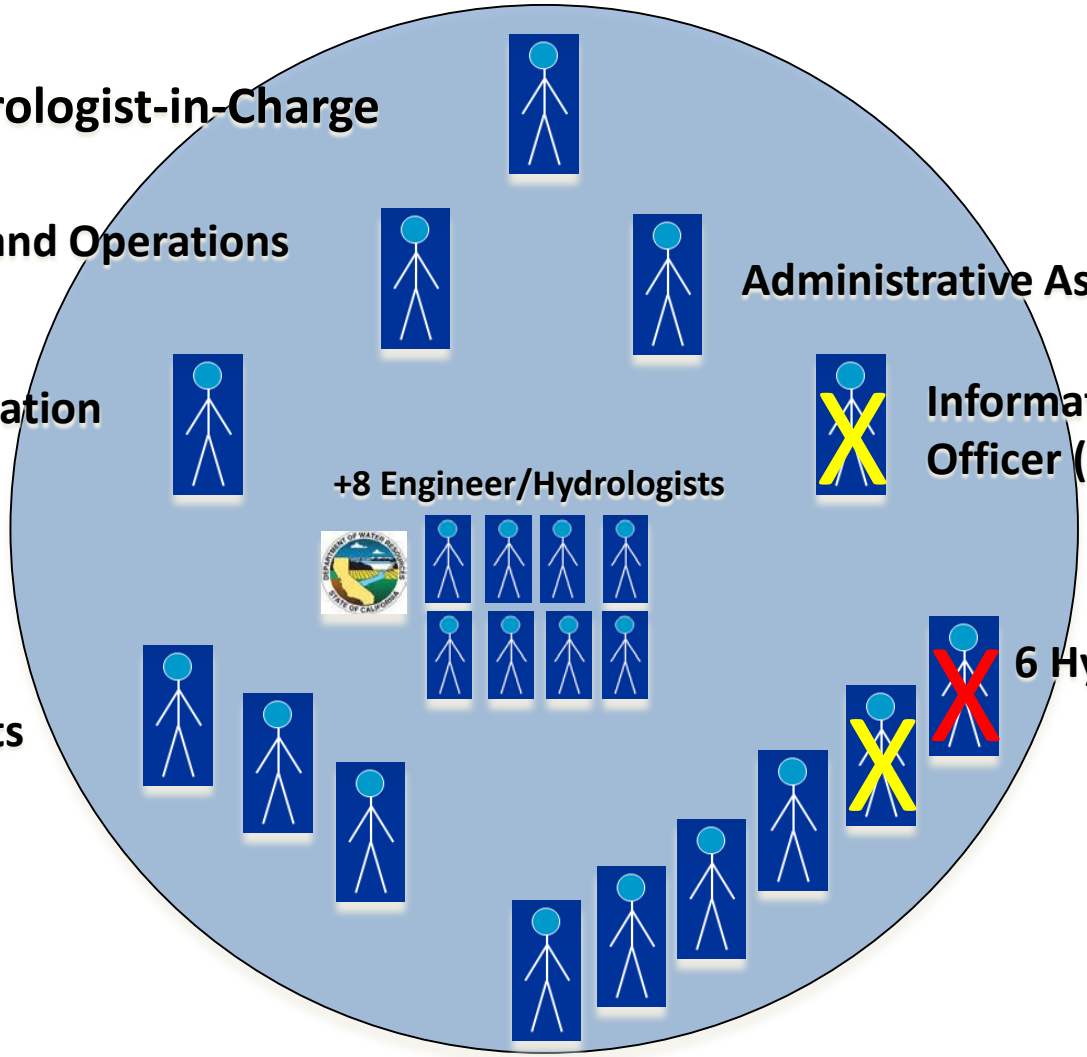
NWS – CNRFC Update

2018 COOP Meeting
Nov 14, 2018

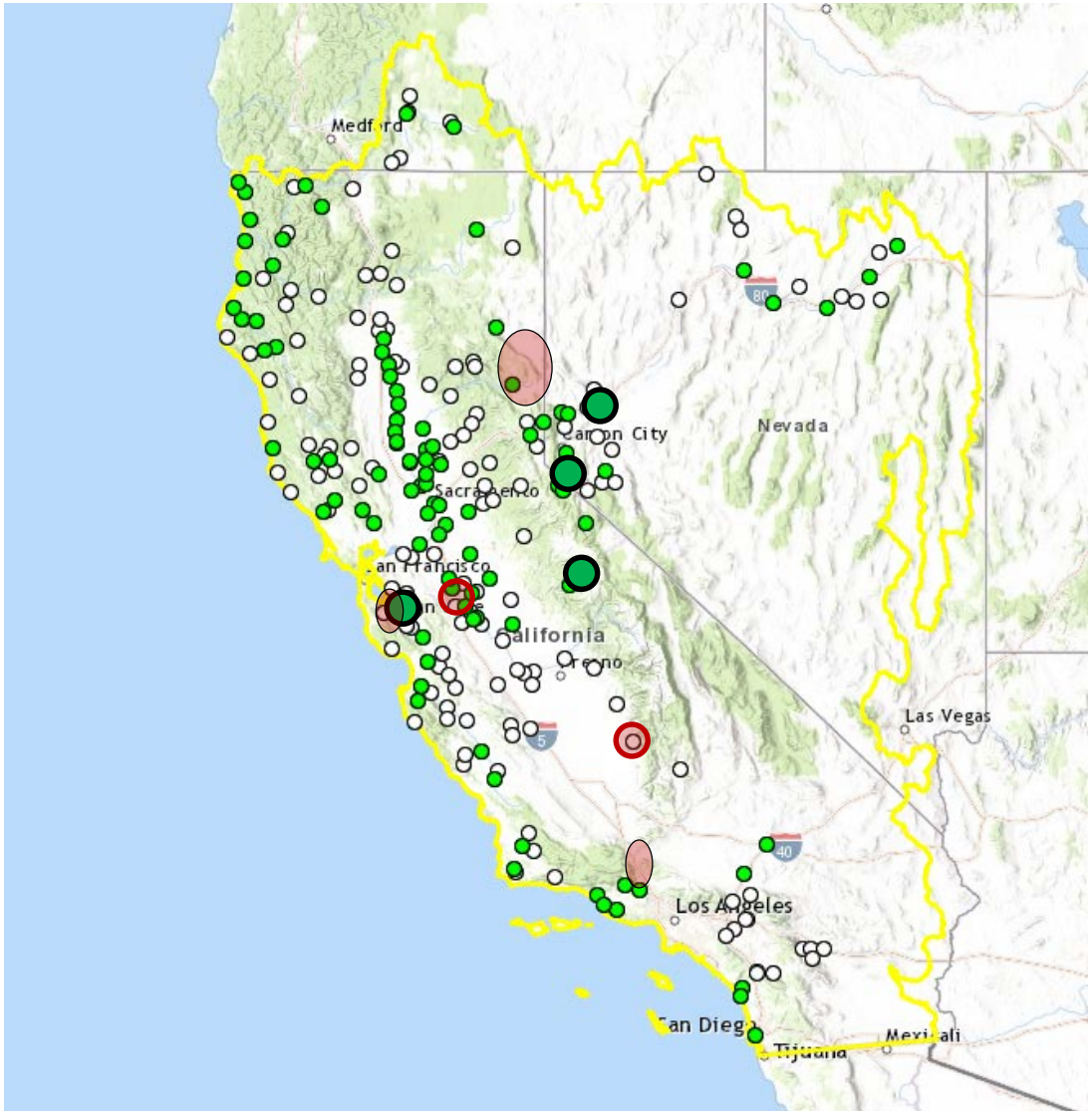
Pete Fickenscher
Service Coordination Hydrologist

2019 CNRFC Staffing (11-13)



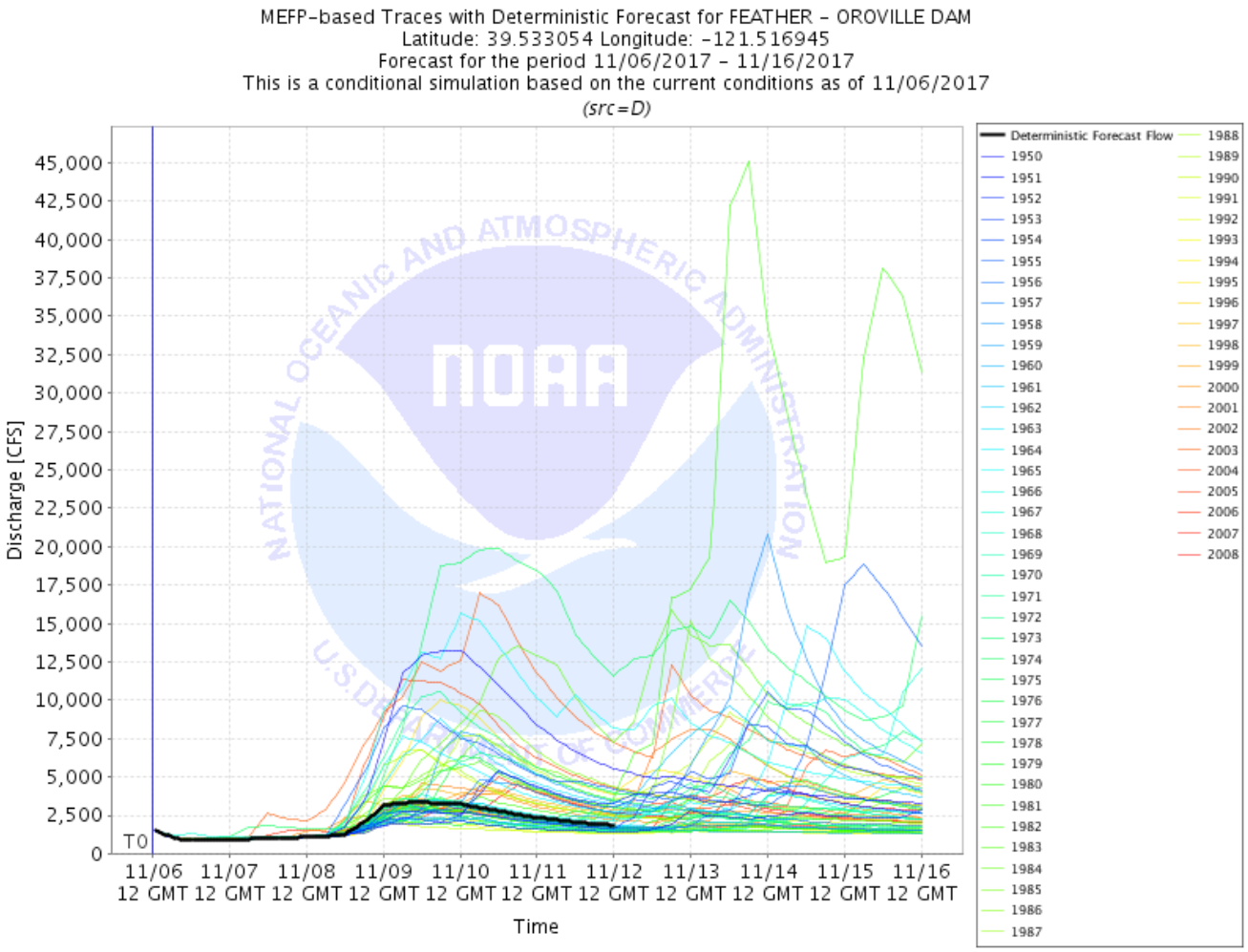
WY2019 New Developments

- New Forecast Points
- New Reservoir Inflow Models
- New Model Points



WY2019 New Developments

- Extend Ensemble Record to WY2017
- Add:
  - 2011 (snow)
  - 2013-2015 (drought)
  - 2017 (wet)

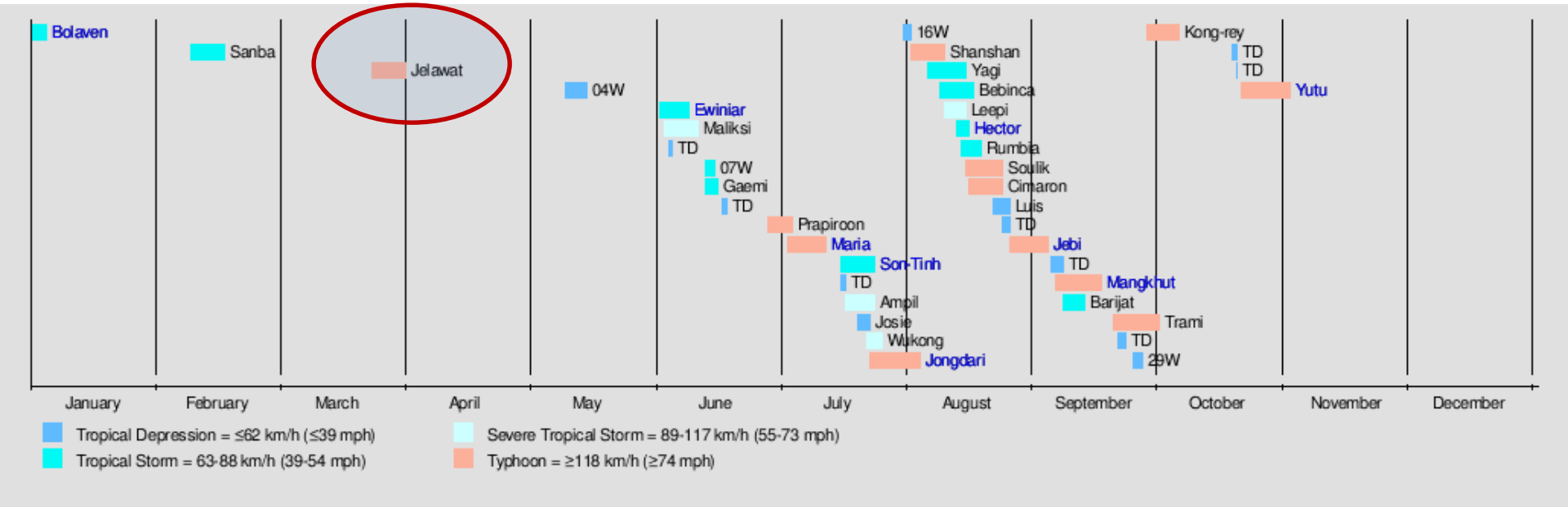


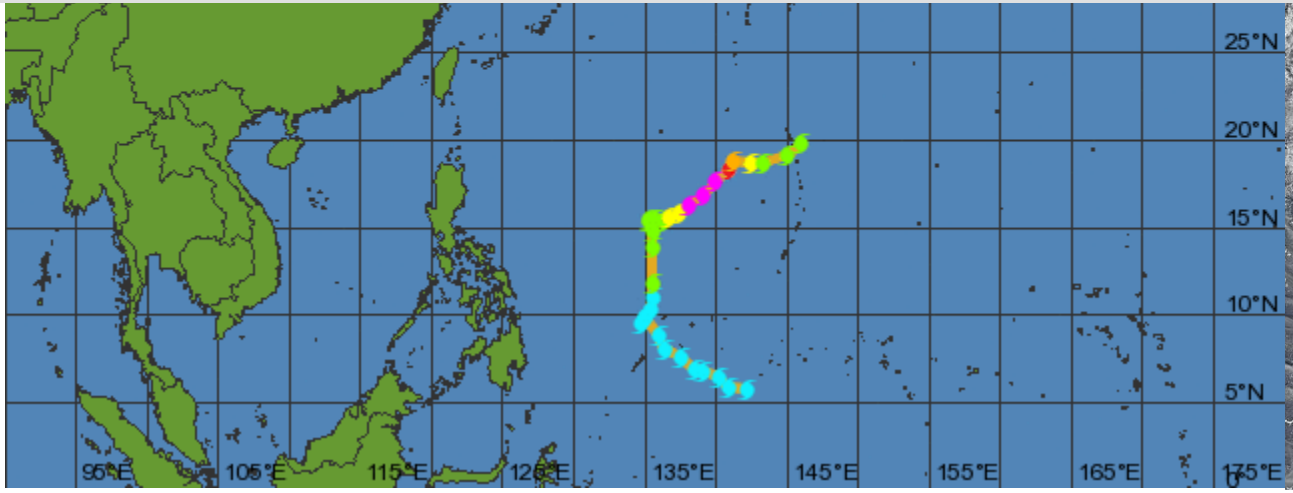
April 6-7 2018

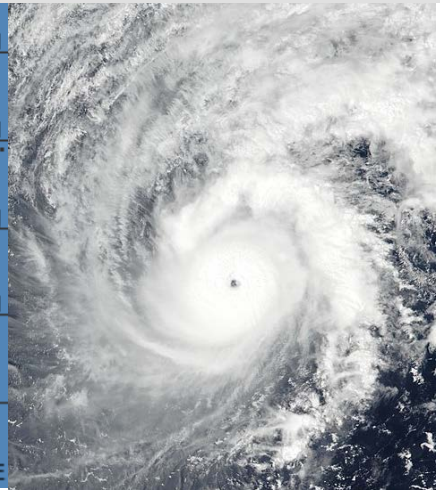
Rain-on-Snow

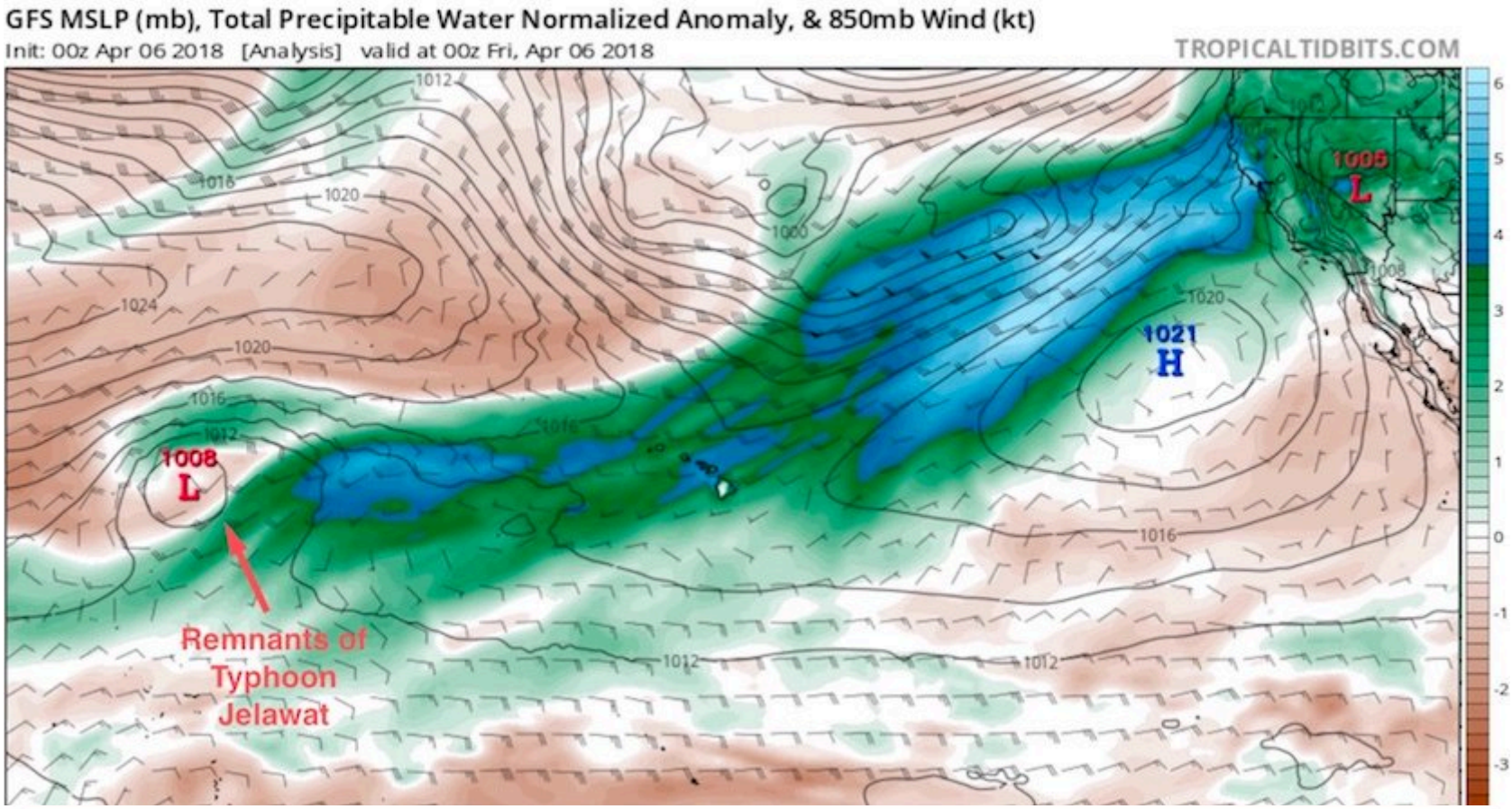
Merced River Case Study

Weather Background





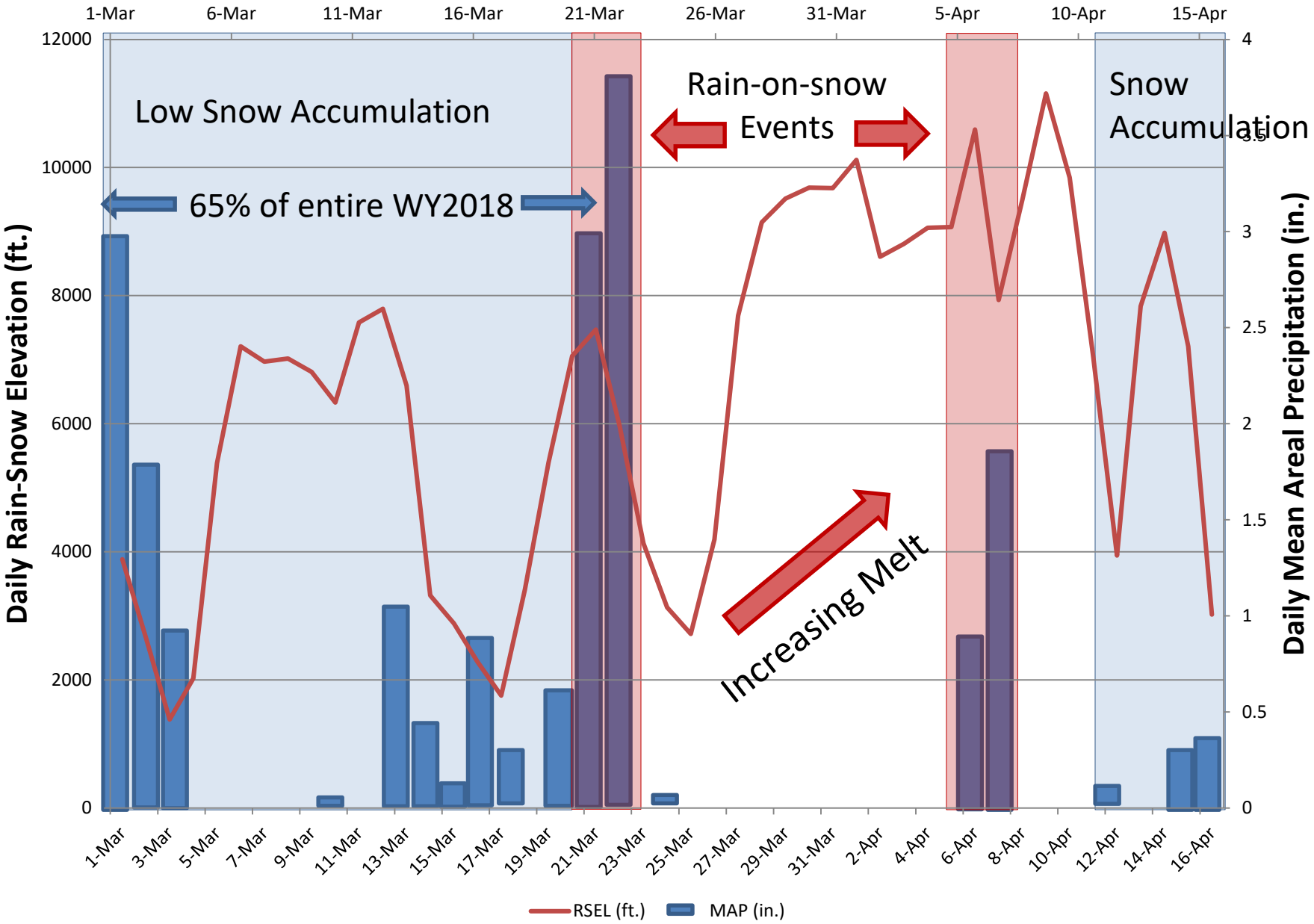




Upper-air measurement site	*Date*	*Precipitable water*	*Old record, Nov-Apr.*	*Old record, April*
OAK (Oakland, CA)	12Z Sat. 4/7	**1.72"** (4.38 cm)	1.53"	1.36"
NKX (San Diego, CA)	00Z Sun 4/8	**1.54"** (3.92 cm)	1.47"	1.28"
VEF (Las Vegas, NV)	00Z Sun 4/8	**1.12"** (2.85 cm)	0.94"	0.78"
REV (Reno, NV)	00Z Sat. 4/7	**0.91"** (2.30 cm)	0.84"	0.78"
LNK (Elko, NV)	12Z Sat 4/7	**0.87"** (2.22 cm)	0.72"	0.67"
GJT (Grand Junction, CO)	00Z Sun 4/8	**0.91"** (2.29 cm)	0.81"	0.81"

Source: Bob Henson, "Category 6" - 4/9/2018

San Joaquin Basin – WY2018

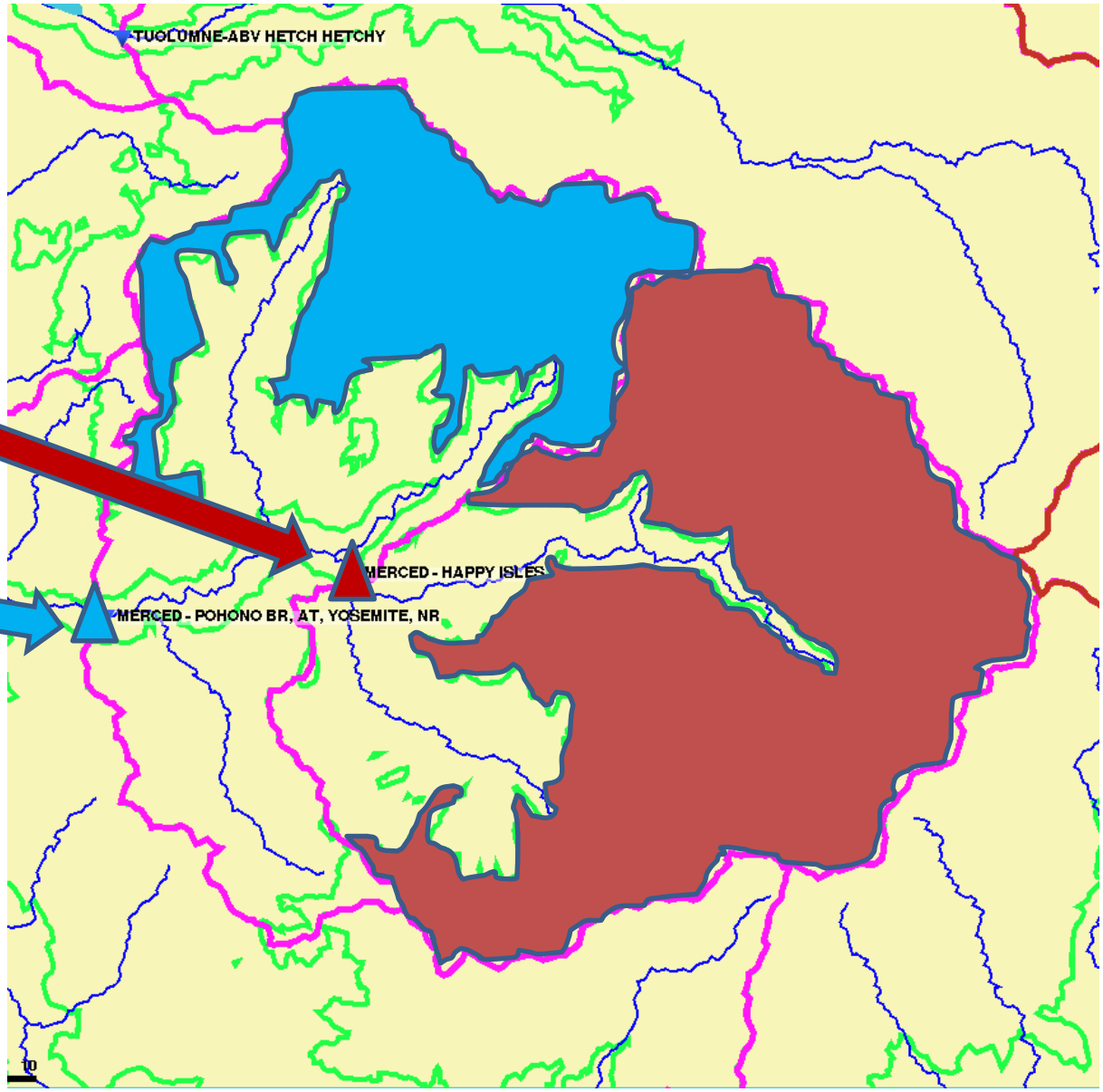


Basin Distinctives

Two Watersheds:

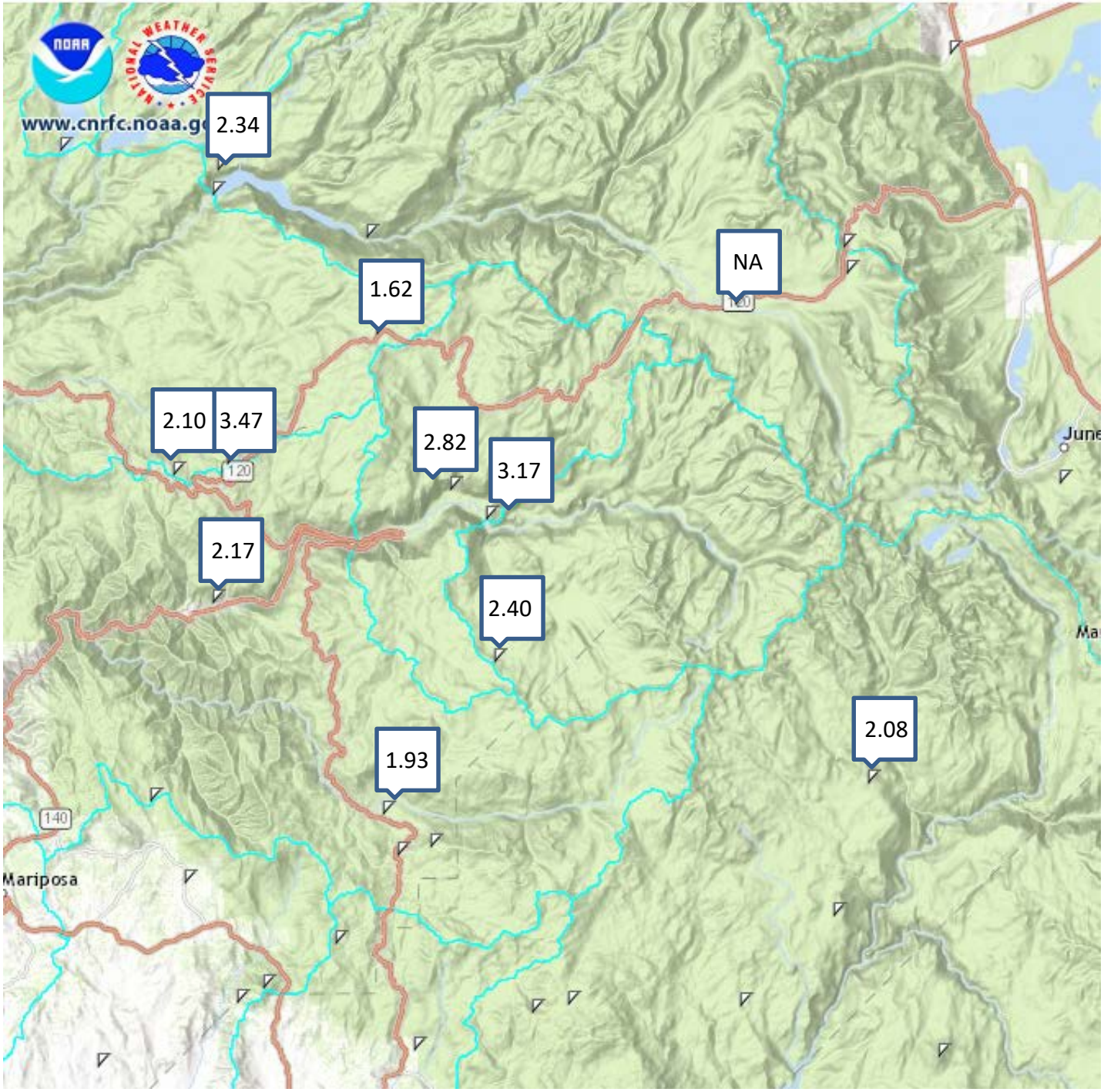
1. <u>Happy Isles (181 sq mi)</u>
   - 8000+ ft. = **132 sq. mi.**
   - Below 8000 = 49 sq. mi.

2. <u>Pohono Br. Local (140 sq mi)</u>
   - Downstream gage
   - 8000+ ft = **69 sq. mi.**
   - Below 8000 = 71 sq. mi.



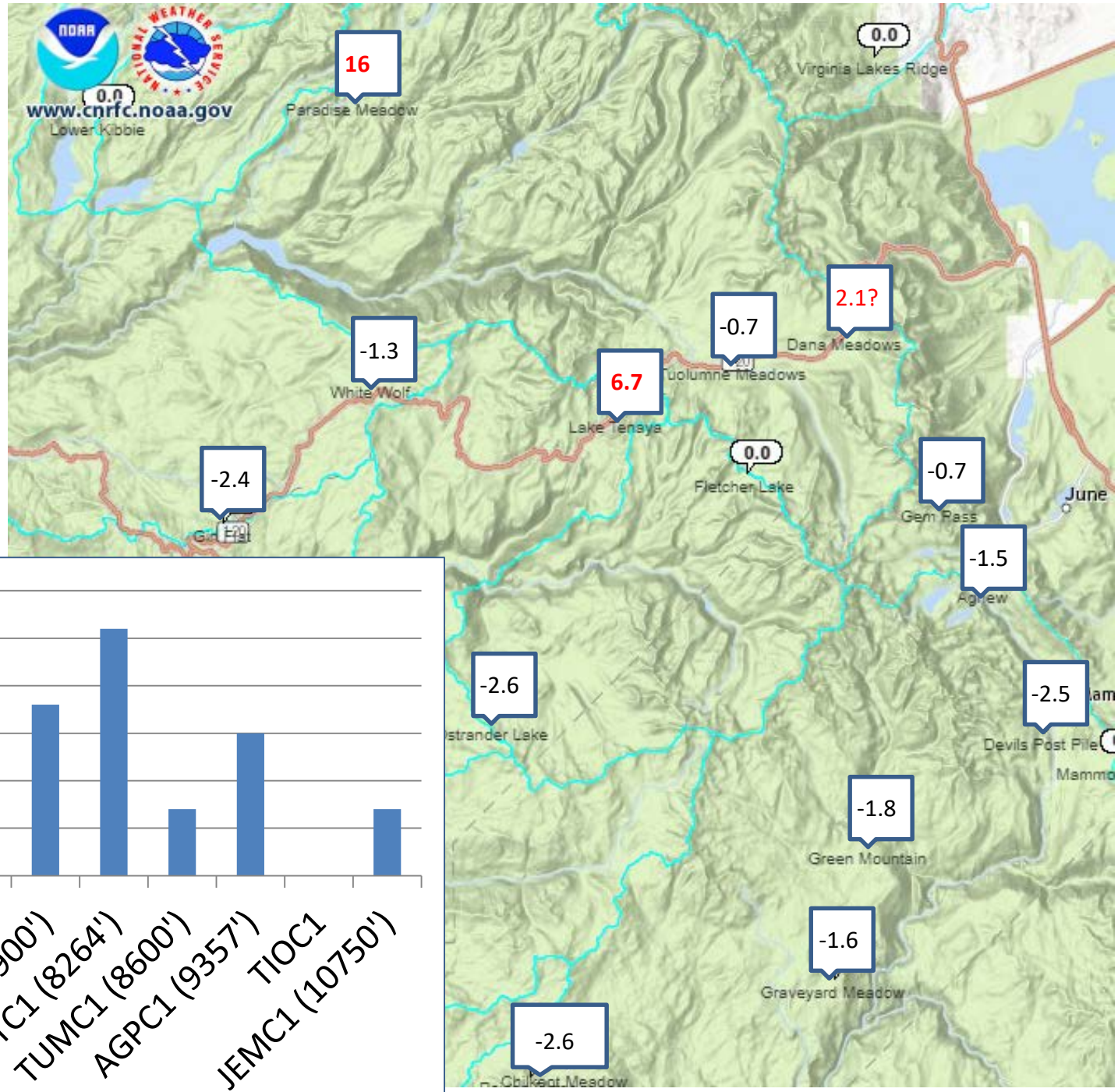
36-hour Precip. Totals

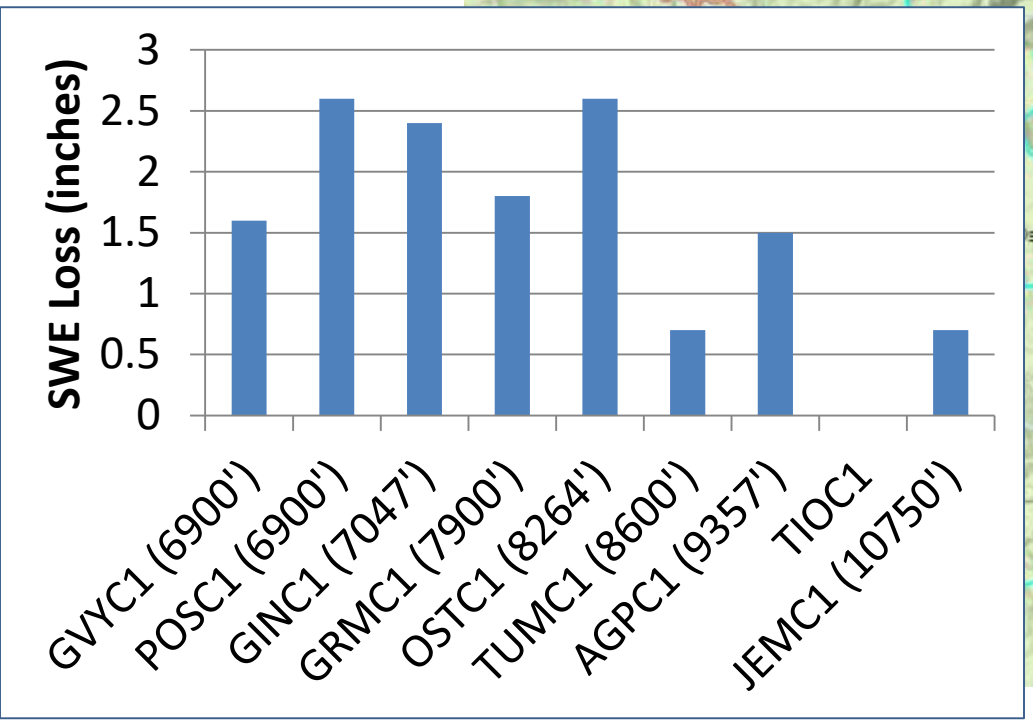
(ending 00Z 4/8/2018)



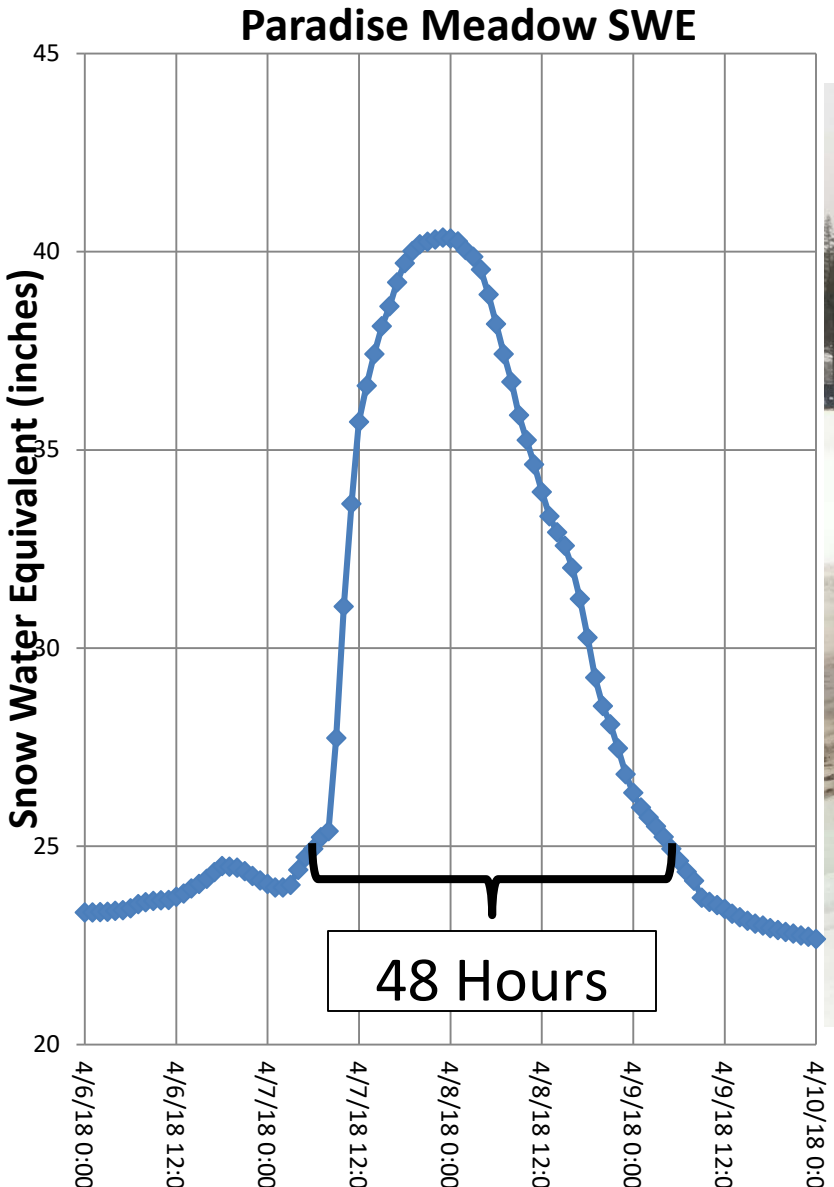
48-hour SWE Change

(ending 12Z 4/8/2018)



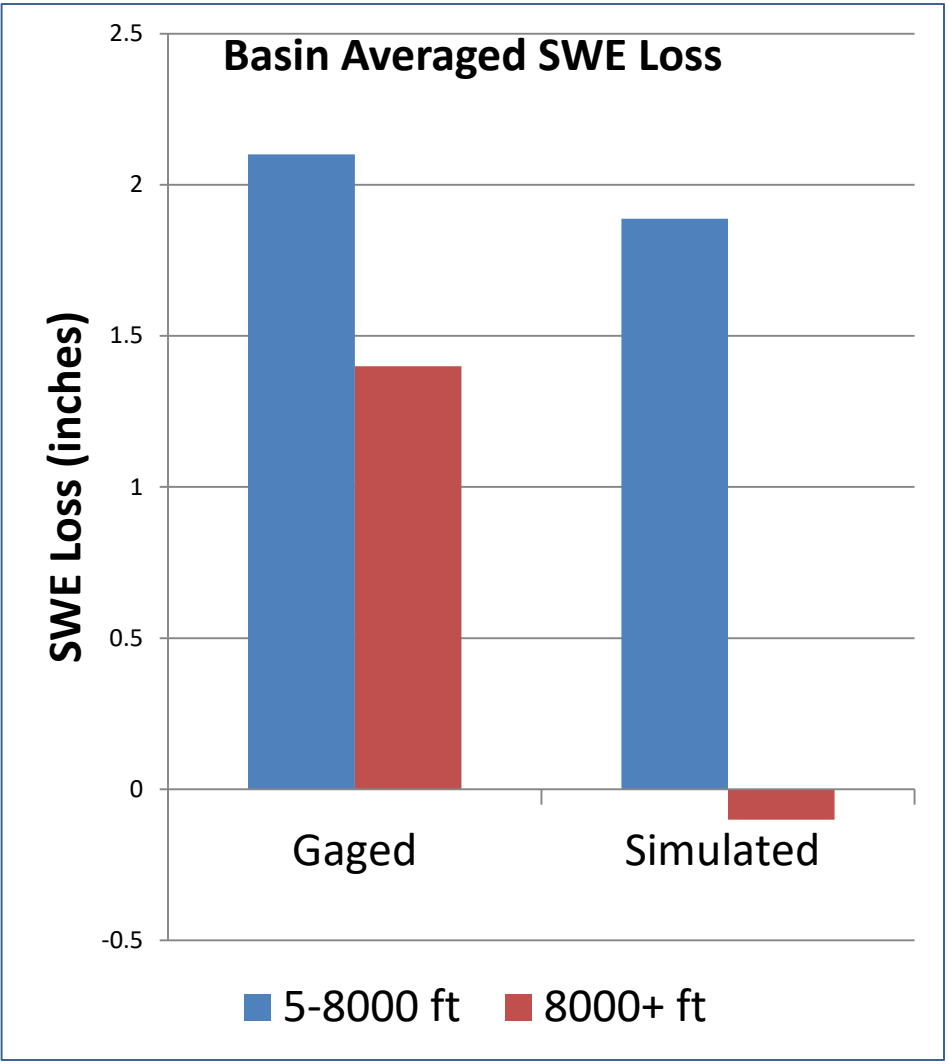


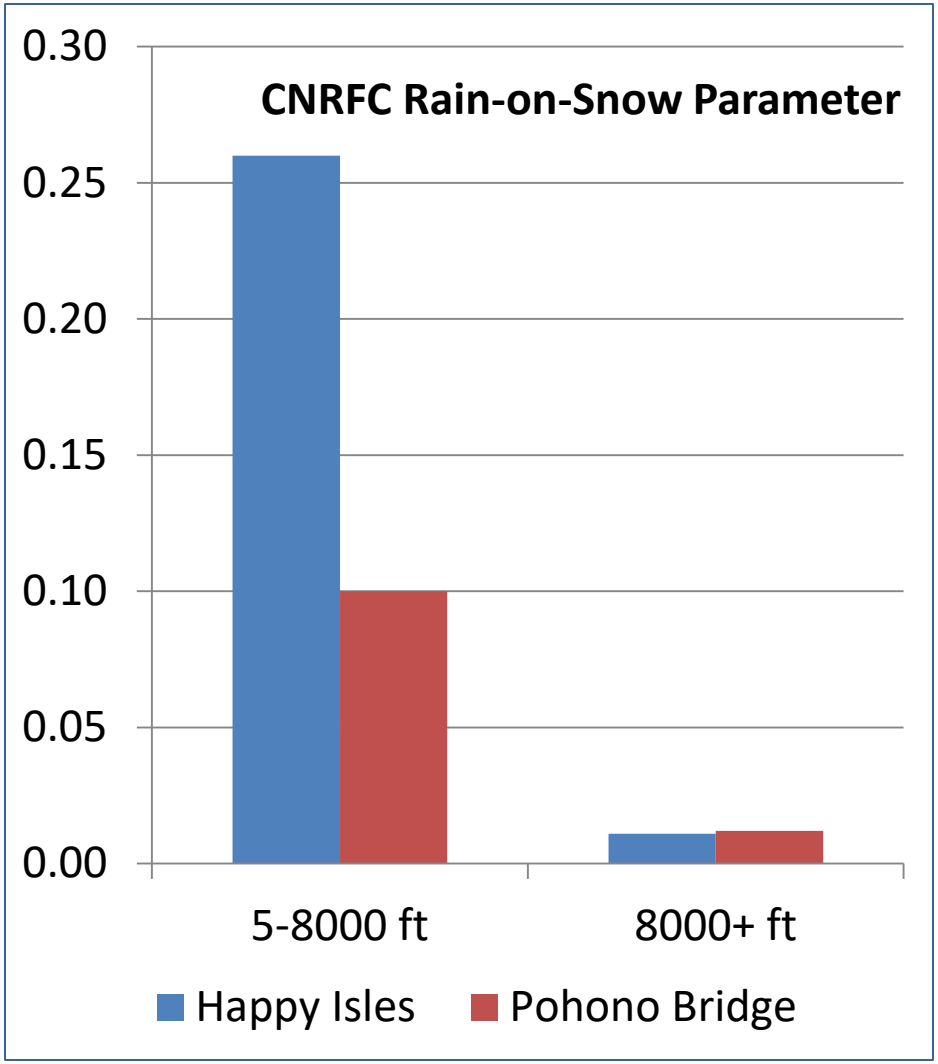
Snow Pillow Hydrographs



Kirkwood Ski Resort (4/7/2018)

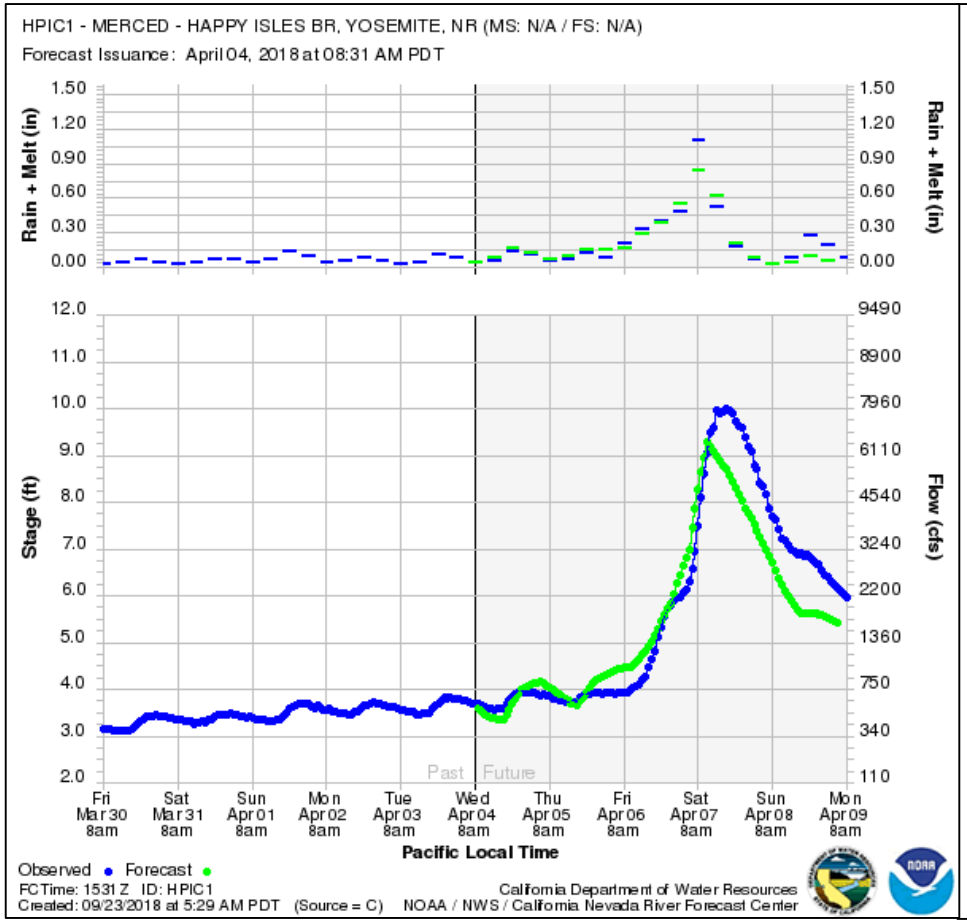
Modeled SWE loss
(Merced Watershed)



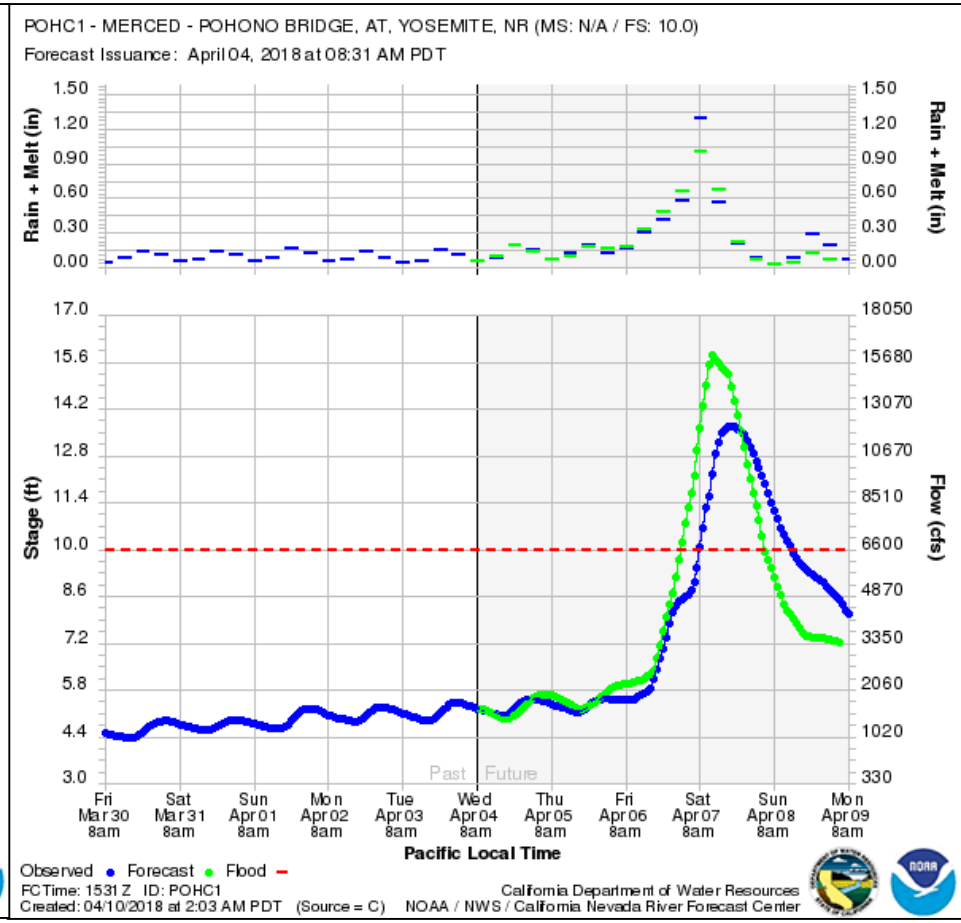


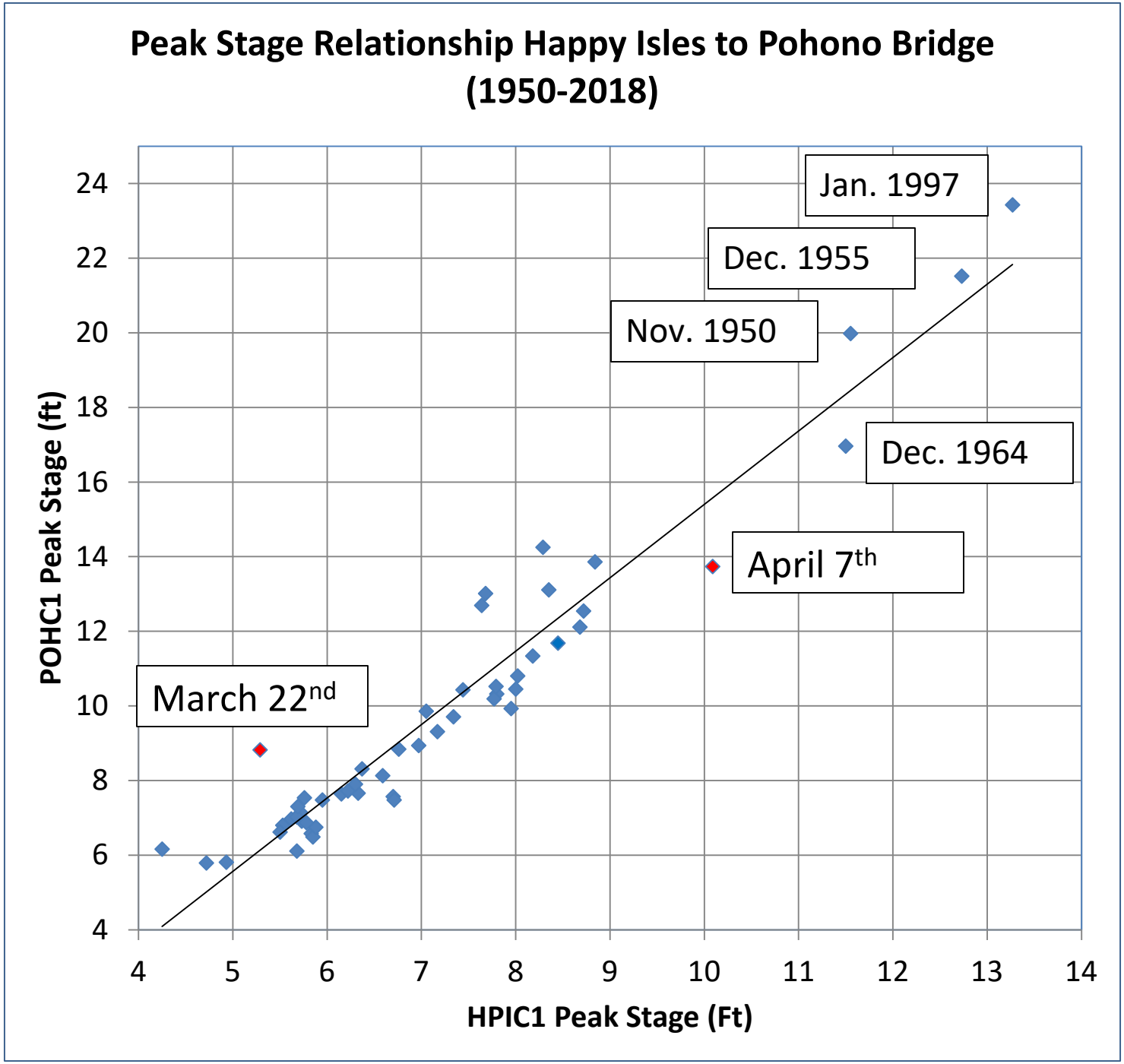
Runoff Forecasts

Happy Isles

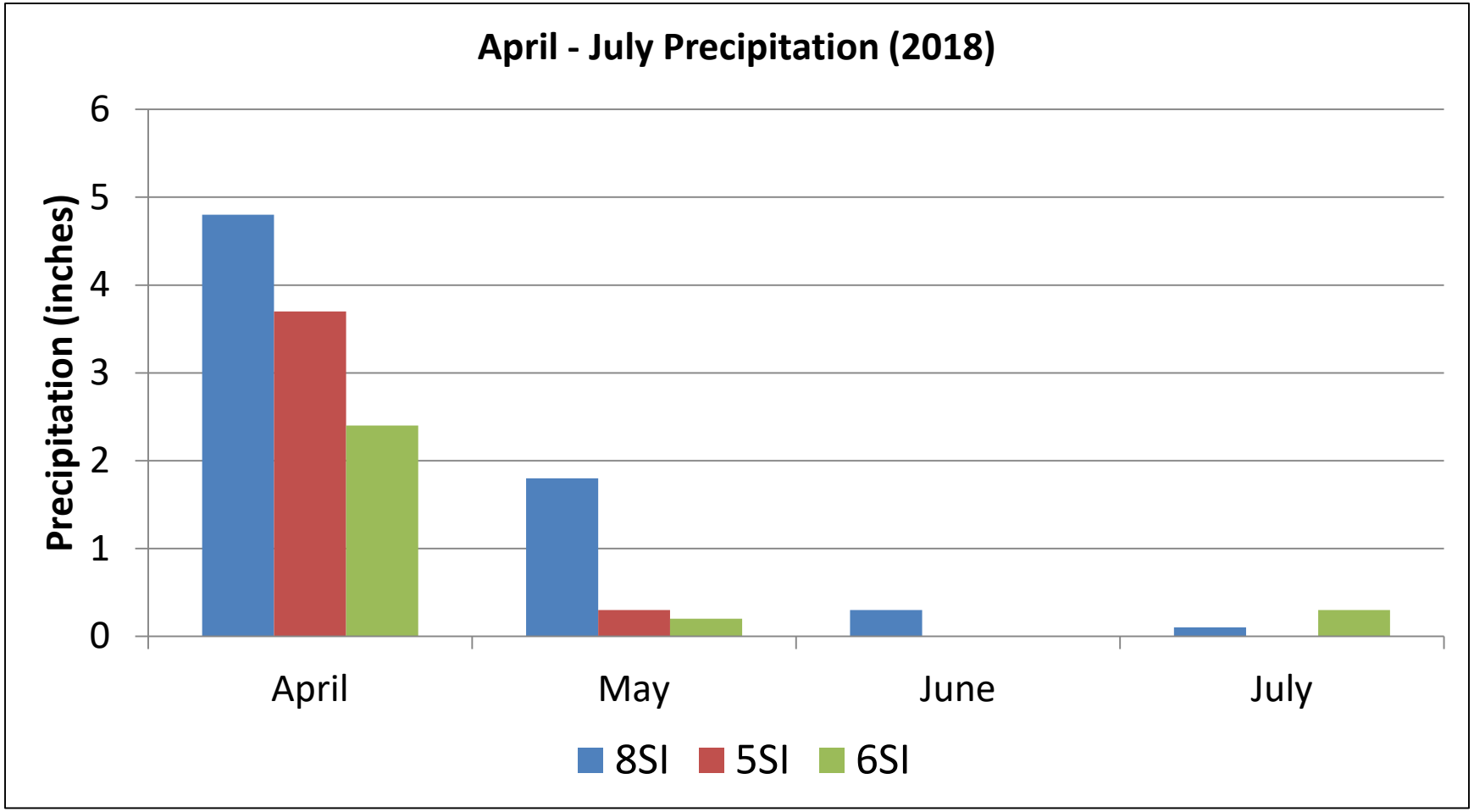


Pohono Bridge



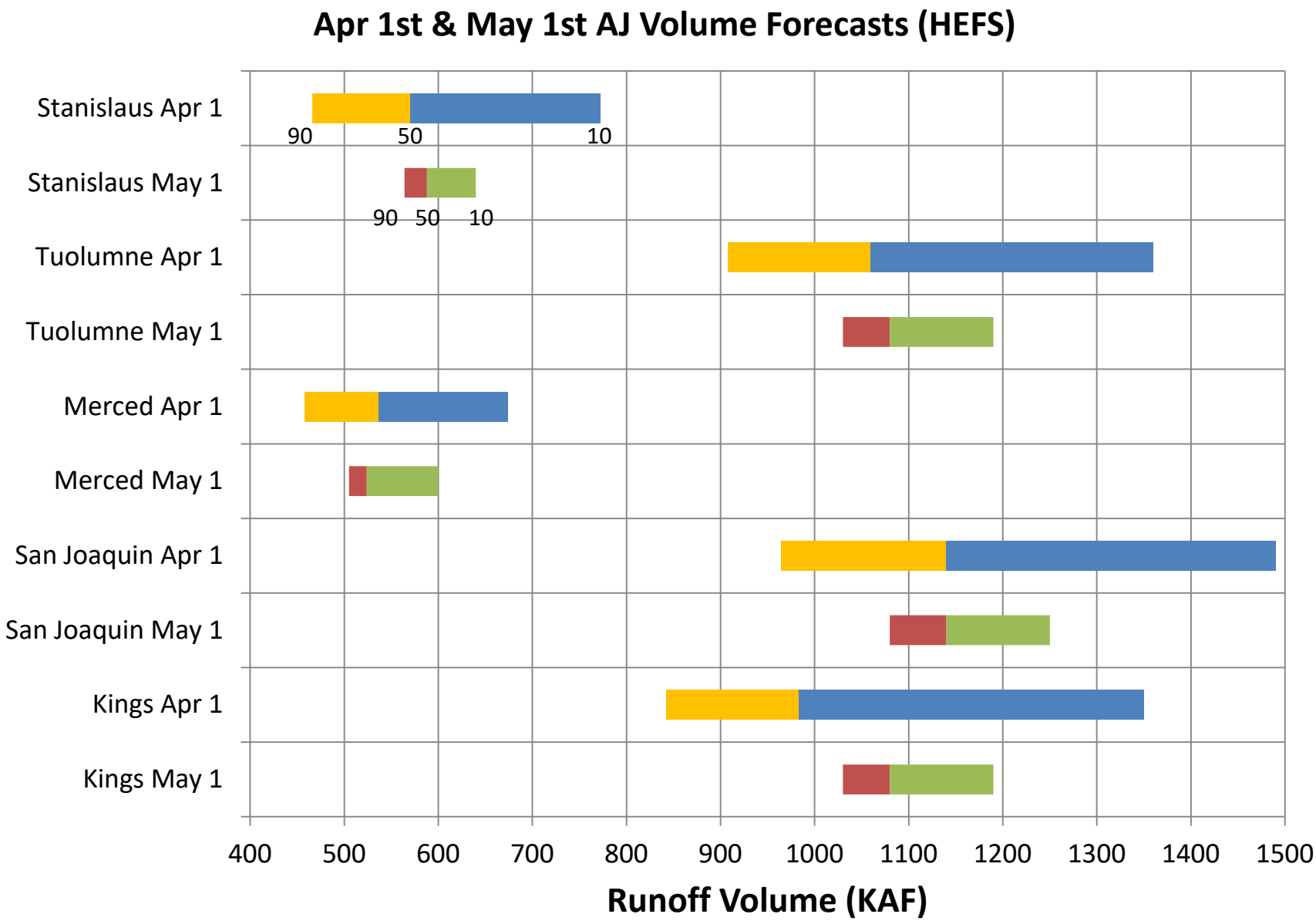

Peak Stage Relationship Happy Isles to Pohono Bridge
(1950-2018)
Jan. 1997
Dec. 1955
Nov. 1950
Dec. 1964
April 7th
March 22nd
POHC1 Peak Stage (ft)
HPIC1 Peak Stage (Ft)
24
22
20
18
16
14
12
10
8
6
4
4
5
6
7
8
9
10
11
12
13
14

Water Supply Forecasts

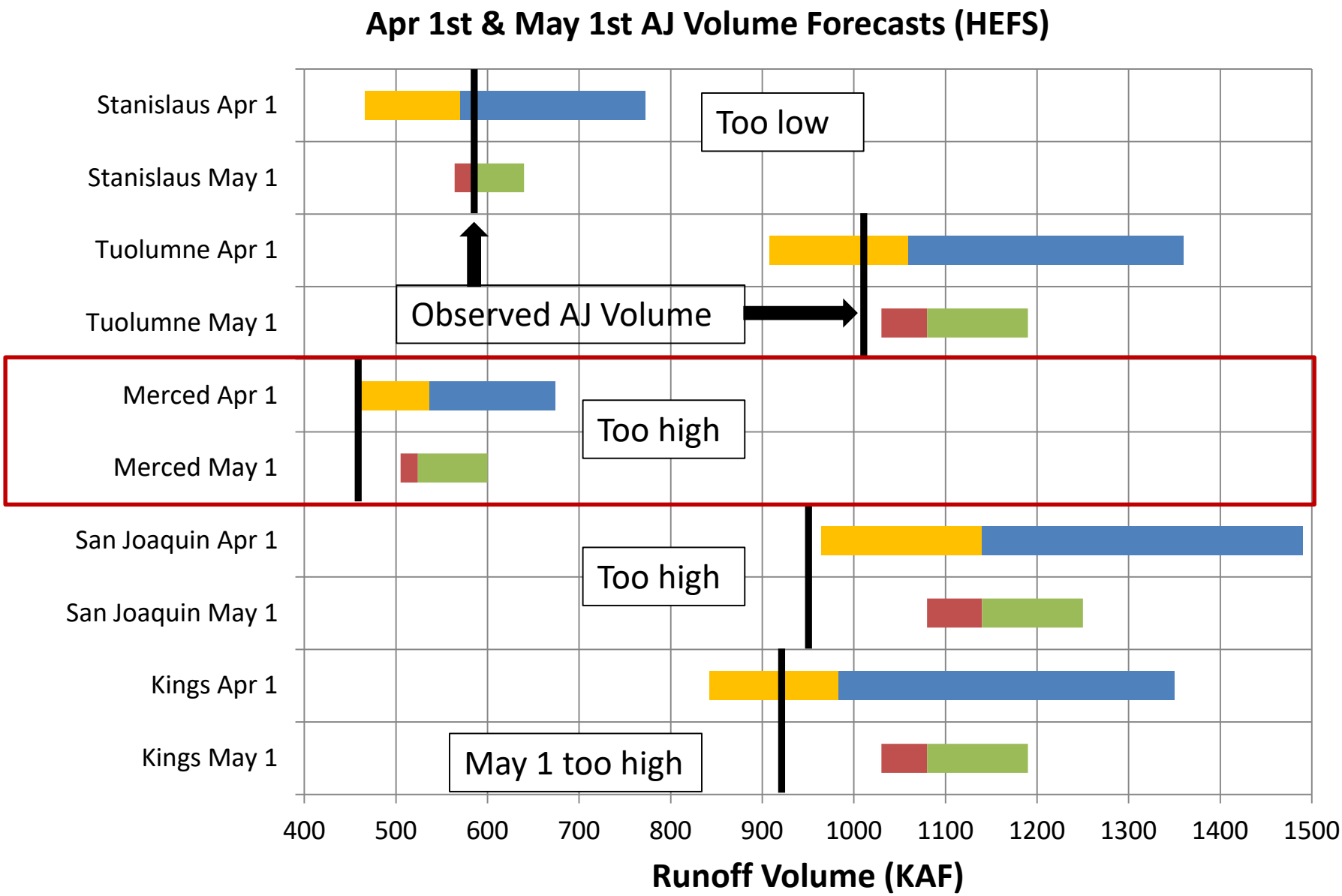


5SI : Apr-July Precip = 70th percent exceedance
May –July Precip = **driest on record**

Impact on Water Supply



Impact on Water Supply



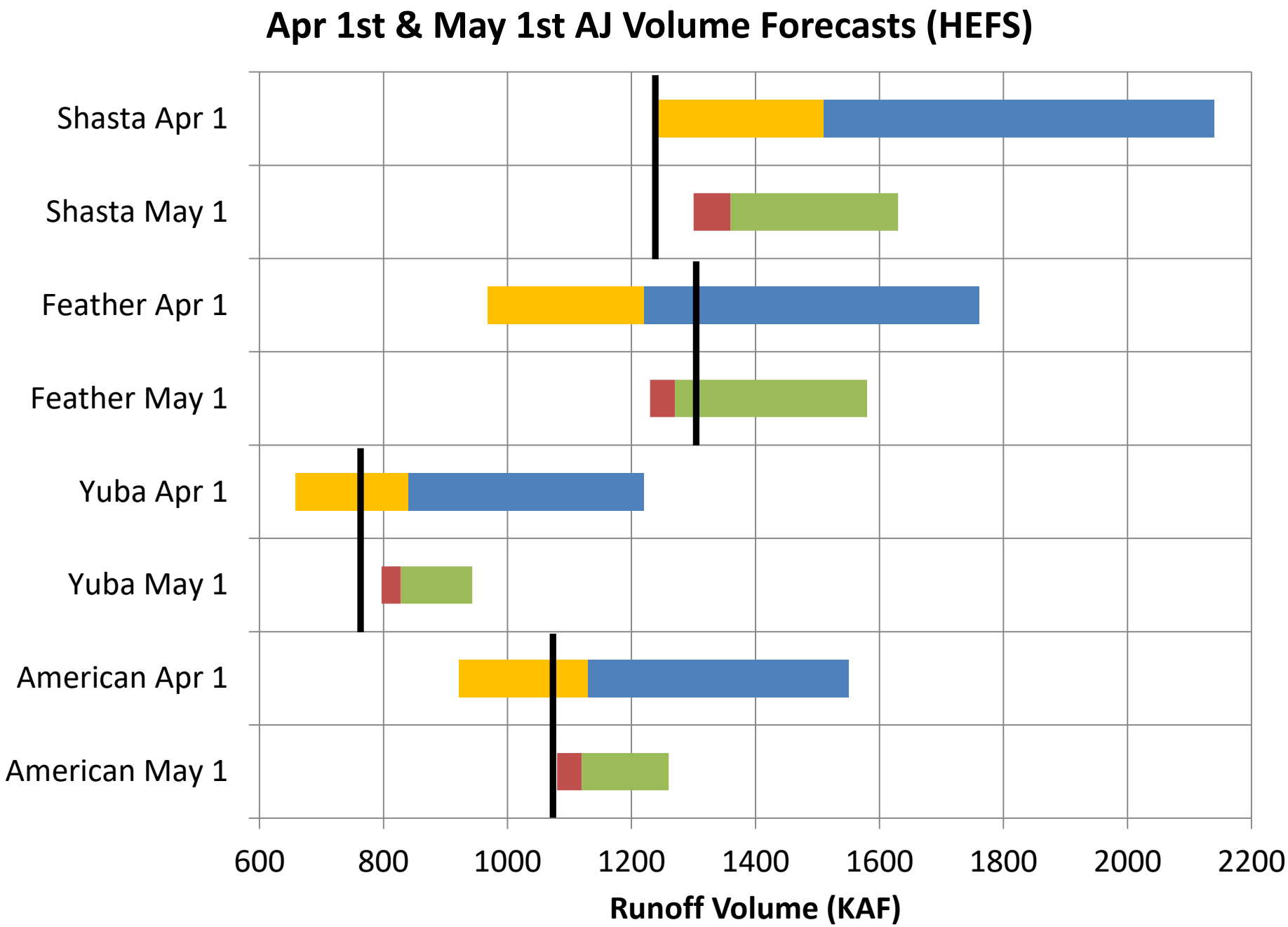
Summary

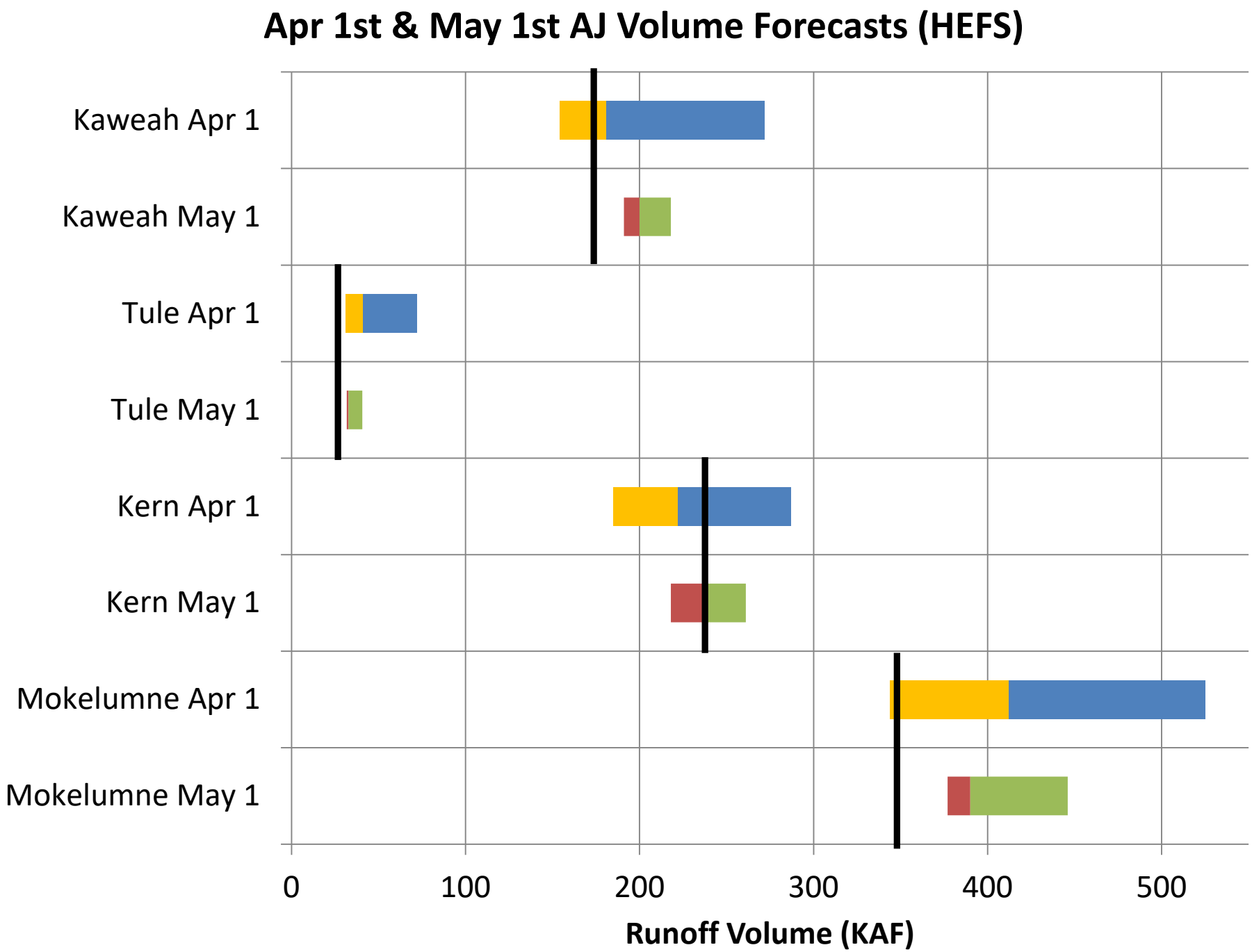
- April 6-7th event was an extreme event
  - Not rainfall
  - Rain-Snow elevation
  - TPW records

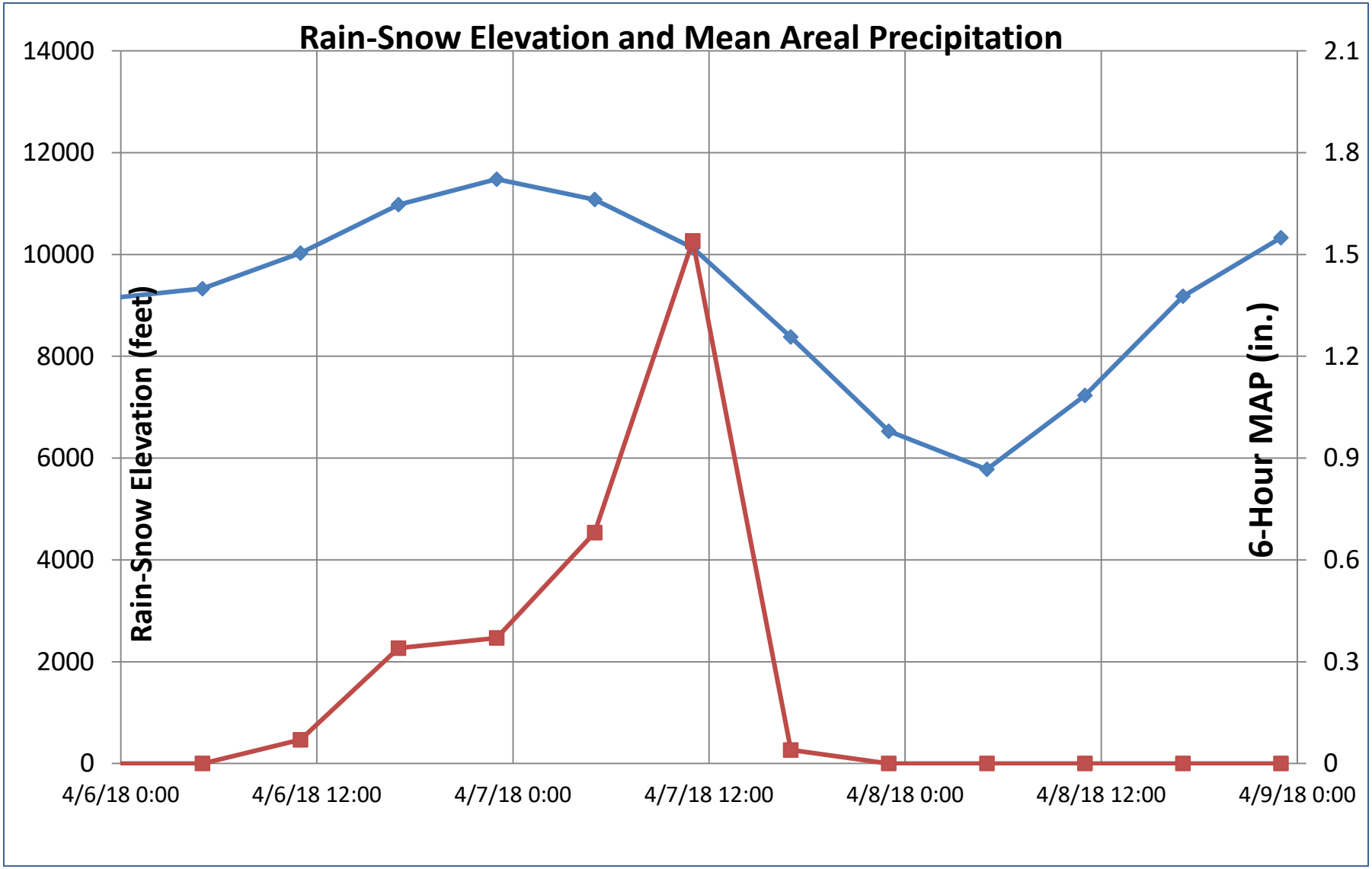
- "All models are wrong, but some are useful" (G. Box)
  - Re-calibrate high elevation rain-on-snow parameters
  - Attenuate flows after rain-on-snow events

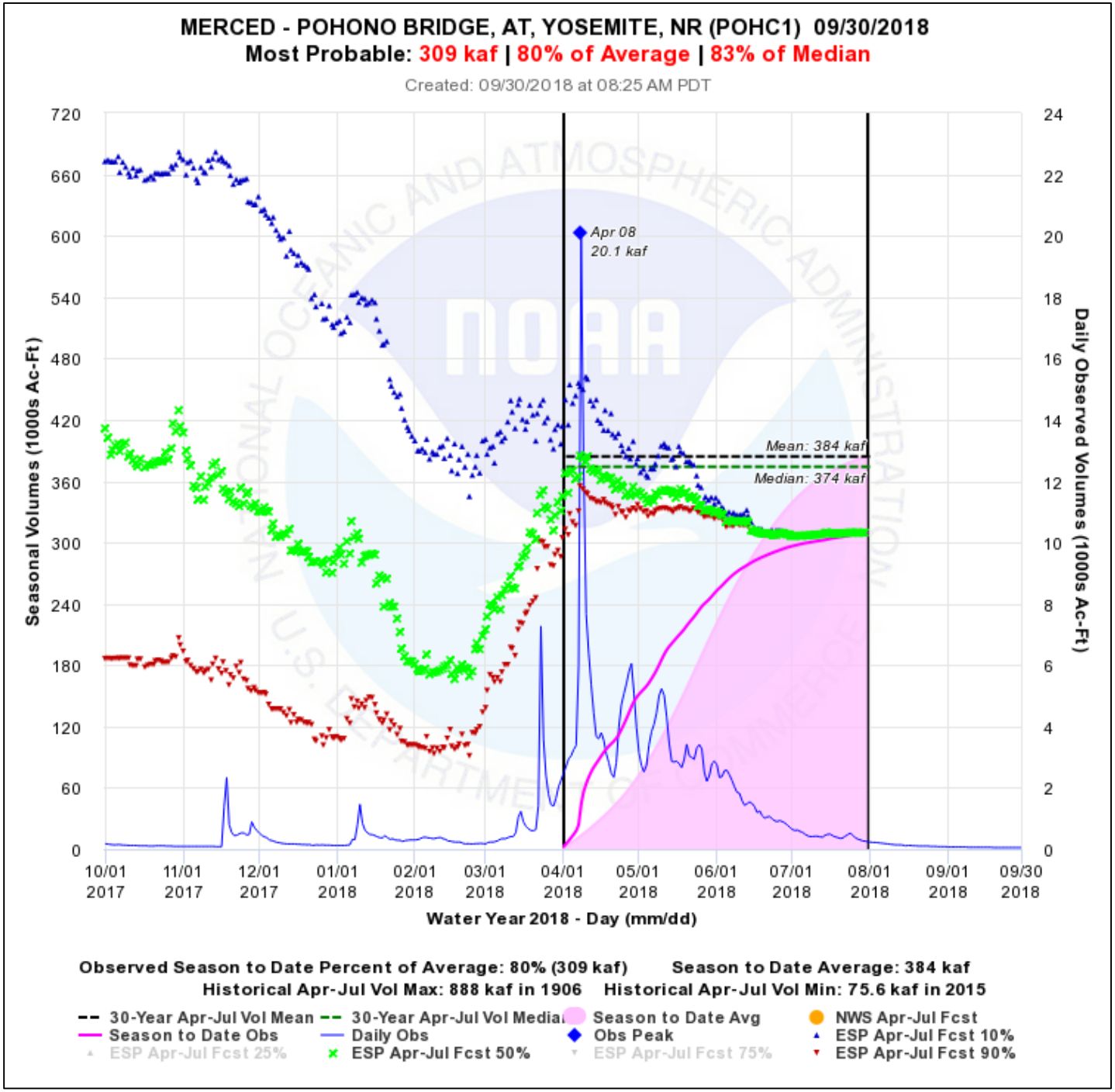
Feedback & Questions

Extra Slides


Apr 1st & May 1st AJ Volume Forecasts (HEFS)
Shasta Apr 1
Shasta May 1
Feather Apr 1
Feather May 1
Yuba Apr 1
Yuba May 1
American Apr 1
American May 1
600
800
1000
1200
1400
1600
1800
2000
2200
Runoff Volume (KAF)


Apr 1st & May 1st AJ Volume Forecasts (HEFS)
Kaweah Apr 1
Kaweah May 1
Tule Apr 1
Tule May 1
Kern Apr 1
Kern May 1
Mokelumne Apr 1
Mokelumne May 1
0
100
200
300
400
500
Runoff Volume (KAF)


Rain-Snow Elevation and Mean Areal Precipitation
Rain-Snow Elevation (feet)
6-Hour MAP (in.)
14000
12000
10000
8000
6000
4000
2000
0
2.1
1.8
1.5
1.2
0.9
0.6
0.3
0
4/6/18 0:00
4/6/18 12:00
4/7/18 0:00
4/7/18 12:00
4/8/18 0:00
4/8/18 12:00
4/9/18 0:00


MERCED - POHONO BRIDGE, AT, YOSEMITE, NR (POHC1) 09/30/2018
Most Probable: 309 kaf | 80% of Average | 83% of Median
Created: 09/30/2018 at 08:25 AM PDT
Seasonal Volumes (1000s Ac-Ft)
Daily Observed Volumes (1000s Ac-Ft)
Apr 08
20.1 kaf
Mean: 384 kaf
Median: 374 kaf
10/01 2017
11/01 2017
12/01 2017
01/01 2018
02/01 2018
03/01 2018
04/01 2018
05/01 2018
06/01 2018
07/01 2018
08/01 2018
09/01 2018
09/30 2018
Water Year 2018 - Day (mm/dd)
Observed Season to Date Percent of Average: 80% (309 kaf)
Season to Date Average: 384 kaf
Historical Apr-Jul Vol Max: 888 kaf in 1906
Historical Apr-Jul Vol Min: 75.6 kaf in 2015
30-Year Apr-Jul Vol Mean
30-Year Apr-Jul Vol Median
Season to Date Avg
NWS Apr-Jul Fcst
Season to Date Obs
Daily Obs
Obs Peak
ESP Apr-Jul Fcst 10%
ESP Apr-Jul Fcst 25%
ESP Apr-Jul Fcst 50%
ESP Apr-Jul Fcst 75%
ESP Apr-Jul Fcst 90%