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AzCRH www.crh.arizona.edu
Marc J. Singer
Meteorologist in Charge
National Weather Service

National Weather Service - An Introduction and the Latest Seasonal Outlooks
The National Weather Service
An Introduction and the Latest Seasonal Outlooks

Marc Singer
Presentation Summary

- Who We Are
- What We Do
- Monsoon Outlook and Beyond
Organizational Hierarchy

Department of Commerce

National Oceanic and Atmospheric Administration

National Weather Service
We Are on Campus!
NWS Weather Forecast Offices

- 122 WFOs
- Structure remains the same since the 1990s
River Forecast Centers

- 13 RFCs
NWS Regional Headquarters

- 6 Regional Centers
NWS National Centers

National Centers for Environmental Prediction

- Climate Prediction Center
- Environmental Modeling Center
- Weather Prediction Center
- Aviation Weather Center
  Kansas City, Missouri
- Ocean Prediction Center
- NCEP Central Operations
- National Hurricane Center
  Miami, Florida
- Space Weather Prediction Center
  Boulder, Colorado
- Storm Prediction Center
  Norman, Oklahoma
What Questions Do You Have?
A Day in the Life at the NWS
NWS Mission and Vision Statement

Mission

Provide weather, water and climate data, forecasts, warnings, and impact-based decision support services for the protection of life and property and enhancement of the national economy.

Vision

A Weather-Ready Nation: Society is prepared for and responds to weather, water, and climate-dependent events.
Data Acquisition and Situational Awareness
Data Acquisition and Situational Awareness
Data Acquisition and Situational Awareness
Data Acquisition and Situational Awareness
Data Acquisition and Situational Awareness
Data Acquisition and Situational Awareness
Public Forecasts

- Graphical Forecasts of Weather Elements
- “Paint a Picture”
- Routine 2x a Day
- Occasional Updates
Aviation Forecasts

- Terminal Aerodrome Forecasts (TAFs)

- 24-30 hour forecasts of wind, weather, sky, low level wind shear

- Aviation Weather Center, CWSU also provide forecasts
Fire Weather Forecasts

- Specialized forecasts of temperature, RH, wind
- Red Flag Warnings, Fire Weather Watches
- Specialized briefings for fire weather community
Hydrology Forecasts

- Areal Flooding, Flash Flooding, River Flooding
- Debris Flows
Winter Weather Forecasts

- Winter Weather Warnings, Advisories, Watches
- Freezing Rain
- Lake Effect Snow
- Snow Squalls
What Questions Do You Have?
Changing Science and Technology in the NWS
Ensembles and Post-Processing

Increases in computing power have led to an explosion in numerical weather prediction ensembles and our ability to post-process their output

• Add value via bias correction, comparison to observed or model climate, clustering, etc.
Ensembles and Post-Processing
The National Blend of Models (NBM) is a multi-model, ensemble-based, and calibrated forecast product intended to be the starting point for NWS forecasts.

The NBM currently produces probabilistic output for some variables (e.g., precip, temp), allowing for much better decision support than a deterministic forecast.

- more information (albeit dated version) on production of NBM deterministic values, percentiles, etc.
National Blend of Models

NBM 48-h Snow Accumulation Forecast (Prob > 4")
Additional Forecast Tools
Decision Support Services (DSS)
“It should be understood that forecasts possess no intrinsic value. They acquire value through their ability to influence the decisions made by users of the forecasts.”

Allan Murphy, 1993
Decision Support - Quiet Season
**Decision Support - Briefings / Graphics**

**National Weather Service Tucson**

**Bighorn Fire Burn Scar Flash Flood Briefing**

<table>
<thead>
<tr>
<th>Date</th>
<th>Wed 7/22</th>
<th>Thu 7/23</th>
<th>Fri 7/24</th>
<th>Sat 7/25</th>
<th>Sun 7/26</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash Flood Threat</td>
<td>Moderate</td>
<td>High</td>
<td>High</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

Flash Flood Threat Matrix based on rain amounts of 0.50 inches in less than 1 hour on or near the burn scar.

**Today:**

Scattered showers and thunderstorms will result in a low-to-moderate threat for locally heavy rainfall over the Bighorn burn scar. Therefore, the Moderate or Orange category was selected for flash flooding potential.

**Thursday through Sunday:**

A strong southerly flow will import deeper moisture into the area. This will result in a ramp up of thunderstorm activity over the next several days, with the strongest thunderstorm days likely Thursday and/or Friday. The storms on Thursday and Friday will be capable of producing locally heavy rainfall which will bring an increased risk of flash flooding/mud flows on the Bighorn burn scar. Therefore, the High or Red category was selected for flash flood potential, slightly decreasing in risk Saturday and Sunday where a Moderate or Orange category was selected.

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**DEBRIS FLOW WARNING SIGNS**

- Rushing water and mud
- Unusual sounds including cracking, breaking roaring, or a freight train

Never Underestimate a Debris Flow
Decision Support - Incident Meteorologist
Decision Support - Emergency Operations Center
What Questions Do You Have?
Monsoon Outlook...and Beyond
What is the Monsoon?

- Seasonal shift in wind pattern
- Moisture comes from the Gulf of Mexico
June Outlook

Monthly Temperature Outlook
Valid: June 2023
Issued: May 31, 2023

Monthly Precipitation Outlook
Valid: June 2023
Issued: May 31, 2023
El Niño

NOAA
What is El Niño?

• Warm ocean waters along the equatorial Pacific Ocean

• Weakened trade winds

• Has large ramifications on global weather patterns, especially during the winter months
What is El Niño?

- Warm ocean waters along the equatorial Pacific Ocean
- Weakened trade winds
- Has large ramifications on global weather patterns, especially during the winter months
What is El Niño?

- Extended Pacific jet stream during the winter months
- Often wetter than normal conditions across the southern US
Upcoming Winter Outlook

Seasonal Temperature Outlook
Valid: Dec-Jan-Feb 2023-24
Issued: May 18, 2023

Seasonal Precipitation Outlook
Valid: Dec-Jan-Feb 2023-24
Issued: May 18, 2023
Thank You!

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