Regional Environmental Conditions & Impacts Coordination

NOAA West
May 25, 2016
Call Agenda

• Welcome

• El Niño and Regional Climate brief (D. McEvoy)

• Climatology Application (NANOOS)

• Environmental conditions and impacts update (T. Vann)

• NOAA West Watch Update (M. Milstein/T. Vann)

• Project Survey & Wrap – Discussion (T. Vann)
Temperature

May 1 – May 23, 2016

Oct 1, 2015 – May 23, 2016

water year to date
Precipitation

May 1 – May 23, 2016

Oct 1, 2015 – May 23, 2016

water year to date
Snow Water Equivalent

% of average SWE less meaningful late in the snow season

Example:

Lake Tahoe Basin: 177% of normal
May 24 normal: slightly above zero (<1 inch)
May 24 value: ~1 – 1.5 inches
Snow Water Equivalent

% of April 1 Average / % of Normal for This Date

STATE
Data as of May 25, 2016
Number of Stations Reporting 36
Average snow water equivalent (Inches) 3.5
Percent of April 1 Average (%) 12
Percent of normal for this date (%) 29

SOUTH
Data as of May 25, 2016
Number of Stations Reporting 27
Average snow water equivalent (Inches) 2.6
Percent of April 1 Average (%) 10
Percent of normal for this date (%) 21

CENTRAL
Data as of May 25, 2016
Number of Stations Reporting 40
Average snow water equivalent (Inches) 4.6
Percent of April 1 Average (%) 16
Percent of normal for this date (%) 37

NORTH
Data as of May 25, 2016
Number of Stations Reporting 29
Average snow water equivalent (Inches) 2.8
Percent of April 1 Average (%) 10
Percent of normal for this date (%) 31

County
Northern Sierra / Trinity
Central Sierra
Southern Sierra

Statewide Average: 12% / 29%

Source: CDEC/CA DWR
Seasonal Drought Outlook

U.S. Seasonal Drought Outlook
Drought Tendency During the Valid Period
Valid for May 19 - August 31, 2016
Released May 19, 2016

Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Use caution for applications that can be affected by short lived events. "Ongoing" drought areas are based on the U.S. Drought Monitor areas (intensities of D1 to D4).

NOTE: The tan areas imply at least a 1-category improvement in the Drought Monitor intensity levels by the end of the period, although drought will remain. The green areas imply drought removal by the end of the period (D0 or none).

Author: Adam Allgood
NOAA/NWS/NCEP/Climate Prediction Center

Drought persists
Drought remains but improves
Drought removal likely
Drought removal likely
Drought development likely

Source: CPC
http://go.usa.gov/3eZ73
Significant Wildland Fire Potential Outlook

Significant Wildland Fire Potential Outlook
June 2016

Above normal significant wildland fire potential indicates a greater than usual likelihood that significant wildland fires will occur. Significant wildland fires should be expected at typical times and intervals during normal significant wildland fire potential conditions. Significant wildland fires are still possible but less likely than usual during forecasted below normal periods.

http://www.predictiveservices.nifc.gov/outlooks/outlooks.htm
Significant Wildland Fire Potential Outlook

“A massive die off of heavy timber is occurring in the high country, especially the Sierra Foothills where over 50 percent of the old growth long needle pines are dying or are dead.”
-Predictive Services

http://www.predictiveservices.nifc.gov/outlooks/outlooks.htm
El Nino Status

- ENSO Alert System Status: El Niño Advisory/La Niña Watch

- El Niño is weakening

- Positive equatorial sea surface temperature (SST) anomalies are diminishing across the equatorial Pacific Ocean.

- La Niña is favored to develop during the Northern Hemisphere summer 2016, with about a 75% chance of La Niña during the fall and winter 2016-17.*

Credit: CPC
* Note: These statements are updated once a month (2nd Thursday) in association with the ENSO Diagnostics Discussion, which can be found here: http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/.
Current Sea Surface Temperatures

Weekly SST Anomaly

2016/05/08 - 2016/05/14

NOAA/ESRL/PSD

Base Period: 1981-2010

°C
Niño Region SST Departures (°C) Recent Evolution

The latest weekly SST departures are:

- Niño 4: 0.6°C
- Niño 3.4: 0.2°C
- Niño 3: -0.1°C
- Niño 1+2: 0.2°C
ENSO Forecasts

NMME Forecast for Nino 3.4 (scaling) IC= 201605

Source: NOAA/CPC
**ENSO Forecasts**

CPC/IRI El Nino forecast:

NMME models + other dynamical models + statistical models

Source: CPC/IRI
June U.S. Forecasts

Source: NOAA/CPC
U.S. Temperature Forecasts
U.S. Precipitation Forecasts

Source: NOAA/CPC
NANOOS: www.nanoos.org Climatology app

Sea Surface Temperature: April 2016
Mean Chlorophyll: March 2016
New ESP in coastal ocean for HABs!!
New ESP in coastal ocean for HABs!!
New ESP in coastal ocean for HABs!!

With funding from the IOOS Ocean Technology Transition project, the Subsurface mooring was modified to integrate a real-time harmful algal bloom detection system called the Environmental Sample Processor (ESP).

23 May 2016

Domoic acid

Credits: IOOS, NOAA, UW, NANOOS, etc.
Warmer…

Sea Surface Temps

NDBC 46005, Washington, Wa

- 1976–2015
- Seasonal cycle (N = 40 years)
- 2016 (12h smoothing)
- ±1 std
- Raw data (limited QC)
- ±2 std
More variation inshore…
Warmer air temperatures
Puget Sound deep waters continue off the charts warmer, by ~1.5 °C.
The high regional precipitation signal continues, fresher ~0.5 PSU.
…with the result of less dense waters than observed in 11-y record.
Regional Impacts Summary – 04/21 to 05/22

Reporting Status:
• 284 entries since July 1, 2015
• Last reporting period: 21 environmental conditions & regional impacts reported

Environmental Conditions Capture:
• El Niño
• Warm ocean temperature
• Domoic acid
• Record air temperatures
• Drought

Human & Ecosystem Impacts Capture:
• Energy sector - “normal” water year
• CA increases water allocations
• West Coast kelp forest collapse (coverage down 93%)
• Adverse impacts to ocean salmon productivity
• Salmon fishery closures (Puget Sound)
• Tribal fishery closures (Yurok)
• Shellfishery closures (razor clam)
• Changes to marine food web
• Species displacement
• Accelerated seasonal snowpack melt
• Tree mortality
**Headlines - May**

PD Editorial: The alarming emergence of 'urchintopia'

Warm Pacific continues to chop salmon numbers, affecting Idaho, Northwest

**“Normal” Water Year So Far In The Northwest**

Snowpack hit hard by record warmth
Seasonal melt begins weeks earlier than normal

**WESTERN WATER:**
Calif. hikes deliveries to highest level in 4 years

Water regulations ease, but drought still dominates in California

State Water Project increases allocations to 60 percent

Razor clam fishery closed

Sick Animals Again Crowd Marine Center

SeaWorld releases 9 rehabilitated sea lions

Warmer waters bring loggerhead turtles to Southern California

**Dry La Niña period likely to follow El Niño**

Tree deaths rise steeply in Sierra; drought and insects to blame

**CALIFORNIA:**
Tiny crabs invade state beaches

Yuroks widen fishing closures

La Niña is coming! Forecasts reveal massive pool of deep water moving across the Pacific could cause fall weather chaos

- NOAA animation shows pool of deep, cool water moving east in Pacific
- Researchers say this ‘slow-motion wave’ could signify developing La Niña
- La Niña brings unusually cold temperatures in the Equatorial Pacific
- Could create higher chance of dry winter in drought-stricken California

Humpbacks in San Francisco Bay give whale watchers a rare thrill
Impacts in Pictures

NOAA scientists look at a juvenile loggerhead turtle found in the Loggerhead Conservation Area off the coast of Southern California. (NOAA)

Humpback whales have been swimming into San Francisco Bay in unprecedented numbers during the past two weeks.

Tuna crabs washed up onto the beach at Shaw's Cove in Laguna Beach, Calif. Pelagic red crabs are usually found off Baja California but currents that are part of the El Nino weather pattern are sweeping them north.

Intense ponderosa pine mortality is seen in the Bass Lake area from an aerial survey by the U.S. Forest Service in August 2015. The trees likely died in 2014 but the mortality became evident a year later. U.S. Forest Service.
Telling Regional Stories – NOAA West Watch

El Niño storms boost California ski areas

Western ski areas are cheering the best snow season they have recorded in twelve years. A series of storms early in the season brought a large amount of snowfall to the Sierra Nevada and continued over a month of moist weather that has continued to the present. The storms have been a blessing for ski resorts and a boon for the ski industry.

Western weather

Storms have brought significant amounts of snow to the western United States, particularly the Sierra Nevada and the Cascades. The snowfall has improved winter conditions for ski resorts and created favorable conditions for ski touring and snowshoeing.

Shrinking Western Snowpack

Western snowpack levels are critically low, with many areas experiencing drought conditions. The snowpack is crucial for water supplies and is a key indicator of climate change.

Wildfire connections

The relationship between wildfires and drought conditions is well-documented. Drought increases the risk of wildfires, and wildfires can also contribute to drought conditions by removing vegetation that helps maintain soil moisture.

Stressed & dying forests

Forests in the western United States are under stress, with many areas experiencing tree mortality and forest die-off due to drought and climate change.

Insects

Insect pests are also a concern for forest health, with many species becoming more abundant due to climate change.

Fire potential

The potential for large wildfires is high due to drought conditions and the presence of dry, flammable fuels.

Record waves batter West Coast shorelines

Some of the largest waves recorded on the West Coast have battered coastal areas, including isolated outposts and homes, and caused damage in the last few months. The waves are being recorded at several sites along the coast, with the highest waves recorded in Oregon.

Rough conditions slow Columbia ship traffic

Rough conditions on the Columbia River have slowed down ship traffic. The river is currently at a low level, which is affecting shipping operations.

Distant algae bloom drives up U.S. salmon prices

A distant algae bloom off the west coast of the United States has increased the price of salmon. The bloom is located in the Oregon and Washington regions and has affected the salmon fishing industry.

Issue #3 in Draft.

Themes:

- Shrinking Western Snowpack
- Wildfire connections
- Stressed & dying forests
- Insects
- Fire potential
Survey Results

WRECIC Webinar Average Monthly Attendance (August – April): 26

Survey Distribution: 88

Survey Respondents: 28
- NOAA: 10
  - 7 NMFS
  - 2 OAR
  - 1 NOS
- Partner: 8
- Industry: 1
- No Info: 10

How many monthly WRECIC webinars did you attend?

<table>
<thead>
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<th>Webinar Attendance</th>
<th>1-3</th>
<th>4-6</th>
<th>7-9</th>
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<tr>
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</table>
Monthly Webinar

- 10 monthly briefings (Aug-May)
- Distribution list ~ 88. Average monthly attendance: 26

4 Elements: Regional climate summary; Regional impacts summary; special highlights; open discussion
Monthly Webinar

Conditions and Impacts Reporting Status

• 284 entries since July 1, 2015
• ~27 entries per month
• Primary source is E&E Newswire, followed by a review of NMFS media clips for impacts gaps

Regional Impacts Summary – 02/27 to 03/18

Reporting Status:
• 231 entries since July 1, 2015
• Last reporting period: 35 environmental conditions & regional impacts reported

Reminder: To report an impact email Timi Vann or Michael Milstein

Environmental Conditions Capture:
• Changing ocean conditions
• Warm ocean temperatures
• El Niño
  • CA dry & hot February but wet March
• Flooding
• Drought

Human & Ecosystem Impacts:
• Adverse marine food web (forage fish) impacts
• Commercial fishery harvests down or closed (sardines, coho, sild)
• Marine mammal strandings & reproduction
• Species displacement
• Water supply; reservoir storage improvements
• Flooding & transportation
  • Train derailments; road closures
• Tribal subsistence impacts:
  • Fallon Paiute-Shoshone (NV) - drought & water supply impacts on hunting & fishing
  • Stillaguamish (WA) - ocean conditions & fishery harvest
Storytelling may seem like an old-fashioned tool, today — and it is. That’s exactly what makes it so powerful. Life happens in the narratives we tell one another. A story can go where quantitative analysis is denied admission: our hearts. Data can persuade people, but it doesn’t inspire them to act; to do that, you need to wrap your vision in a story that fires the imagination and stirs the soul. -Harvard Business Review, 3/2014
What aspects of the WRECIC webinars are most important to you? (1 most important; 4 least important)

Answered: 27
Skipped: 1
What aspects of the WRECIC webinars are most important to you? (1 most important; 4 least important)

Of the respondents that attended 7-9 webinars

- El Niño and Regional Climate Summary
- Regional Impacts Summary
- Special Highlights
- Open Discussion

Of the respondents that attended 4-6 webinars

- El Niño and Regional Climate Summary
- Regional Impacts Summary
- Special Highlights
- Open Discussion

Of the respondents that attended 1-3 webinars

- El Niño and Regional Climate Summary
- Regional Impacts Summary
- Special Highlights
- Open Discussion
I know where to find the regional impacts and ENSO summaries, so I enjoyed any added value provided on these calls. Most of it came from the special highlights or discussion.

I really appreciated the special topics, and the impacts summaries.

I liked the engagement across offices and the development of shared perspective of what was going on.

I like the mix of it all the best. That is, the mix of regional and local. The mix of climate summary and impacts.

[Liked] People telling the story of their livelihood impacted by environmental changes, AND their approach to adapting, monitoring, and innovating their affiliated industry.
If the WRECIC webinars are continued in the future, how often should they be held?

Answered: 25
Skipped: 3

During a time of climate anomalies like the last 1.5 yrs, meeting monthly was extremely helpful as conditions were shifting relatively rapidly. As a member of the side of NOAA where impacts are felt (Fisheries), rather than the side who are observing climate conditions (Weather), it was extremely helpful to have a preview of likely future impacts to the resources.
It is important to tell stories, like those in the NOAA West Watch, that describe how people and places in the region are experiencing changing environmental conditions.

Answered: 27
Skipped: 1

The WRECIC effort to tell stories from the information resulting from this group just short of revolutionary when it comes to NOAA, and I'd love to see the work repackage and shared with a broader external audience. Videos and infographics would enhance the story telling and describe the value of NOAA, as well as cautionary tales increasing environmental awareness and safety, better than many of our current methods. In my mind this effort was a necessary first step to gain the raw materials for that One-NOAA story telling. Would be visionary to find support to continue this effort.
Overall, the WRECIC project is a good model for improving regional communication and coordination across NOAA and partner networks involved in monitoring and communicating changing environmental conditions and impacts, particularly during significant events.

Answered: 28

I do hope we're able to find some group within NOAA who has the time, resources, and mission to continue support for this. The demand is evident in how the attendance and content grew over time. I can see this building into an extremely informative venue for internal NOAA staff, and possibly fueling extremely valuable external communications for stakeholders.

Thank you all for organizing/hosting this series. It would be a shame to lose it.

I learned a lot from these webinars and hope they can continue.
Synthesis & Recommendations

Synthesis:
• The El Niño and Regional Climate Summary element is the most important part of the call overall; Open Discussion least important. Rankings differed across attendance groups making clear cut priorities hard to distinguish.
• Most respondents want a monthly webinar.
• NOAA West Watch type stories are relevant and needed.
• There is consensus that the WRECIC is a good model for improved communication in the region.
• Feedback included suggestions to expand outside of NOAA (and partners) to more stakeholders or the general public.

Recommendations:
• Reinstate the WRECIC seasonally, with calls every other month (3 Fall/Winter; 3 Spring/Summer).
• Provide supplemental funding to the Western Regional Climate Center to implement the WRECIC effort.
• Focus on regional climate summaries – particularly departures from normal, and El Niño/La Niña advisories; and region specific special highlights.
• Issue a NOAA West Watch – type communication focused on how people and places are experiencing environmental conditions 2X/year (e.g., Seasonally - 1 Fall/Winter retrospective and 1 Spring/Summer retrospective).
• **Longer-term:** If resources are available, consider increasing webinars to monthly and expanding to broader stakeholder group(s).
Questions, Comments or Parting Thoughts?

Housekeeping:
• Project archive: [http://wrcc.dri.edu/data-projects/](http://wrcc.dri.edu/data-projects/) or email timi.vann@noaa.gov

• BAMS Essay abstract accepted: The NOAA Western Region Environmental Conditions and Impacts Coordination: Making Sense of Regional Environmental Change. Target for draft: end of June.

• NOAA West Watch #3 expected to release by month’s end.

THANK YOU FOR YOUR PARTICIPATION!