NWS – CNRFC Update
&
WY 2020 Winter Outlook

Alan Haynes
Hydrologist-In-Charge
CNRFC UPDATE
WY2020 New Developments

• Move to Baseline
  – Lost Hardware
  – Security requirements

• Baseline Forcings
  – QPE
    • MPE - DailyQC
    • MRMS
  – QPF – NBM

• NWC Backup
WY2020 New Developments

- Flood Forecast Points
  - Hopland
    - FS lowered to 15 ft

- River Forecast Points
  - Russian River
  - 7 new basins

Total = 346 forecast locations
WY2020 New Developments

• Reservoirs
  - Trinity Lake
  - Los Banos Reservoir
  - Merced Group

• San Joaquin
  – Recalibrations
  – Vernalis Ensembles

• DWR Reservoirs
  – Feather Basin
WY2020 New Developments

• San Joaquin Recalibrations
  – Hidden (Hensley Lake, Fresno River)
  – Buchanan (Eastman Lake/Chowchilla River)
  – Merced Group streams (5 pnts > Bear Ck at Mckee Rd)
  – Orestimba Ck
  – Del Puerto Ck
  – Dry Creek - Snelling
  – Vernalis

• Select areas of:
  – Feather Basin, American, Central Coast, SoCal
WY2020 New Basins

Total = 355 forecast locations (100 official)
Full CNRFC Staffing (14)

- Hydrologist-In-Charge
- Development and Operations Hydrologist
- Service Coordination Hydrologist
- +8 Engineer/Hydrologists
- 3 Meteorologists
- Administrative Assistant
- Information Technology Officer (ITO)
- 6 Hydrologists
CNRFC STAFFING

3 New Hires in WY 2019

- Senior Hydrologist (10/18)
- Hydrologist (2/19)
- Information Technology Officer (8/19)

- One position still vacant (Hydrologist)
Full CNRFC Staffing (14)

- Hydrologist-In-Charge
- Development and Operations Hydrologist
- Service Coordination Hydrologist
- Administrative Assistant
- Information Technology Officer (ITO) (New in August)
- +8 Engineer/Hydrologists
- 6 Hydrologists
- 2 New Hydrologists In WY 2019
- 3 Meteorologists
- 2 New Hydrologists In WY 2019
- 6 Hydrologists
Operational Forecast Schedule

Winter (Wet) Operations

• Two Forecasts/day (0900 and 1500)
• Weekends: only 0900 forecast

Summer (Dry) Operations

• One Forecast/day (0900 each day)

Flood Operations

• 4 Forecasts/day
Routine Hydro Operations

A Typical Day (6:00 a.m. – 2:00 p.m.)

6:00 – 7:30 a.m.  ➡️ Daily QC of Precipitation
                ➡️ Analyze Hydromet Situation
                ➡️ Reservoir Releases

7:30 – 9:00 a.m. ➡️ Run Hydro Models
                  ➡️ Issue Forecasts

9:00 a.m. –      ➡️ Update Model States
                  ➡️ Development Work

10:00 – 10:30 a.m. ➡️ Operations Briefing
National Water Model (NWM)

- Full spectrum hydrologic model, providing complementary hydrologic guidance
- NWM was upgraded to V2.0 in June 2019 by OWP, NCEP and NCAR
- Hydrologic core is WRF-Hydro, a community-based hydrologic modeling framework

RFC AHPS

River Forecast Centers: Authoritative forecasts at ~3,600 RFC Points

NWM: Guidance at 2.7 million NHDPlus river segments, filling in coverage gaps and enriching existing points
Questions ????
2020 Winter Outlook
Jet Stream & Storm Track by ENSO Phase
El Niño or La Niña

Key Differences:

Jet Stream changes

Storm Track Location

Variability
CA Statewide October-March Precipitation
(versus Southern Oscillation Index for prior year June-November)

Years 1933/1934 - 2017/2018
$r^2 = 0.08$
Correlation = -0.29

Mean = 21.31 in
Mean all = 18.73 in
Mean = 18.61 in
Mean = 16.85 in

Western Regional Climate Center
CA Statewide October-March Precipitation
(versus Southern Oscillation Index for prior year June-November)

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El Niño
Neither
La Niña

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Western Regional Climate Center
The latest weekly SST departures are:

- Nino 4: 0.9°C
- Nino 3.4: 0.4°C
- Nino 3: -0.1°C
- Nino 1+2: -1.0°C
El Niño Predictions

Model Predictions of ENSO from Sep 2019

Dynamical Models
- NASA GMAO
- NCEP CFSv2
- JMA
- BCC_CSM1.1m
- SAUDI-CAU
- LDEO
- AUS/ACCESS
- ECMWF
- UKMO
- KMA, SNU
- IOCAS ICM
- CGLA CCSM4
- MetFRANCE
- SINTEX-F
- CS-IRI-MM
- GFDL CM2.1
- CMC CANSIP
- GFDL FLOR

Statistical Models
- NTU CODA
- BCC_RZOM
- CPC MKKDV
- CPC CA
- CSU CLIPR
- IAP-NIN
- UBC NNET
- FSU REGR
- UCLA-TCD

IRI/CPC
El Niño Predictions

Model Predictions of ENSO from Sep 2019

- Strong El Niño
- Moderate El Niño
- Weak El Niño
- Weak La Nina
- Moderate La Nina
- Strong La Nina

NOAA
Department of Commerce
El Niño Predictions

Early-October 2019 CPC/IRI Official Probabilistic ENSO Forecasts

- ENSO state based on Niño3.4 SST Anomaly
- Neutral ENSO: −0.5 °C to 0.5 °C

Season:
- SON
- OND
- NDJ
- DJF
- JFM
- FMA
- MAM
- AMJ
- MJJ

Probability %: 0 to 100

Legend:
- Blue: La Niña Forecast Probability
- Light Gray: Neutral Forecast Probability
- Red: El Niño Forecast Probability
- Dark Gray: La Niña Climatology
- Dashed Dark Gray: Neutral Climatology
- Solid Dark Gray: El Niño Climatology
CPC Temperature Outlook: Dec - Feb
CPC Precipitation Outlook: Dec - Feb
Winter 2019-2020 Outlook
Summary

• ENSO-neutral conditions are present
• ENSO-neutral conditions are likely to persist this winter (85% chance) and continuing into spring (55-60% chance)
• Temperatures are likely to be above normal for mid-winter
• Precipitation is likely to be below normal for Northern CA for mid-winter
Winter 2019-2020 Outlook Summary

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- This winter could be wet, dry or near average
Winter 2019-2020 Outlook Summary

- ENSO-neutral conditions are present
- ENSO-neutral conditions are likely to persist this winter (85% chance) and continuing into spring (55-60% chance)
- Temperatures are likely to be above normal for mid-winter
- Precipitation is likely to be below normal for Northern CA for mid-winter
- Remember this winter could be wet, dry or near average
- This forecast can’t be wrong!
Extra Slides
La Niña Events
Mean = 52.7 in.

All El Niño Events
Mean = 53.4 in.

Strongest Events
Mean = 59.2 in.

October-March MEI vs Northern Sierra Precip (1950-2015)

Average all years

1997-'98
1982-'83
1997-'98
La Niña Events
Mean = 102%

Strongest Events
Mean = 120%

All El Niño Events
Mean = 107%

1982-'83
1997-'98

MEI vs. North Sierra April 1 Snowpack (1950-2015)

April 1 SWE (Percent of Average)

La Niña Events
Mean = 102%

All El Niño Events
Mean = 107%

Strongest Events
Mean = 120%

October to March MEI (Std. Departures)