

Regional Environmental Conditions & Impacts Coordination

NOAA West April 25, 2016

Call Agenda

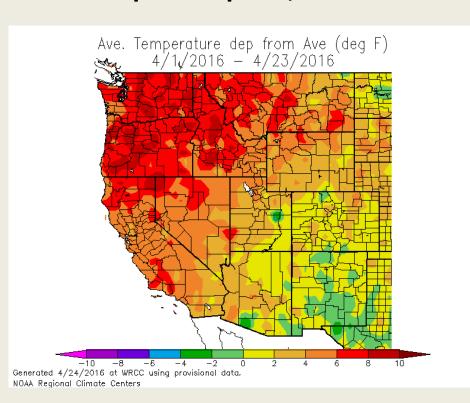


- Welcome
- El Niño and Regional Climate brief (D. McEvoy)
- Climatology Application (NANOOS)
- CeNCOOS update (D. Anderson)
- Environmental conditions and impacts reporting update (T. Vann)
- NOAA West Watch Update (M. Milstein/T. Vann)
- Project Wrap Discussion

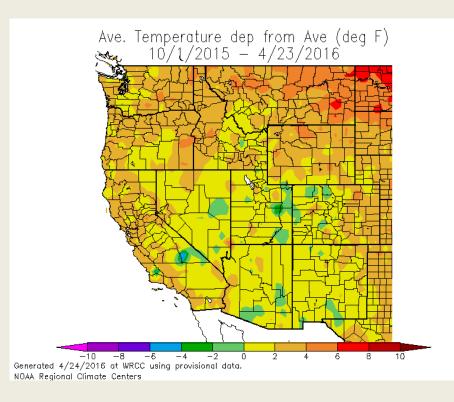
Temperature



Apr 1 – Apr 23, 2016



Oct 1, 2015 – Apr 23, 2016

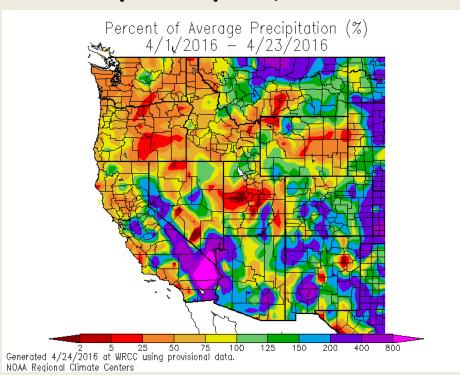


water year to date

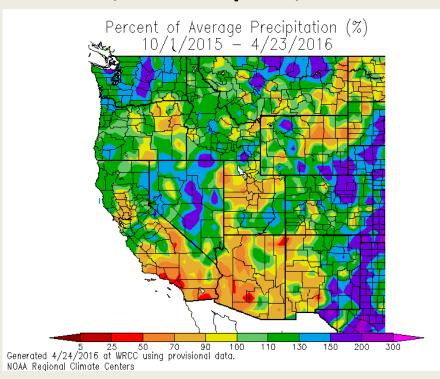
Precipitation



Apr 1 – Apr 23, 2016

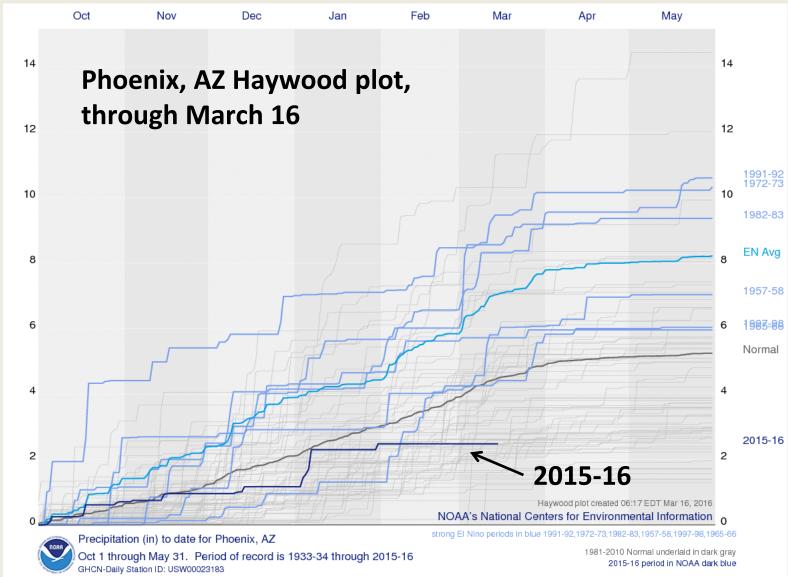


Oct 1, 2015 – Apr 23, 2016



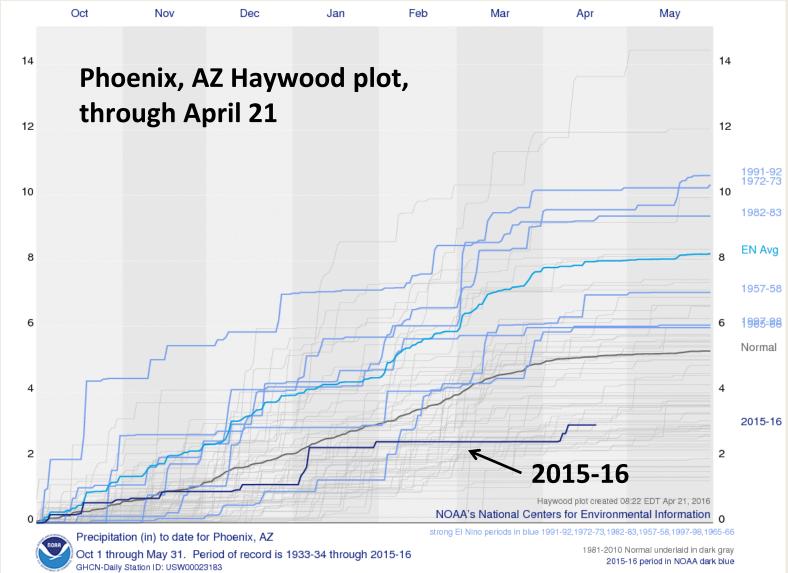
Precipitation





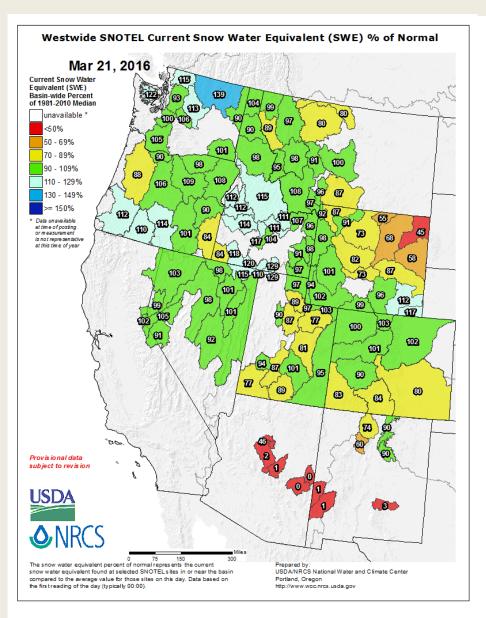
Precipitation

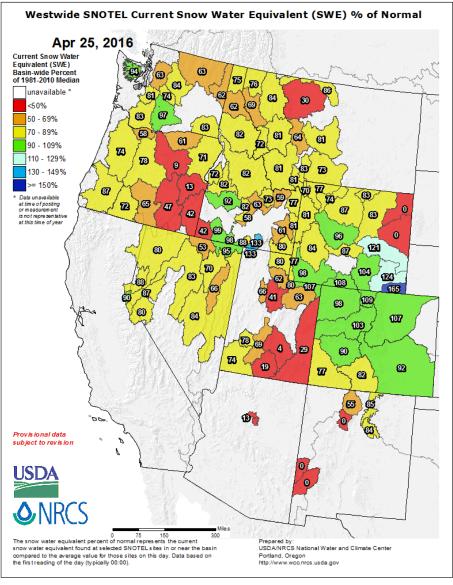




Snow Water Equivalent



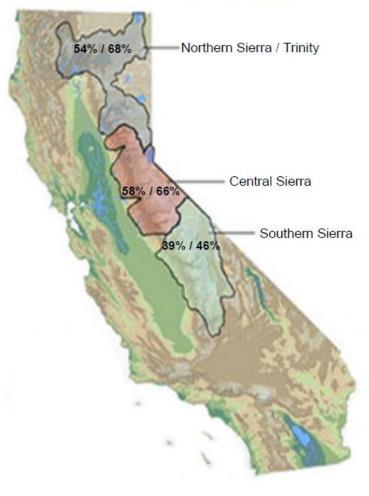




Snow Water Equivalent







NORTH	
Data as of April 25, 2016	
Number of Stations Reporting	26
Average snow water equivalent (Inches)	15.2
Percent of April 1 Average (%)	54
Percent of normal for this date (%)	68

CENTRAL	
Data as of April 25, 2016	
Number of Stations Reporting	40
Average snow water equivalent (Inches)	16.7
Percent of April 1 Average (%)	58
Percent of normal for this date (%)	66

SOUTH	
Data as of April 25, 2016	
Number of Stations Reporting	28
Average snow water equivalent (Inches)	10.5
Percent of April 1 Average (%)	39
Percent of normal for this date (%)	46

STATE	
Data as of April 25, 2016	
Number of Stations Reporting	94
Average snow water equivalent (Inches)	14.5
Percent of April 1 Average (%)	51
Percent of normal for this date (%)	60

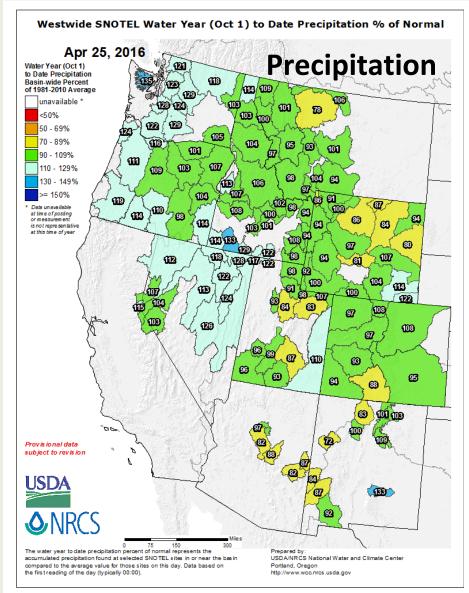
Statewide Average: 51% / 60%

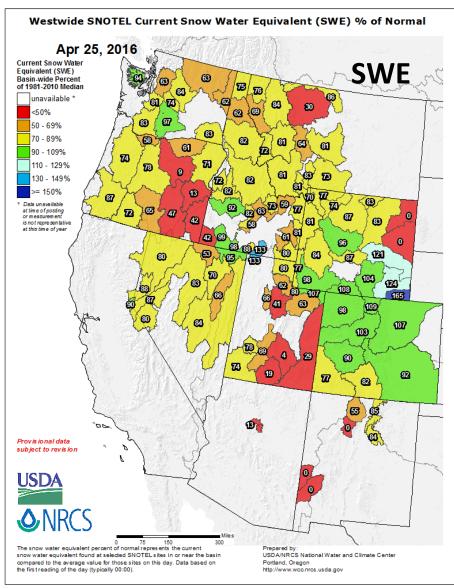
8

Source: CDEC/CA DWR

Snow Water Equivalent





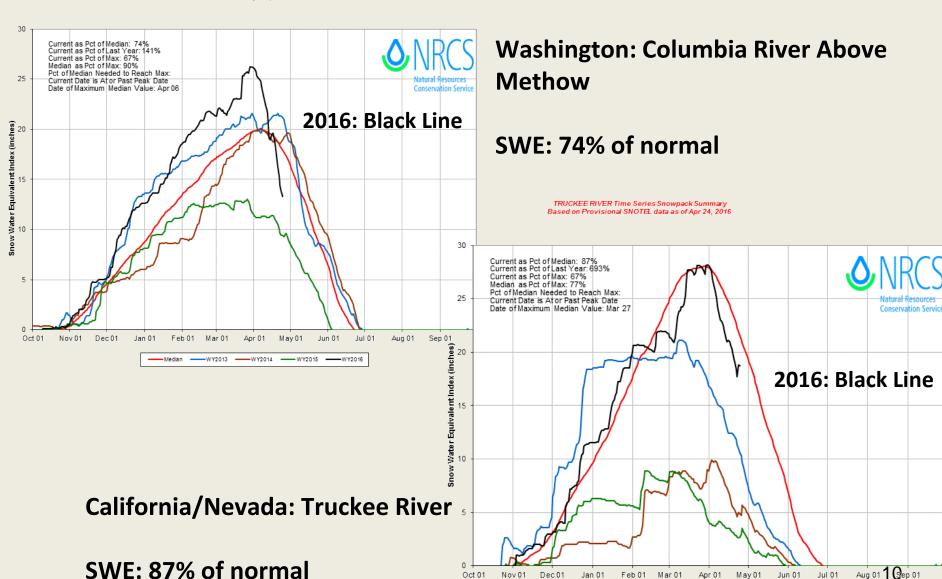


Snow Water Equivalent: April 23



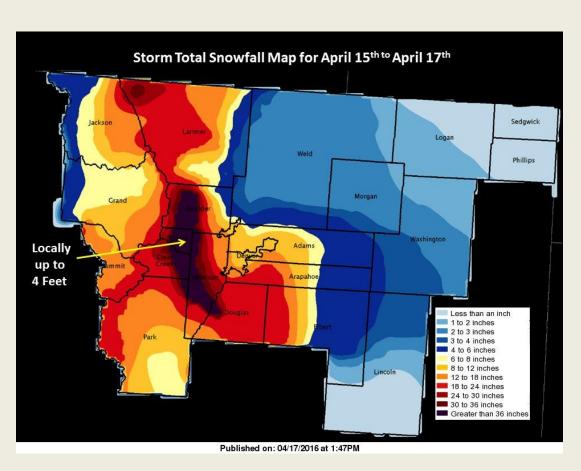
May 01

COLUMBIA ABOVE METHOW Time Series Snowpack Summary Based on Provisional SNOTEL data as of Apr 24, 2016



Colorado Front Range Snow Storm





	COMMINMENT OF COMM
Local Snow Reports (i	nches) 👟
4 SSE PINECLIFF	50.6
ST MARYS GLACIE	R 46
5 W CONIFER	45.5
2 NNE ASPEN SPRIN	IGS 45
13 NW GOLDEN	44.6
2 SE EVERGREEN	43.5
3 WSW CONIFER	42
3 SSE SILVER PLUI	ME 41.7
3 N CONIFER	41.3
GENESEE	41
3 SE PINECLIFFE	40.5
4 ENE NEDERLANI	40
data valid as of Sun 11-25 am - NW	'S Denver/Boulder

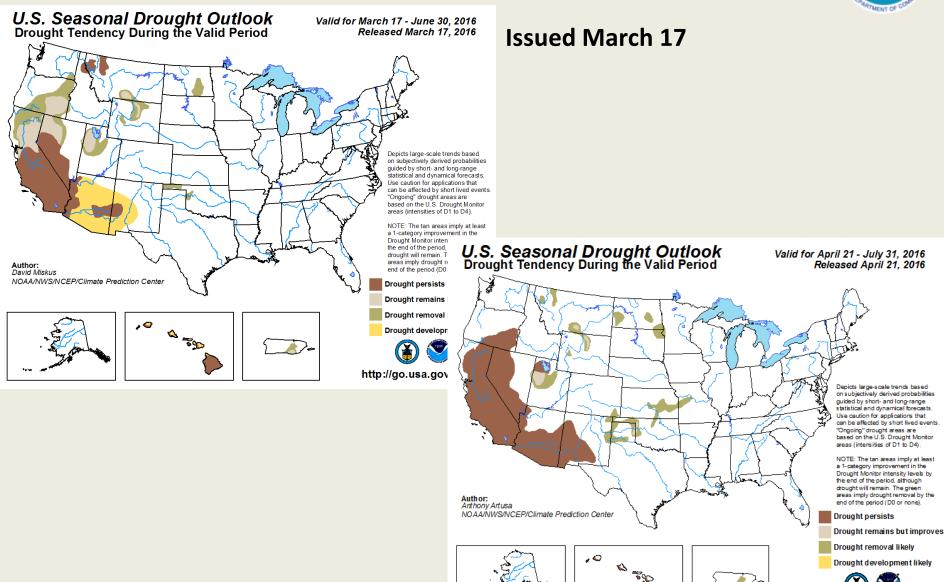
Published on: 04/17/2016 at 11:40AM

Source: NWS Boulder

Seasonal Drought Outlook



http://go.usa.gov/3eZ73



Issued April 21

Source: CPC

Drought and Wildfire



Effects of Drought/Precipitation on Fuels/Fire Season

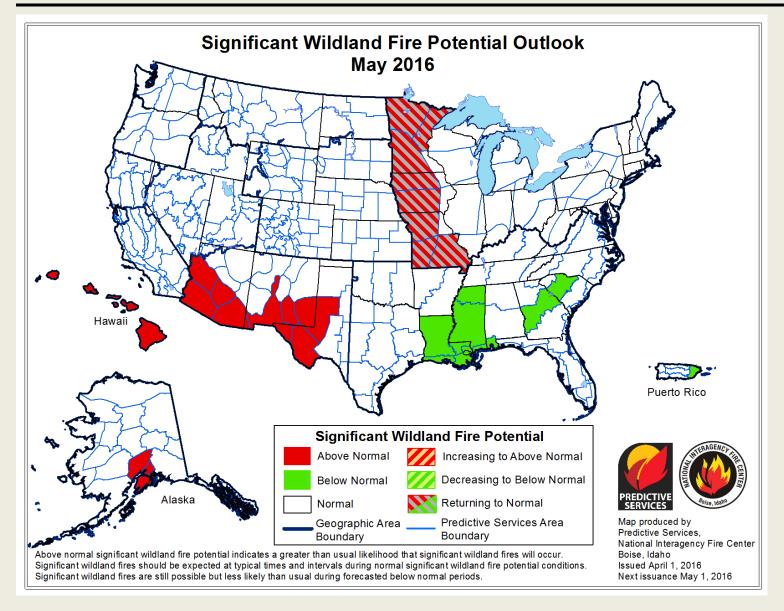
- Drought
 - Lower fuel moisture in fuels
 - Fuel moisture more "flashy" with response to quick increases/decreases in moisture
 - Drought stress in larger fuels, which become more combustible
 - Dry winter with low snowpack likely to allow carryover fuels.
 - Dry spring likely to limit fine fuel growth
- Spring Precipitation During/After Drought
 - Higher live/dead fuel moisture
 - Fuels still in drought will respond quickly to drying/warming
 - New fine fuel growth
- Entering/exiting drought tend to lead to increased severity in fire seasons, depending on summer weather pattern.

Drought not always a bad thing for Great Basin Fire seasons

Presented at the Great Basin Climate Forum, April 5, 2016 By Gina McGuire

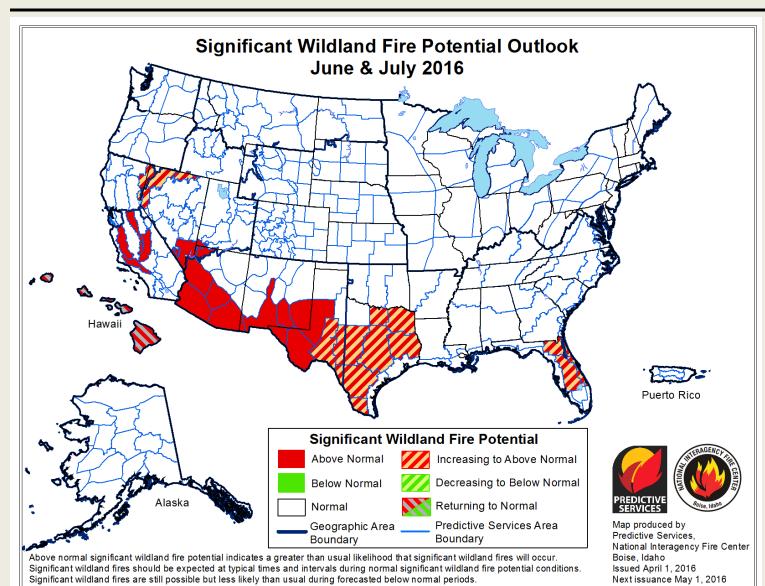
Significant Wildland Fire Potential Outlook





Significant Wildland Fire Potential Outlook





"In Southern California significant tree mortality among the conifers between three and six thousand feet in the Sierra will result in more dead material and will be the focus for this year's fire season." -Predictive Services

El Nino Status



- ENSO Alert System Status: El Niño Advisory/La Niña Watch
- A strong El Niño is present and weakening
- Positive equatorial sea surface temperature (SST) anomalies continue across most of the Pacific Ocean.
- A transition to ENSO-neutral is likely during late Northern Hemisphere spring or early summer 2016, with an increasing chance of La Niña during the second half of the year.*

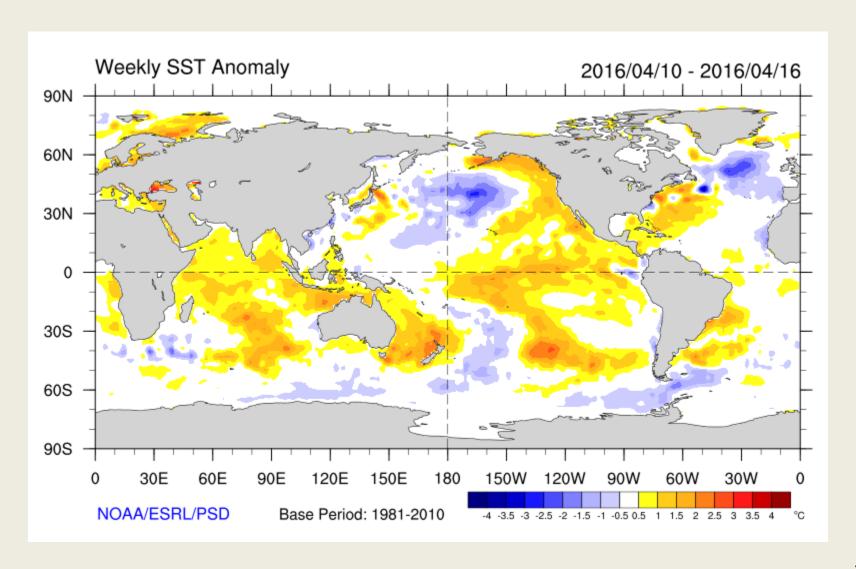
Credit: CPC

* 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





Niño Region SST Departures (°C) Recent Evolution



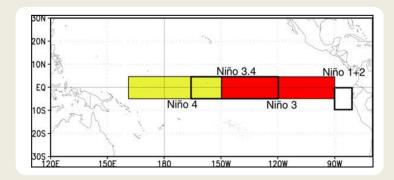
The latest weekly SST departures are:

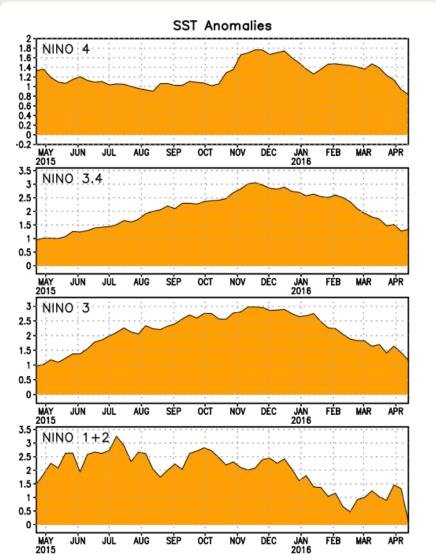
Niño 4	0.8°C
--------	-------

Niño 3.4 1.3°C

Niño 3 1.2°C

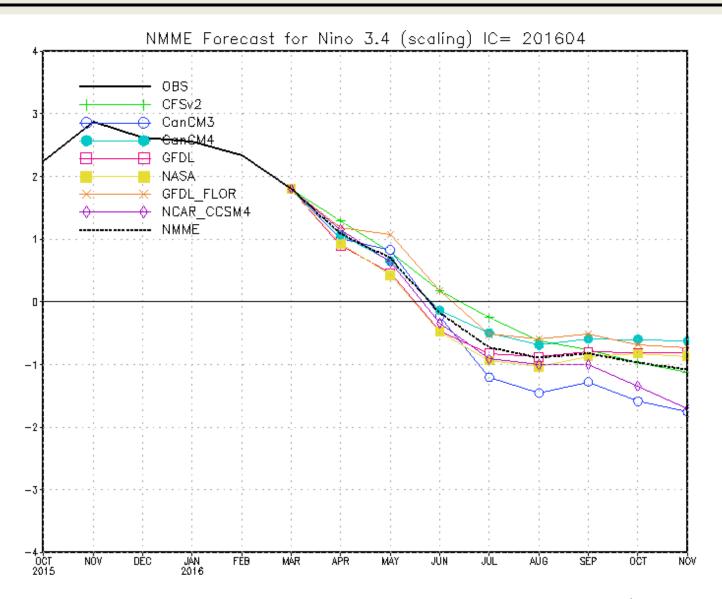
Niño 1+2 0.1°C





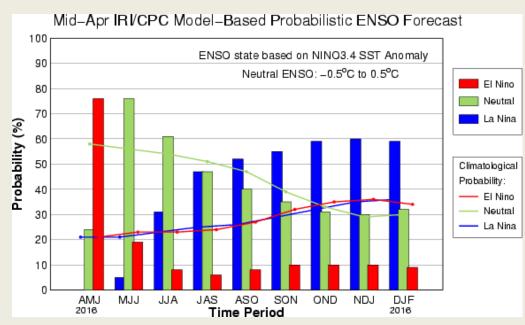
ENSO Forecasts





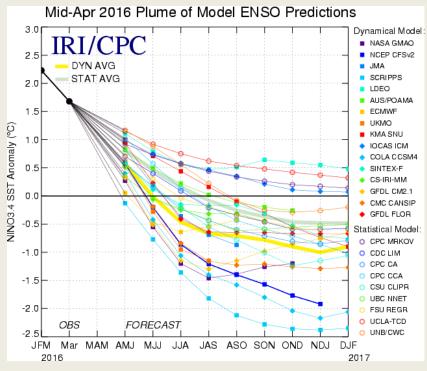
ENSO Forecasts





CPC/IRI El Nino forecast:

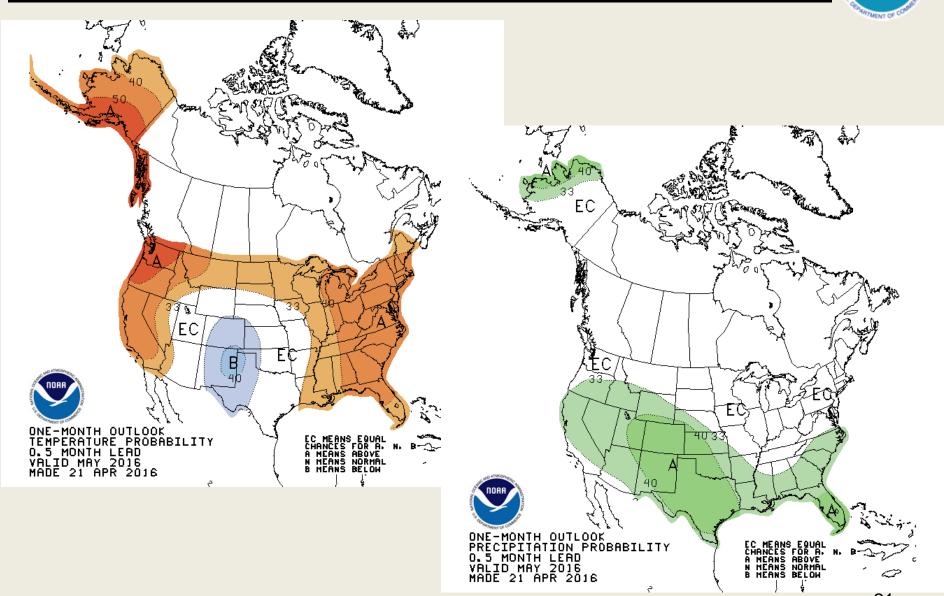
NMME models + other dynamical models + statistical models



Source: CPC/IRI

May U.S. Forecasts



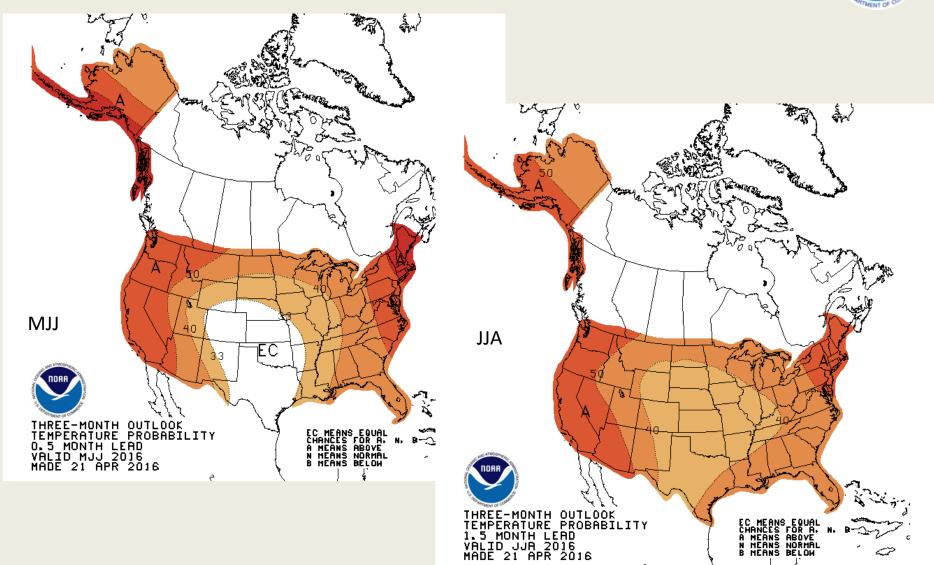


Source: NOAA/CPC

21

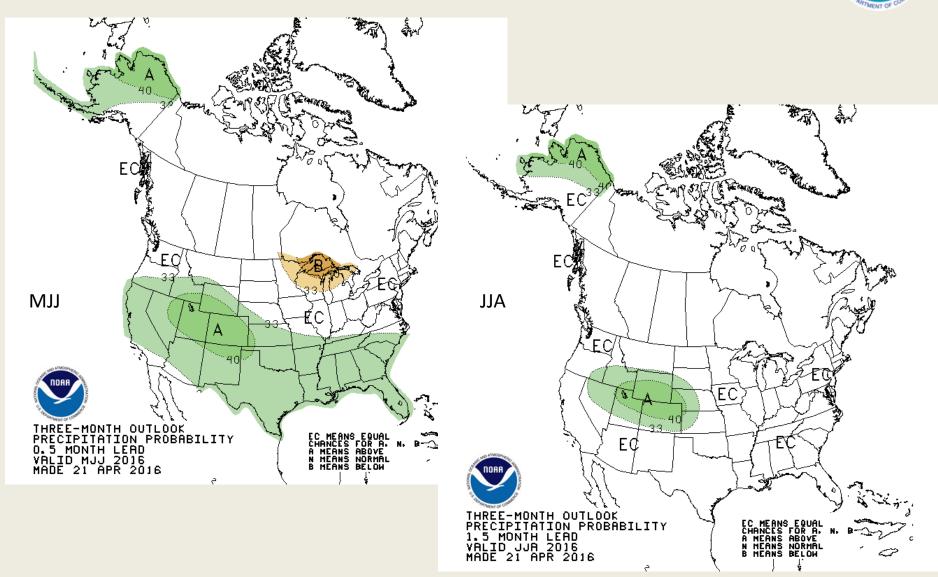
U.S. Temperature Forecasts





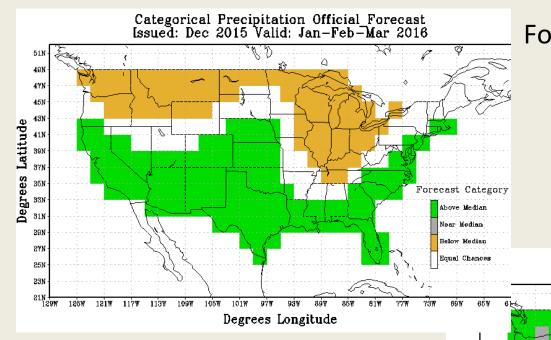
U.S. Precipitation Forecasts





CPC JFM Precipitation Forecast Verification





Forecast

Observations

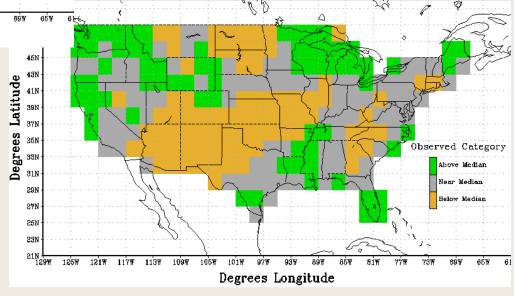
Categorical Precipitation Observations Valid: Jan-Feb-Mar 2016

Heidke Skill Score (HSS) = -12.93

Max = 100 (perfect forecast)

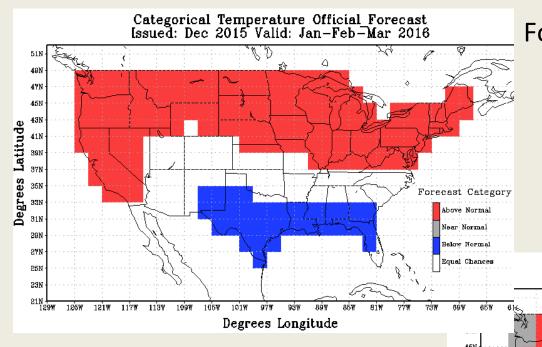
Min = -50

Positive HSS = skillful forecast Negative HSS = no skill in forecast



CPC JFM Temperature Forecast Verification





Forecast

Observations

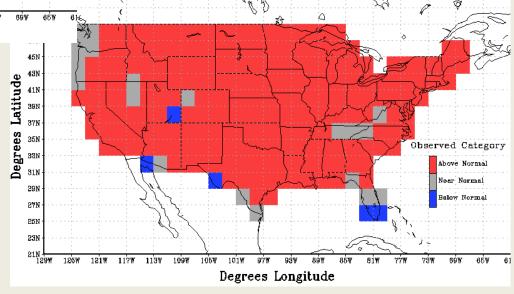
Categorical Temperature Observations Valid: Jan-Feb-Mar 2016

Heidke Skill Score (HSS) = 46.12

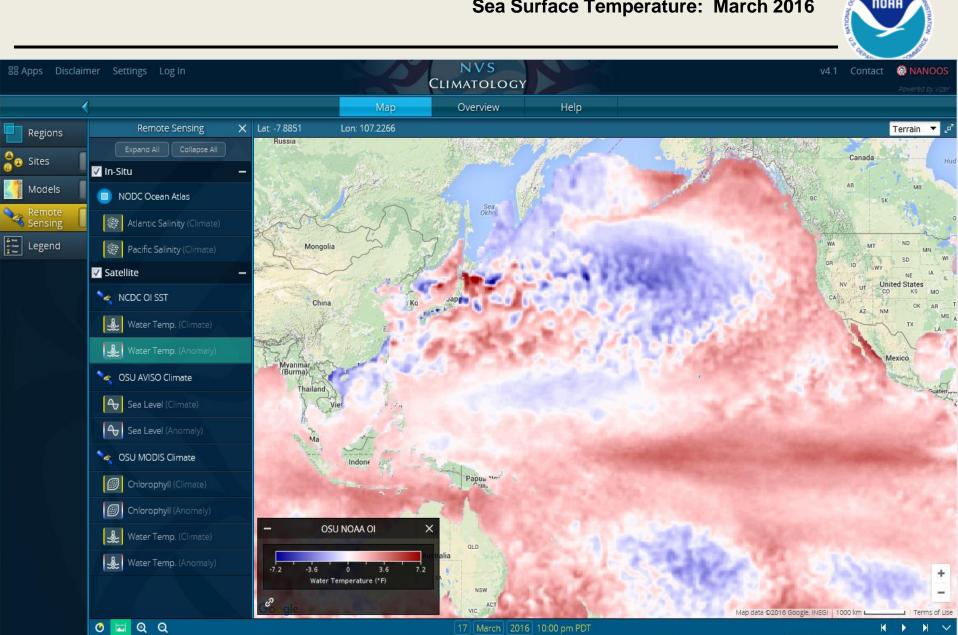
Max = 100 (perfect forecast)

Min = -50

Positive HSS = skillful forecast Negative HSS = no skill in forecast

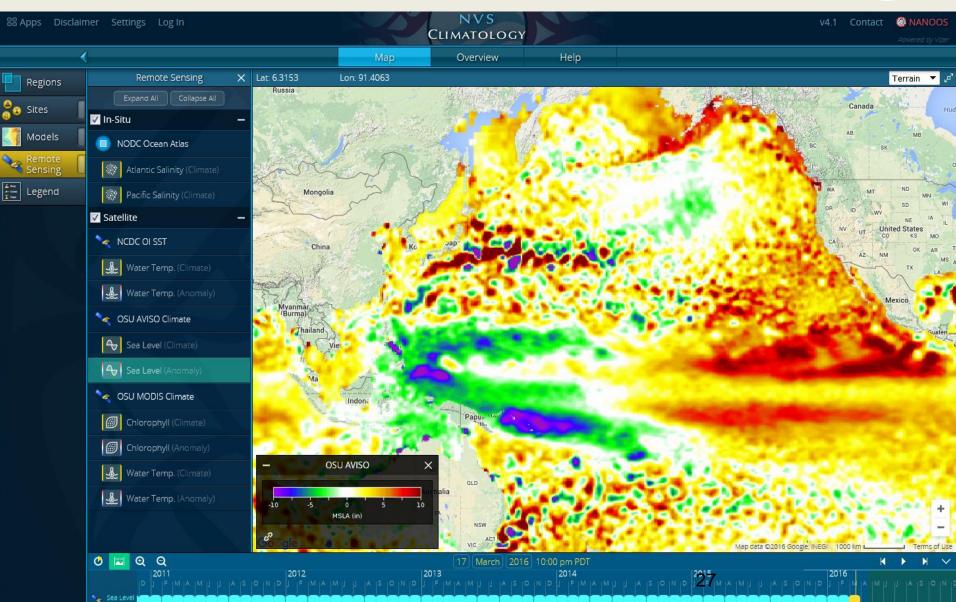


Sea Surface Temperature: March 2016

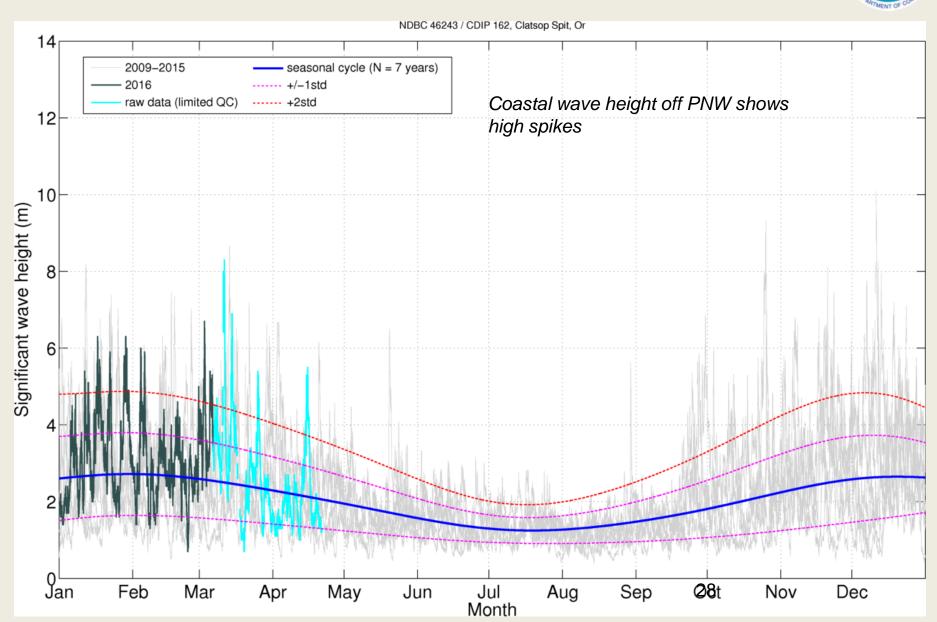


Mean Sea Level: March 2016

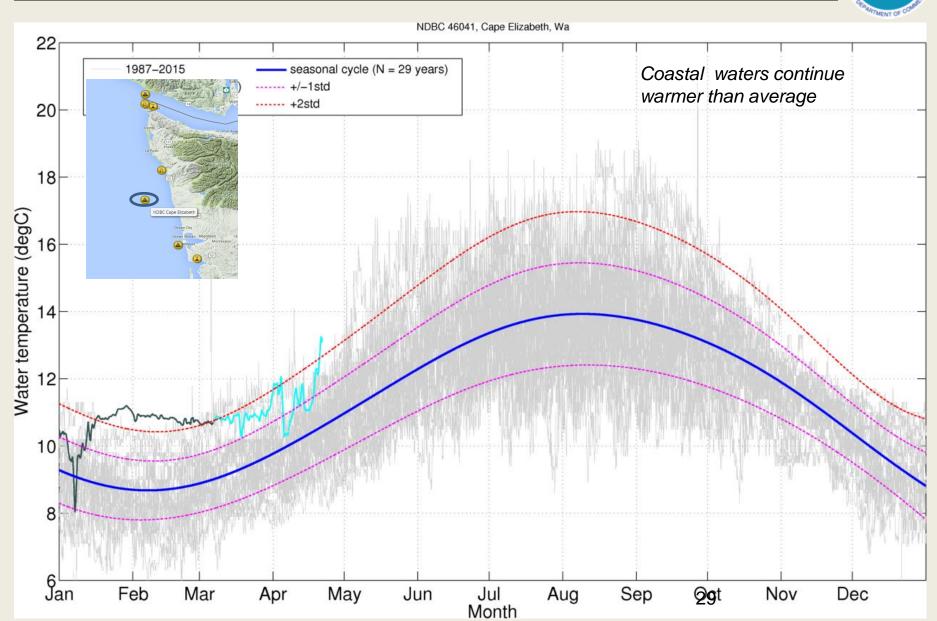


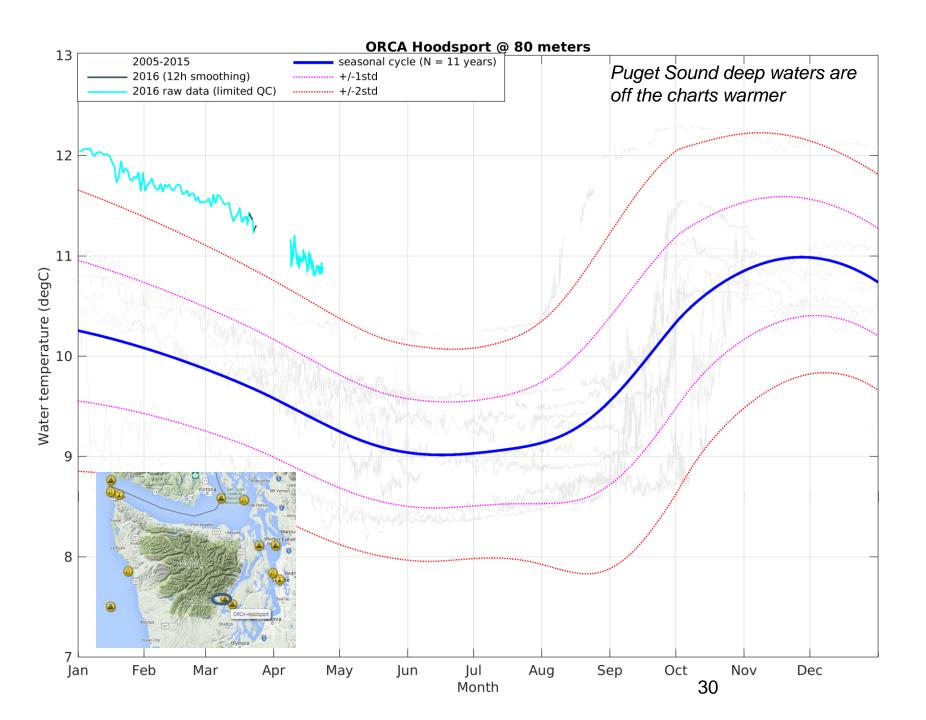


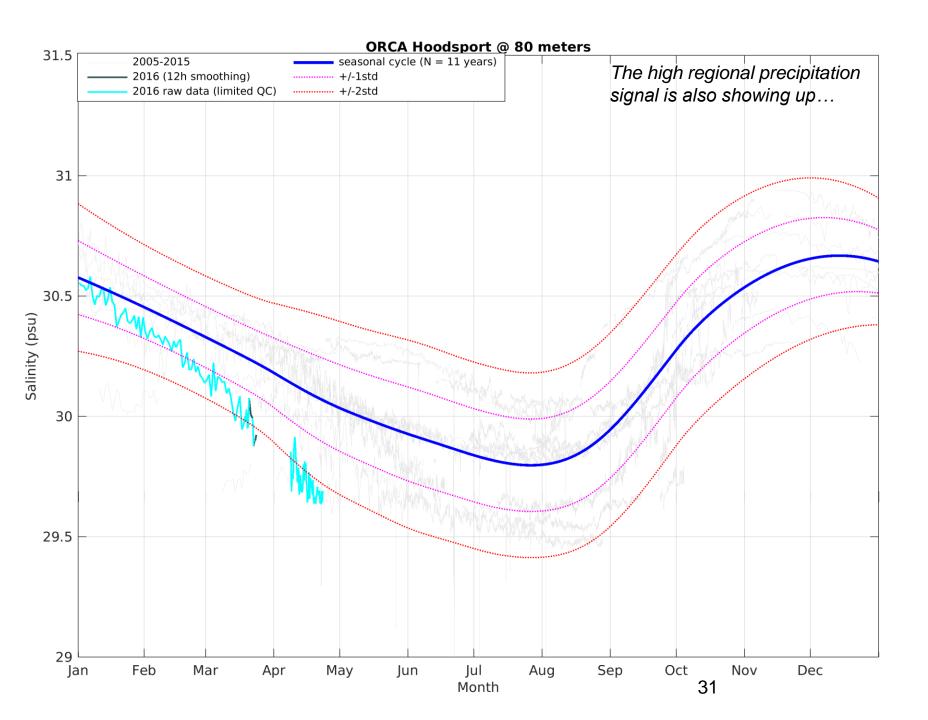


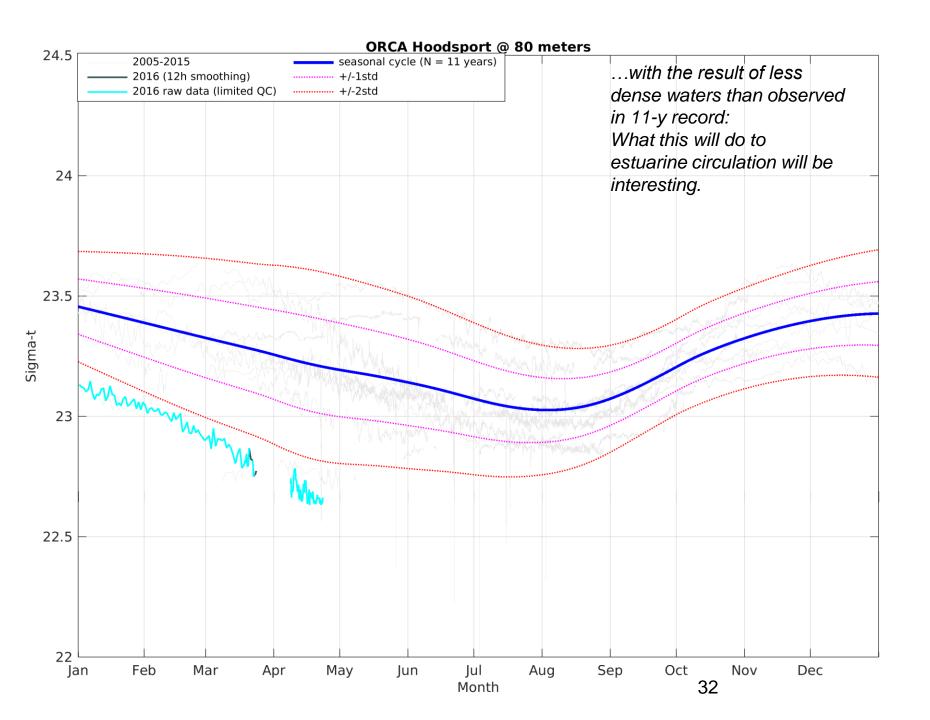




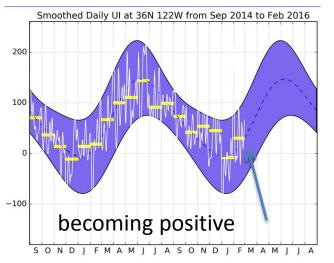








Observing the Spring Transition in the California Current Using data from the Central and Northern California Ocean Observing System





Spring Tr	ansition
Lat °N	Index
48	119 ± 29
45	114 ± 26
42	82 ± 29
39	50 ± 34
36	30 ± 28
33	6 ± 7

Average is April..







'The spring transition marks the beginning of the upwelling season and can occur at any time between March and June. Generally, the earlier in the year that upwelling is initiated, the greater ecosystem productivity will be in that year. In some years the transition is sharp, and the actual day of transition can be identified easily, but in many years transition timing is more obscure. It is not uncommon for northerly winds (favorable to upwelling) to blow for a few days, only to be followed by southwesterly winds and storms.' -Steven Bograd, SWFSC

Regional Impacts Summary – 03/18 to 04/20



Reporting Status:

- 256 entries since July 1, 2015
- Last reporting period: 25 environmental conditions & regional impacts reported

Environmental Conditions Capture:

- "Warm Blob"/warm ocean temperature
- El Niño
- Drought
- Precipitation
- Heat wave
- Snowpack/snow melt

Human & Ecosystem Impacts:

- Prey availability
- Marine mammal strandings (seals & sea lions)
- Water releases/flood control
- Increased tensions around water use/allocation
 - ✓ Fisheries
 - ✓ Irrigation supplies
- Commercial fisheries
 - ✓ Salmon (restrictions/closures)
 - ✓ Sardine (closure)
 - ✓ Crab (limited opening)
- Species displacement: Mantis shrimp, red crab, seahorses, moon jellies, false killer whales

Headlines



Bureau increases water releases from Lake Shasta

Oroville Dam spillway gates open for first time in years

Sierra Nevada Snow Won't End California's Thirst

California Snowpack Nearly Average But Won't

Delta pumping to Southern California restricted despite rainy winter

Mountain Snowpack In Northwest Melting Fast This Spring

Crab fishermen prepare for Saturday's long overdue season opener

> 'Disastrous' Coho Returns Threaten Western Washington Tribes

California salmon season cuts planned to protect struggling fish

California drought: Water allocation has winners, losers

End Drought

Crab fishermen wait to hear if season can start in earnest

It's official: West Coast sardine fishery shutdown continues for 2nd year

Red crabs, seahorses, moon jellies and more: The ocean is giving us 'gifts of El Niño'

False killer whales spotted in feeding frenzy off Dana Point Coast – rare for this area

Low Salmon Projections 'Punch In The Face' For Fishermen

Marin's Marine Mammal Center coping with relentness influx of ailing sea lions

Impacts in Pictures





March, 24. People watch as the Oroville Dam controlled spillway flows with water for the first time in 5 years to maintain storage space in Lake Oroville for flood control. ChicoER News.

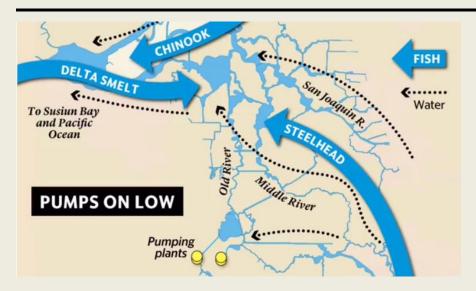




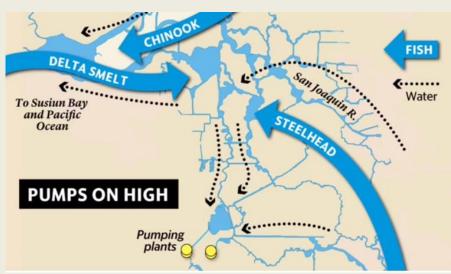
April 11: Snow partially covered the Sierra Nevada in central California. Officials said that the pack peaked two weeks ago at 87 percent of the long-term average. Credit Henry Fountain/The New York Times.

Impacts in Pictures











Impacts in Pictures





March, 23. After a 5 month delay the commercial crab fishery opened south of Sonoma-Mendocino county line.



April 20: Laguna Beach Pacific Marine Mammal Center. Sick and malnourashed sea lions are arriving older and later in the season due to disappearing cold water food sources.



April 14. Commercial salmon out of San Francisco will be limited.



April 18: False killer whales off Dana Point, CA.

Telling Regional Stories – NOAA West Watch #2



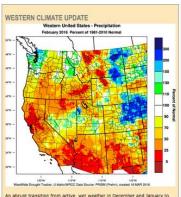
NOAA-West Watch

Second issue

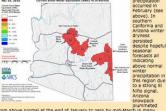
This is the second edition of NOAA-West Watch, a periodic collection of stories documenting how environmental change is affecting people and places in the western United States. If you have a story suggestion, please contact Michael Mistein (michael mistein@noaa.gov) or Tirri Vann (timi.vann@noaa.gov).

n this issue

- Western Climate Update
- El Niño storms boost California ski areas
- Record waves batter West Coast shorelines
 Rough conditions slow Columbia ship traffic
- Distant algae bloom drives up salmon prices



As about transition from active, we weather in December and January to mild and day in Peruany was found over much of the western Linets set. This change was most dramatic over central and northern California, the northern Great Basin, and parts of the northern Rockies where less than contem Care and the contemporary of the



from above normal at the end of January to zero by mid-Marian in many joint outsides. At the Promotory Arthora SNOTE is set of an election of the Promotory Arthora SNOTE is set of an election of the promotory Arthora SNOTE is set of the promotory Arthora SNOTE is set of the promotory of the pro

The state of the s

El Niño storms boost California ski areas

Western ski areas are cheering the best ski season they have recorded in three to four years, with crowde and you boosted by the buzz of EI Ninh-Gueled anneyads, and subsequently by some of the greatest snowfall statis for this point in the season in several years. California's Mammedh Mountain recorded more than eight feel of snow in less than a vestil in early March, and has already attracted more skines than it did in all of last ascass. Skilling is expected to slat in the bullet or even July.

The nine largest ski resorts in the Lake Tahoe area contribute \$504 million to the economy in a good year, according to a 2014 assessment, and California ski areas together generate more than \$1.0 billion in economic activity each year, a statewide assessment found. A good snow year boosts California ski area business by more than \$100 million, occording to a 2012 study.



Heavy snow falls at Mount Rose, at 8,260 feet near Lake Tahoe. Photo courtery Mount Rose Ski Tahoe.

areas is the level of the snow line - the elevation of freezing which appears to have gradually shifted uphill during many recen winters, said John Gifford, president of the Pacific Northwest Ski Areas Association. "Freezing levels are definitely higher than they used to be," he said. "For sk areas and the lower the snow leve the better," said president of the

California Ski

Industry Association. Higher elevation resorts such as Mourti Bachbor in Cregon, Mount Reso in the Lake Alboa area and mountain resorts in Clorade have had some of the most reliable snow because they experience cold temperatures more frequently. Many resorts at lower develorison have agreesively diversified their increastional offerings and invested in sophisticated snowmaking so they are less dependent on snowfall to attract visitors throughout the writter, six industry officials sold.

Decomber snowfall stanted out very storing with a series of strong wither storms and very to series read with the standard stream storing to series read in an expenditure of the confirmed in almost principly with slightly warmer temperatures. Fethurary was unseasonably warm and dry in California but above that services above and April hybically are some of the biggest snow that the confirmed in the standard programmer and April hybically are some of the biggest snow that the confirmed in the standard stream standard programmer and April hybridge with all the standard programmers. For some reactics spring temperatures will determine how long the season task, while other soll look to stay poper wall that spring.

Record waves batter West Coast shorelines

Some of the largest waves recorded on the West Coast have battered and flooded shortlines, Including some populated areas and honors, and ended beaches in the last few months. The waves are riding on elevated sea levels that remnant heat from the "warm bibl" comined with El Wist Compensations already pushed roughly a third to a half-floot higher than usual, with the <u>sea level increase especially prenounced of</u> <u>Cultifornia</u>.

That has translated into approximately 45 percent more wave energy than normal half. West Coast beaches, with about 40 percent more ensoin than the average for the similar winter time frame, said Patrick Barmart, a. U.S. Geological Survey researcher virtucks ensoin on the West Coast. Everything is in line with what we expect during strong El Nifo conditions like we're experiencing," he said. In a few anecdotal cases a few beaches have largely been sweet clean of much of their sand.

Barnard is leading an interagency effort to survey the oritire Pacific Coast from the Moxican border north to Canada with Lidar, a precision mapping system that uses airhome leasers to very accurately measure elevations. NOAA, USGS and the U.S. Army Corps of Engineers are helping to fund the effort. The goal is to document the



High waves at La Jolla Shores, Calif., March 8, 2016 Photo courtesy Randy Bucciarelli

topography of West
Coast beaches when they are at or near minimum levels because of El Niño-driven
erosion, so scientists can then track subsequent changes.

In February WDA's National Geodetic Survey dealerses in SDAA alread to collect more being 1,000 good conferenced actions in reages of the Weed Coast from the Mexican bender to Gape Flattery, Wesh. The imagery will help assess impacts of El Niko through comparison with anoife baseline images collected in Geopheriche 2015. Gibling imagery provides views of a wider areas and improves the visibility of vertical structures, such as the sides of buildings. The oblique imagery is publicly available ordine, and will support assessments and discission by MCAA agencies and mission partners such as the U.S. Agency and other states, local and accessor interests.

Weblink:

http://campaign.r20.constantcontact.com/render?m=1113800373 012&ca=8b476ef2-9b94-4107-98de-437421865cd2

Rough conditions slow Columbia ship traffic

Strong December storms powered by El Niño repeatedly shut down commercial shipping traffic into and out of the Columbia River west of Portland, according to the pilots that guide ships across the treacherous Columbia River Bar where the river meets the sea near Astoria, Oregon.

The frequency of the fronts brough December was neally semething," said Dan Jostan of the <u>Calumba Royer flar Plate</u> is and a pick inhered. "They just kept coming day after day. It seemed like every other day will have to suspend service because the bar was so rough." He said the picks suspended shipping traffic across the Calumbia Rover Bar nearly 10 issues in the month of December, among the most closurer in a single moth ready to the pick in the pick is superiod and the pick in the pick in the pick is the pick in the pick in

According to the Merchants Exchange of Portland, the bar has been closed 15 times so far this winter, compared to nine closures in the winter of 2014-15, nine in 2013-14, six in 2012-2013 and 14 times in 2011-12.



A cargo ship crosses the Columbia River Bar in hig Photo courtesy Columbia River Bar Pilots

crossing into or out of the Columbia River must be guided between the open sea and Astoria by a Columbia River Bar pilot. and pilots may suspend service when conditions become too rough for a safe transit across the Columbia Bar. At times when the weather forced closures in Bodding pattern offshore while they waited for a pilot to guide waited for a pilot to guide waited for a pilot to guide waited for a pilot to guide

them inland, Jordan said. About \$24 billion worth of cargo transits the Columbia each year, and past estimates have put the cost of river closures at about \$10 million for three days.

Ships traveling down the new from Portland may take close to eight hours to reach Alestina, and conditions on the bar can change so quickly that bar pilots sometimes have to close the bar while the ships are still in turnet. Justina said the pilots often consult with National Weather Service forcessiters and use NOAN's online weather, real-time busy data and other foresaling resources to advise departing injust whether they should that the rip downriver or hold back in Portland if threatening conditions are likely to close the bar before they can cover the distance to the river modil.

Distant algae bloom drives up U.S. salmon prices

A long-distance impact of the unusually warm ocean conditions associated with El Nino is driving up salmon prices in the United States.

El NÑo warrith has fueled an especially severe algae bloom that is weaking have on authorn farms in Chik, Billing more than 27 million fish at an estimated cost of close to \$500 million and putting pressure on salmon prices workfwide. A Nordic bank predicted to loses well lead to "jubbel supply treat" in salman, societing to Undercurrent News. Chile is by far the largest source of salmon inported to the Lindel Balace, accounting to more than a third OL S. almon insports worth more than 1° to Hillion last

Salmon farming officials in Chile estimate that the bloom will depress salmon production in Chile by 20 percent or more, depending on how long the algae bloom lasts. Seatlood wholesalers in the United States said prices for both farmed and wild salmon have rise as much as 20 percent in recent weeks as the impacts of the Chilean algae bloom became increasingly apparent.

Thanks for reading NOAA-West Watch

This is a project of NOAN: Western Regional Collaboration Team (NOAN West) with contributions from many regional partners. The 10-month project will document changing environmental conditions in the Western U.S. and how they are affecting the public and NOAN mission. We invite suggestions and contributions. These reports will be consolidated into a season-end warpu. For submissions, usedisons or comments, please contact Michael Mission at michael milistein@noas.gov or Timi Vann at timi vann@noas.gov.

Western Climate Update graphics provided by West Wide Drought Tracker, North American Preezing Level Tracker and NRCS Snow Telemetry and Snow Course Data and Products.

Announcements & Open Discussion



- Next WRECIC call: Wed May 25, 2016 (moved up due to Memorial Day)
 - ✓ Likely to be our last call
- Project phase out:
 - ✓ Participant Survey please help!
 - ✓ Results presented on next call with discussion of possible next steps
 - ✓ Short pub
- Open Discussion or Parting Comments

https://www.surveymonkey.com/r/78DZ62Z

wester	n Region Environmental Conditions & Impacts Coordination (WRECIC) Project Survey
to inform Niño) an project w this type	tern Region Environmental Conditions and Impacts Coordination (WRECIC) effort is a short-term project designer ally collect and share information on regional environmental conditions (especially departures from normal, and El I how people, places and NOAA mission interests within the region are experiencing environmental change. The as initiated in August 2015 and is scheduled to conclude in May 2016. As we consider if, when, and how to sustato from the coordination in the future, we would like to ask you a few questions about this project in ordunderstand what aspects of the project were most helpful to you.
Thank yo	u in advance for your time and input. Results will be presented and discussed on our final webinar (May 2016).
_	nany monthly WRECIC webinars did you attend?
<u> </u>	,,
O 4-6	
7-9	
2. What	aspects of the WRECIC webinars are most important to you? (1 most important; 4 least important)
::	
:: (\$ Special Highlights (e.g., State of the California Current; Wildfire Outlook)
**	Open Discussion
:: (Regional Impacts Summary
3. Do yo	u have any comments you would like to add about the monthly webinars?
3. Do yo	u have any comments you would like to add about the monthly webinars?
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4. If the Only	WRECIC webinars were to be continued in the future, how often should they be held?
4. If the Only	WRECIC webinars were to be continued in the future, how often should they be held? when there is an El Nino or La Nina Advisory
4. If the Only Once Once	WRECIC webinars were to be continued in the future, how often should they be held? when there is an El Nino or La Nina Advisory a month