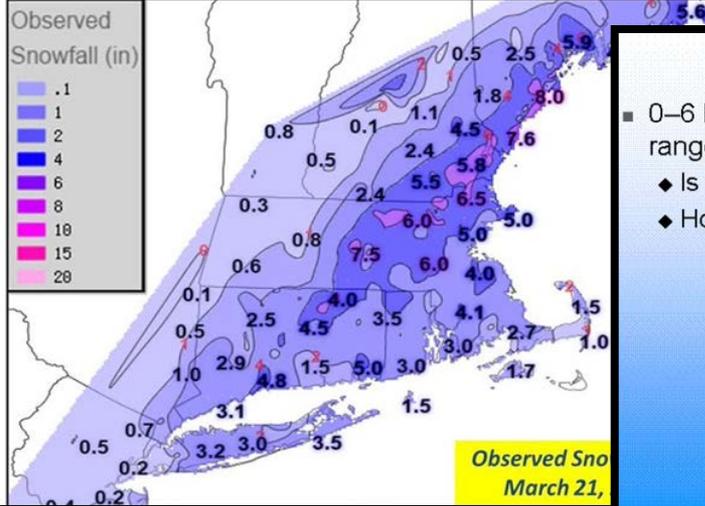
Outcome: Coastal flood impact rubrics via water levels and wave heights defined from staff experience and local studies; incorporated into coastal hazards / inundation mapping webpage, in-house tools.

Winter Climatology



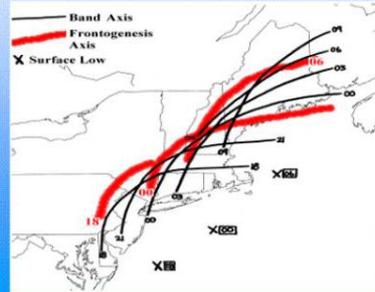
XXX

March 20-21, 2016 Snowfall Map



Forecast Strategy

- 0–6 h: anticipate band evolution by monitoring range guidance
 - ◆ Is the band developing?
 - ◆ How is the frontogenesis field expected to evolve?



Highlights

What	Where	Timing	Impacts
Heavy Snow Widespread 1-2 ft	Most of Southern New England with areas up to 3 ft possible 2-4" / hr snowfall rates Thundersnow possible	This Evening – Tue Evening Heaviest snowfall Late tonight into Tuesday morning	Travel – becomes difficult late today then dangerous & nearly impossible early Tue White-out Conditions Blowing & Drifting Snow
Damaging Hurricane Force Wind Gusts Highest 60-80 mph	Eastern MA & RI Strongest Coastal Plymouth, Cape Cod & the Islands	Tonight – Tue night Strongest winds late tonight into Tuesday afternoon	Downed trees & power lines Extended power outages Potential structural damage
Moderate – Major	E & SE Coastal MA	Multiple Tide Cycles Tue Early Morning	Moderate to Major Coastal Flooding and Beach Erosion

Problem: Capturing mesoscale banding, snow-squalls, ocean-effect snows, precipitation-type issues.

Research: Post-event reviews, climatological storm tracks, collaboration and incorporation of local area studies, xmACIS, AWSSI.

Outcome: Forecast strategies and playbooks; continual review pre-season with winter weather workshops; advancement of forecast tools to account for inherent forecast challenges.



Using Climatology to Improve Forecast Methodologies and DSS Messaging

*Benjamin Daniel Sipprell
(benjamin.sipprell@noaa.gov)*

*Journeyman Forecaster
National Weather Service
Weather Forecast Office – Taunton, MA (BOX)
May 9th – 12th, 2016*

Providing an Impact Based Week 2 Outlook for the State of Texas ... Focusing on the “I” in IDSS

NWS National Climate Services Meeting

Thursday, May 12, 2016

Brian Hoeth, Jennifer McNatt, Mark Wiley, Kurt Van Speybroeck

NWS Southern Region Headquarters

Regional Operations Center (SR ROC)

Victor Murphy

NWS SR Climate Services Program Manager

David Brown

NOAA National Centers for Environmental Information (NCEI)

WHY do the Experimental Week Two Outlook?

1. *The state asked for it!*

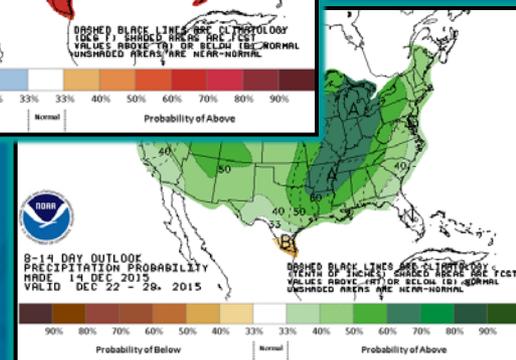
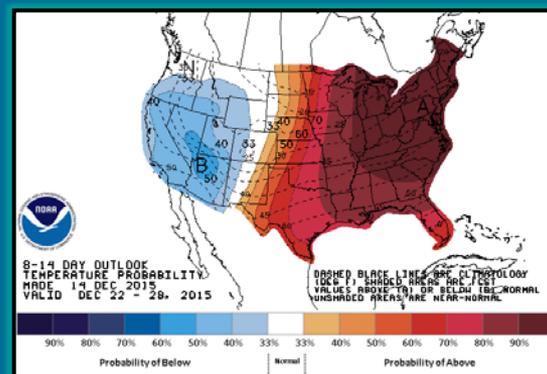
- Early heads up of potential hazards
- Any reasonable chance?

2. Interpreting into *IMPACTS*

- Above normal precip means what ??
- How MUCH above normal?
- What kind of precip?
- Should I worry about this?

3. *“Fill the gap” between weather & climate*

- Week 1: WFOs, RFCs, WPC, Inches of Precip
- Week 2: CPC, Above/Below normal precip
- Deterministic vs. Probabilistic





*SEVERITY of Hazards This Week



Disclaimer: For internal TX planning purposes only.
Not considered an official NWS forecast.

Valid: April 6th – April 12th

DAY/ THREAT	WED	THU	FRI	SAT	SUN	MON	TUE
Severe Storms						NW/N TX	
Heavy Rain / Flooding							
Winter							
Fire Weather	TX Panhandle NW TX						
River Flooding	East/Southeast TX						→

* Graphic depicts the potential SEVERITY of a particular hazard occurring THIS week

- No Weather Threats Expected
- Very Common – Happens Often
- Common – Happens Frequently
- Uncommon – A Few Times a Year
- Rare – Once Every 1-5 Years
- Very Rare – Once Every 5-10 Years

Discussion: A cold front will move through north/east TX Wednesday with little moisture to work with...the primary impacts from this front will be elevated fire weather conditions behind the front across the TX Panhandle and NW TX. Weather will then be relatively quiet across the state through Sunday mid-day before another springtime storm system moves across the state late Sunday through Monday. Much needed rain will be possible over the TX panhandle late Sunday into Monday and strong to severe thunderstorms will be possible for northwest into north TX on Monday.

State of TX asked for Week 1 & Week 2 info together, so we include both in this product

Week 1 is SEVERITY (Deterministic) based and provides nice context prior to reviewing the Week 2 assessment



*CONFIDENCE of Hazards Next Week



Disclaimer: For internal TX planning purposes only.
Not considered an official NWS forecast.

Valid: April 13th – April 19th

CONFIDENCE that hazard will occur	Severe Weather	Flash Flooding	Fire Weather	Drought Intensifying	Unusually COLD	Winter Precipitation	Tropical System	Unusually HOT
High								
Medium	North & East TX						Category Out of Season	Category Out of Season
	TX Panhandle		West & South TX	West & South TX				
Low		North & East TX						

* Graphic depicts the CONFIDENCE level of a particular hazard occurring NEXT week
 * Graphic does *not* convey the potential severity of the particular hazard

Discussion: Long range models are indicating an active weather pattern for mid-April. A series of storm systems will move across the state in the April 14-16 time period resulting in increased precipitation chances across much of the state. There is a severe storm potential over the TX panhandle with a slightly higher confidence in severe storms over north and east TX. Widespread heavy rain does not appear likely but some isolated flooding potential is possible over saturated areas in north and east TX. Areas over west and south TX will miss out on much of the rain so we have indicated fire weather/drought concerns over these areas.

Matrix design grown out of WFO Jackson MS week 2 prototype
Balances CONFIDENCE/Certainty with degree of severity
CPC and many other tools used to produce assessment
Attempts to answer “So You’re Telling Me There’s a Chance?”

Initial Conclusions - Positives

1. *Meets an identified core partner need*

- They want **impacts** based info beyond day 7

2. *Promotes sustained regional interaction with CPC*

- Success story from CPC/SR ROC meeting in July 2015
- SR ROC has input/interaction during weekly CPC Hazards call on Tuesdays

3. *Promotes sustained regional interaction with WFOs/RFCs*

- ROC provides draft to WFOs/RFCs in TX for review
- WFOs/RFCs in TX are aware of what the ROC is providing to the state

Initial Conclusions - Challenges

1. *Translating 8-14 day CPC guidance into impacts*

- Lacks context (e.g. “heavy rain” needs geographical relevance)
- How much above/below normal?
- Winter and tropical not included
- Hazards Outlook misses the low probability events

2. *Balancing all tools/guidance available into 1 cohesive impacts based product*

- “Operational”
 - *CPC 8-14 day Temps/Precip/Hazards/Tropical*
 - *Models – GFS, ECMWF, etc.*
- “Experimental” – Research to Ops
 - *SPC / IRI CFS Severe Wx Guidance Dashboard*
 - *ESRL GEFS Reforecast Data → PQPF!*
 - *Ensemble Situational Awareness Tool → Anomalies!*
 - *CIPS Analogs*

Any Questions?

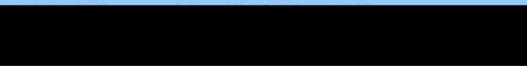
NWS SR Regional Operations Center (ROC) Fort Worth, TX



Phone: (817) 978-1100 x147
or direct at (682) 703-3747

E-mail: sr-srh.roc@noaa.gov

NWSChat: "sr-roc" room



facebook	https://www.facebook.com/NWSSouthern
twitter	@NWS_Southern_US https://twitter.com/NWS_Southern_US

We are physically staffed (CT):

- Monday – Friday: 5am-7pm
- Saturday – Sunday: 7am-5pm
- Outside of those hours, call the number listed above and press "0" to reach us immediately (or leave a message and we'll get it when we get into the office)

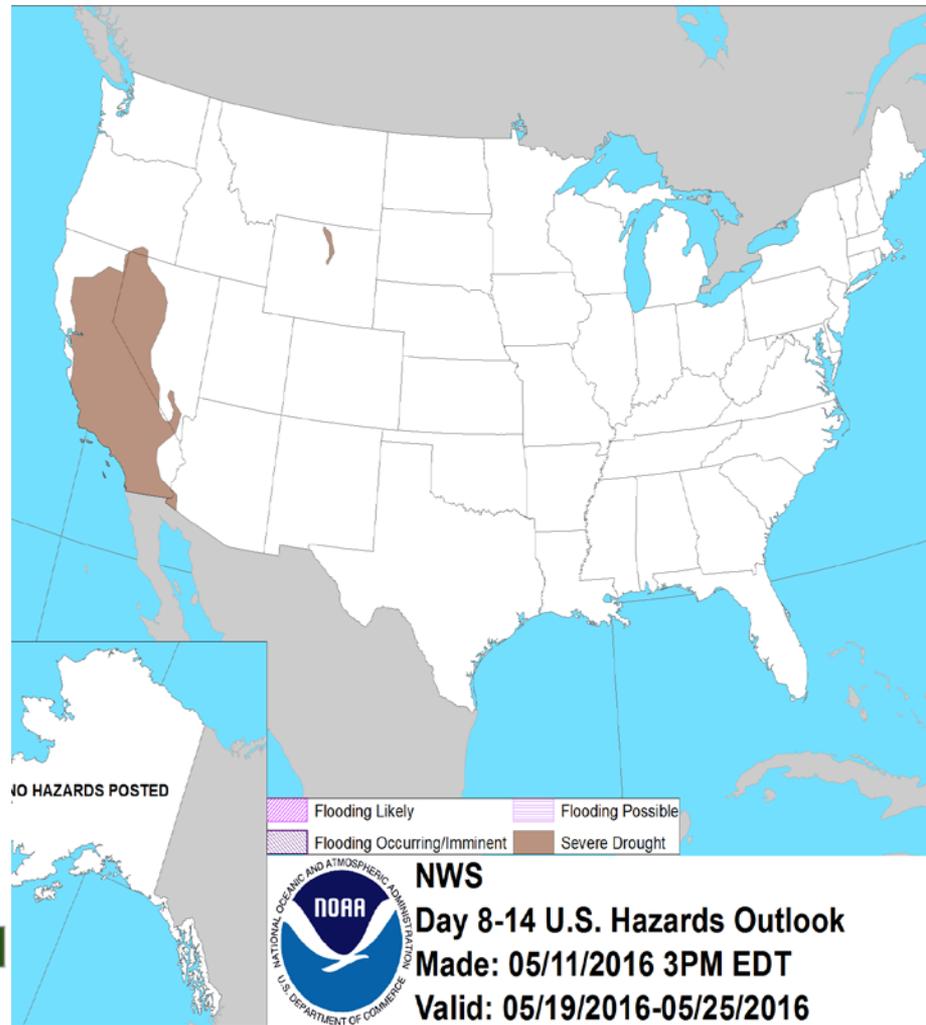
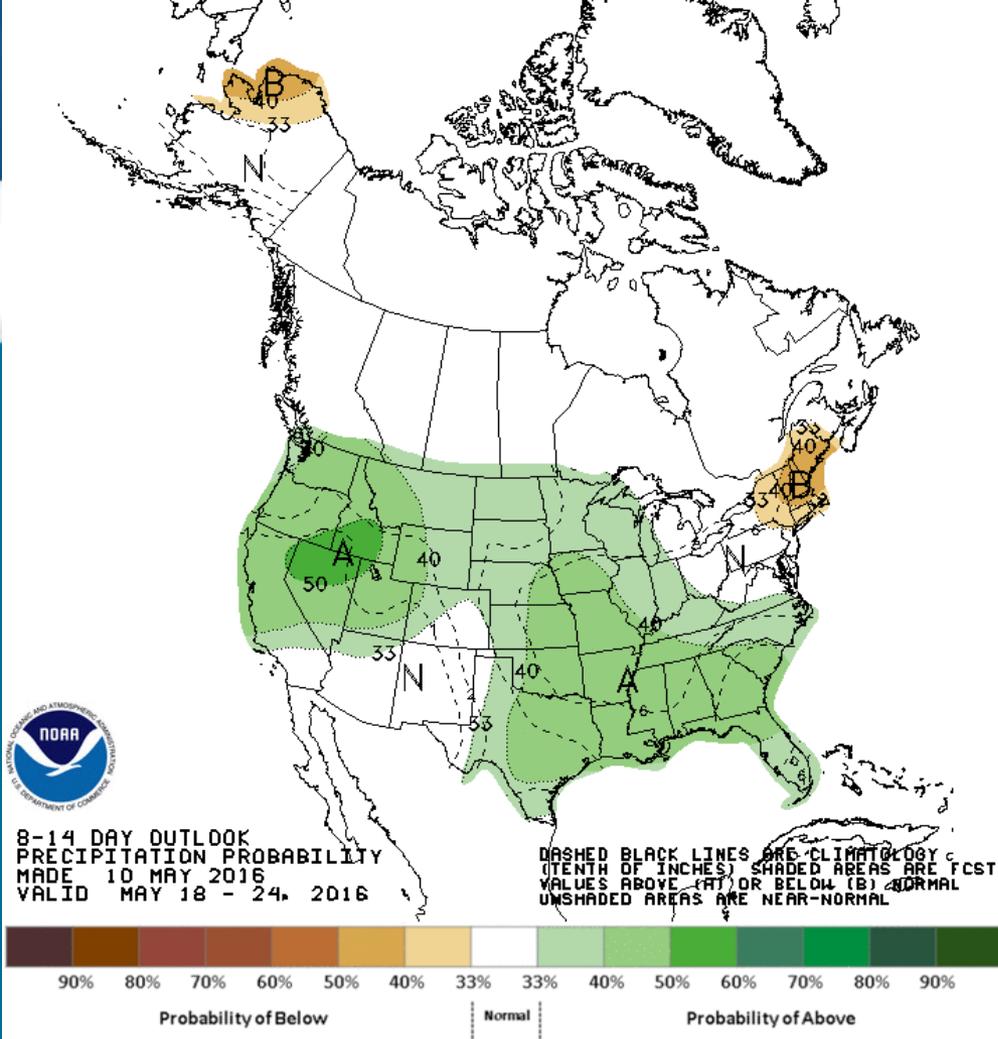
For reporting information to the ROC, please go to:

<https://sites.google.com/a/noaa.gov/nws-sr-roc/os>

Send questions/feedback to:

Brian.Hoeth@noaa.gov

Backup Slides

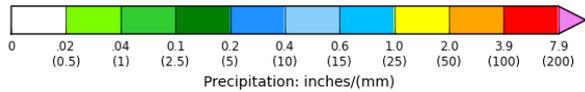
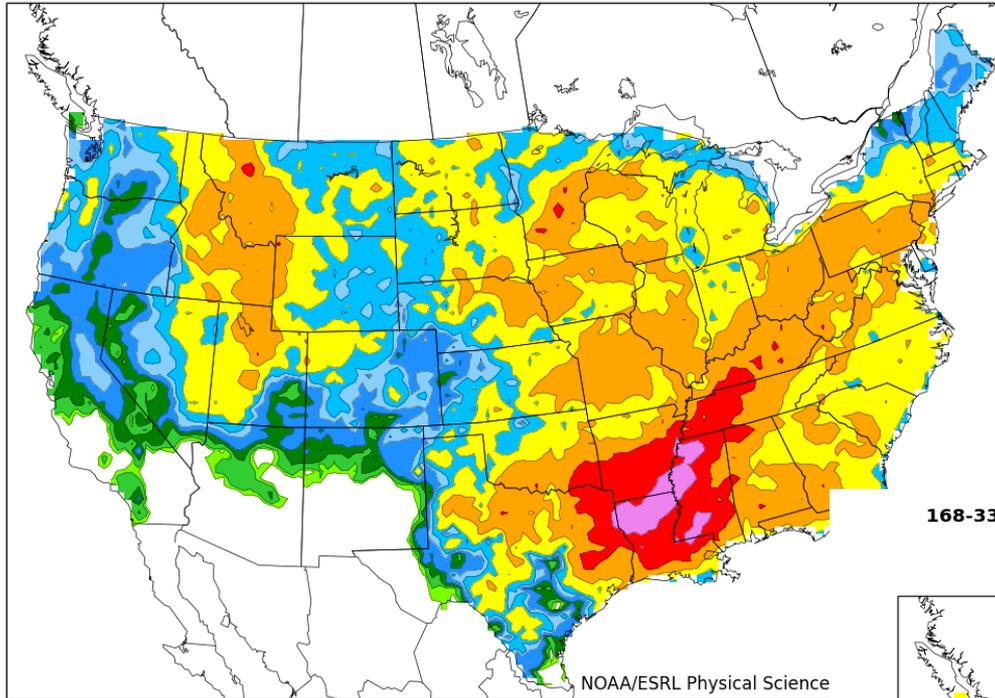


For Thursday May 19 - Wednesday May 25: Locally heavy rain may linger across the lower Mississippi Valley into the beginning of the Week-2 period. Since the 6Z GFS and 0Z ECMWF ensemble means diverge on the location of the heaviest rainfall beyond day 7, no heavy rain hazard is depicted on the Week-2 map.

168-336hr fcst from 00Z Wed May 11. Valid 00Z Wed May 18 - 00Z Wed May 25

Calibrated with 1985-2010 Reforecast2 data.

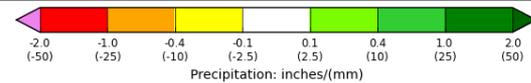
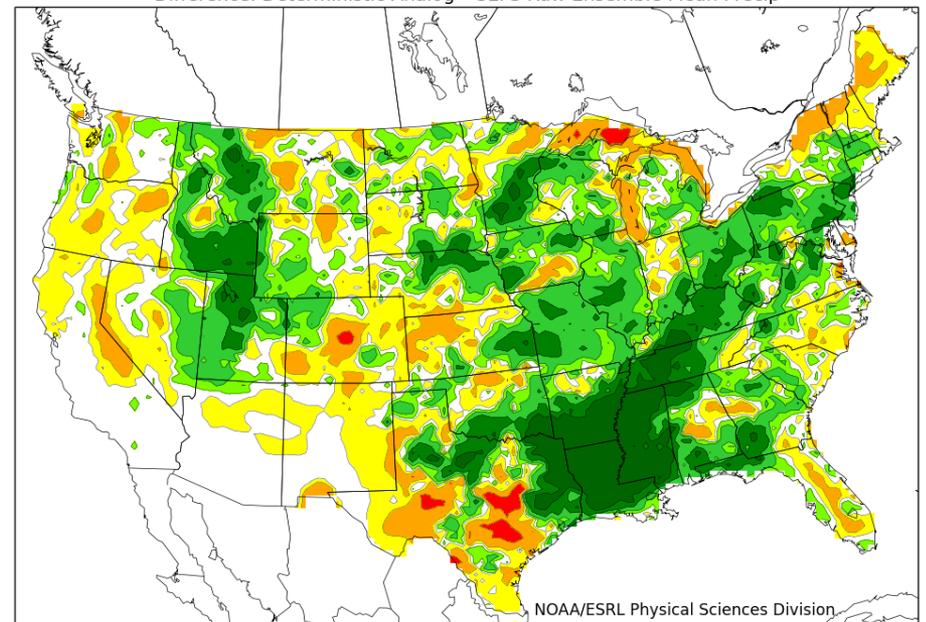
Deterministic Precipitation, from Analogs



168-336hr fcst from 00Z Wed May 11. Valid 00Z Wed May 18 - 00Z Wed May 25

Calibrated with 1985-2010 Reforecast2 data.

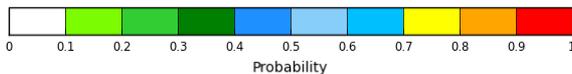
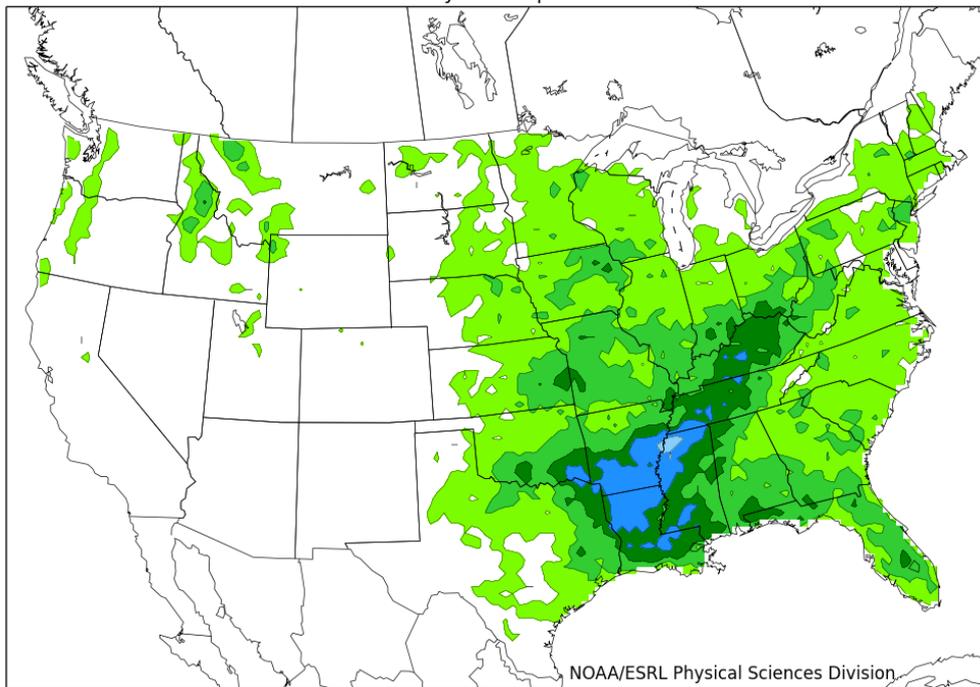
Difference: Deterministic Analog - GEFS Raw Ensemble Mean Precip



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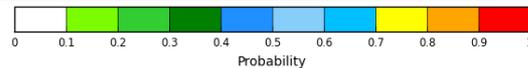
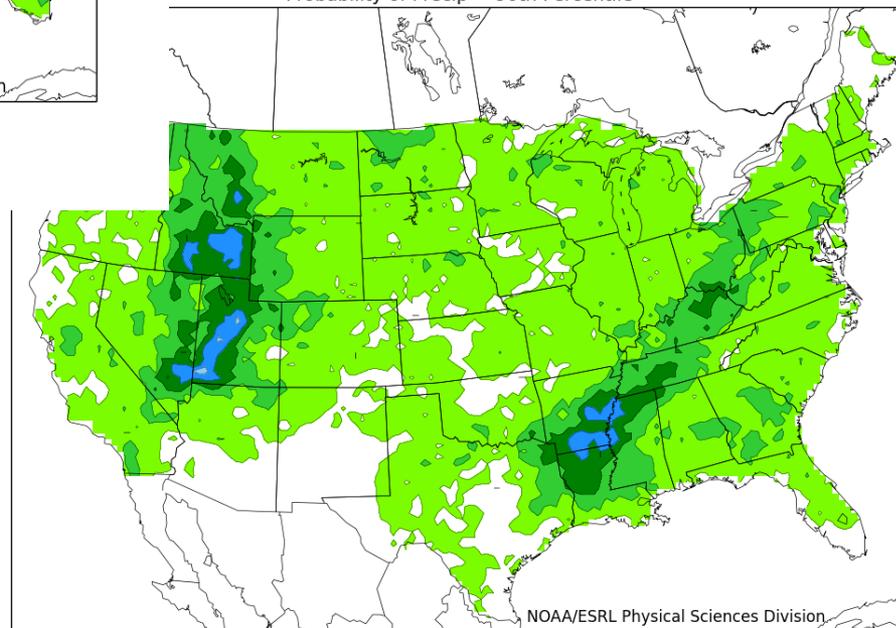
Probability of Precip > 50mm



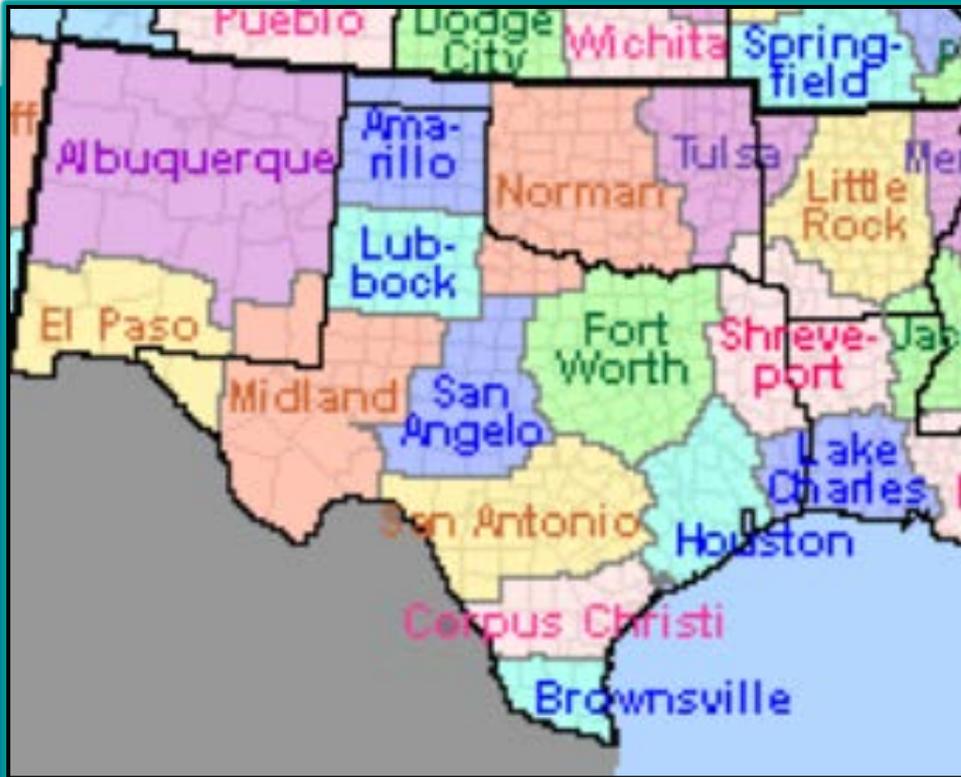
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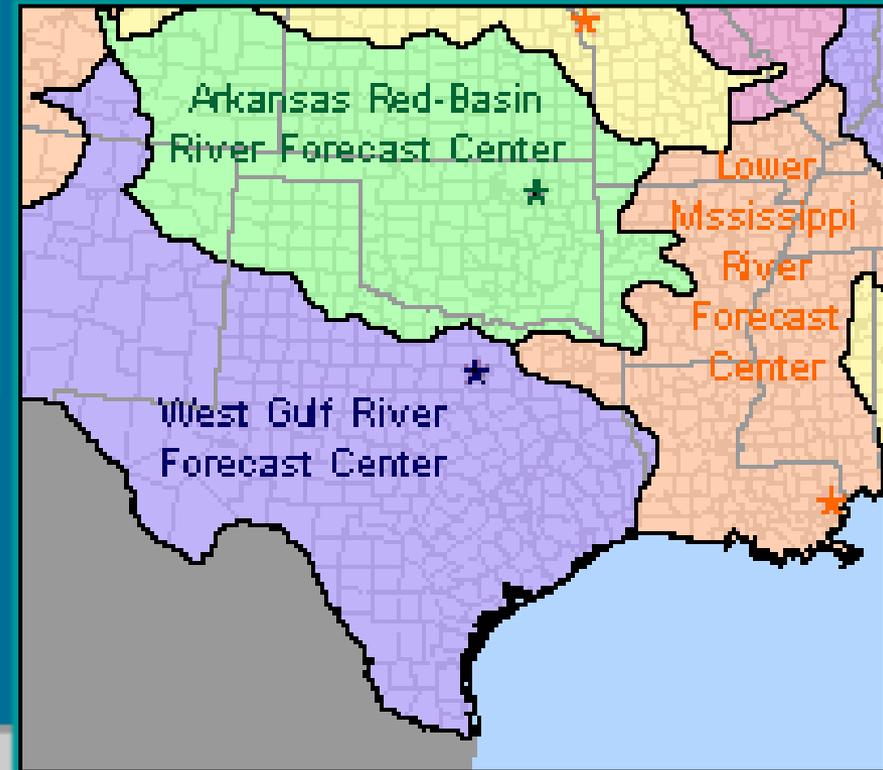
Probability of Precip > 90th Percentile



State of Texas Sup



13 WFOs and 3 RFCs cover Texas!



SR ROC coordinates with all TX WFOs and RFCs to provide briefings and IDSS to the State of TX

Andrea Bair

Here is the link for the GIS Story Maps....

<http://noaa.maps.arcgis.com/apps/MapSeries/index.html?appid=7c068f2f7f2b4c8692570c22d38f9ab6>