



LET IT RAIN

**WE NEED ANOTHER PRECIPITATION
INDEX.....MORE THE BETTER.....**

**PRESENTING:
THE SOUTHERN SIERRA
PRECIPITATION INDEX**

2014 California Cooperator's
Snow Conference,
Kings Beach, CA
Nov 5-7, 2014
Steve Nemeth

Current Sierra precip indexes...

- Northern Sierra 8 13100 sq. mi 50.0"
- Central Sierra 5 5125 sq. mi 40.8"
- Southern Sierra ? 4575 sq. mi ?

What are the criteria for choosing a station?

- basin representation...no brainer
- daily data – QC'd AND in CDEC every morning
- monthly data back to early 1920's for good historical record
- area-weighted avg of all precip stations should be close to the area-weighted avg of the index stations.

Basin Representation...

How big are the basins?

<u>Basin</u>	<u>Area</u>	<u>% of area</u>
Kings	1540 sq mi.	34
Kaweah	563	12
Tule	390	9
Kern	2080	45

Some process needs to account for the large variance in basin size.

GOAL: the regional weighted average = the weighted average of the index stations

<u>Basin</u>	<u>P, precip avg (in)</u>	<u>A, area (sq mi)</u>	<u>P x A</u>
Kings	30.59	1540	47109
Kaweah	31.50	563	17750
Tule	32.50	390	12675
<u>Kern</u>	<u>19.26</u>	<u>2080</u>	<u>40057</u>
		Sum = 4573	117591

$(P \times A) / \text{area} = 25.71''$

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Finding a long record...not the easiest part of the job...is a mile too far?

- In some cases, two data sets for the same location were used then checked using a plot of accumulated precipitation.**

It is time to see the list of index stations.

6 Stations in the Tulare Lake Basin Precipitation Index

Station

Basin

Balch PH

Kings

Giant Forest

Kaweah

Ash Mt.

Kaweah

Springville

Tule

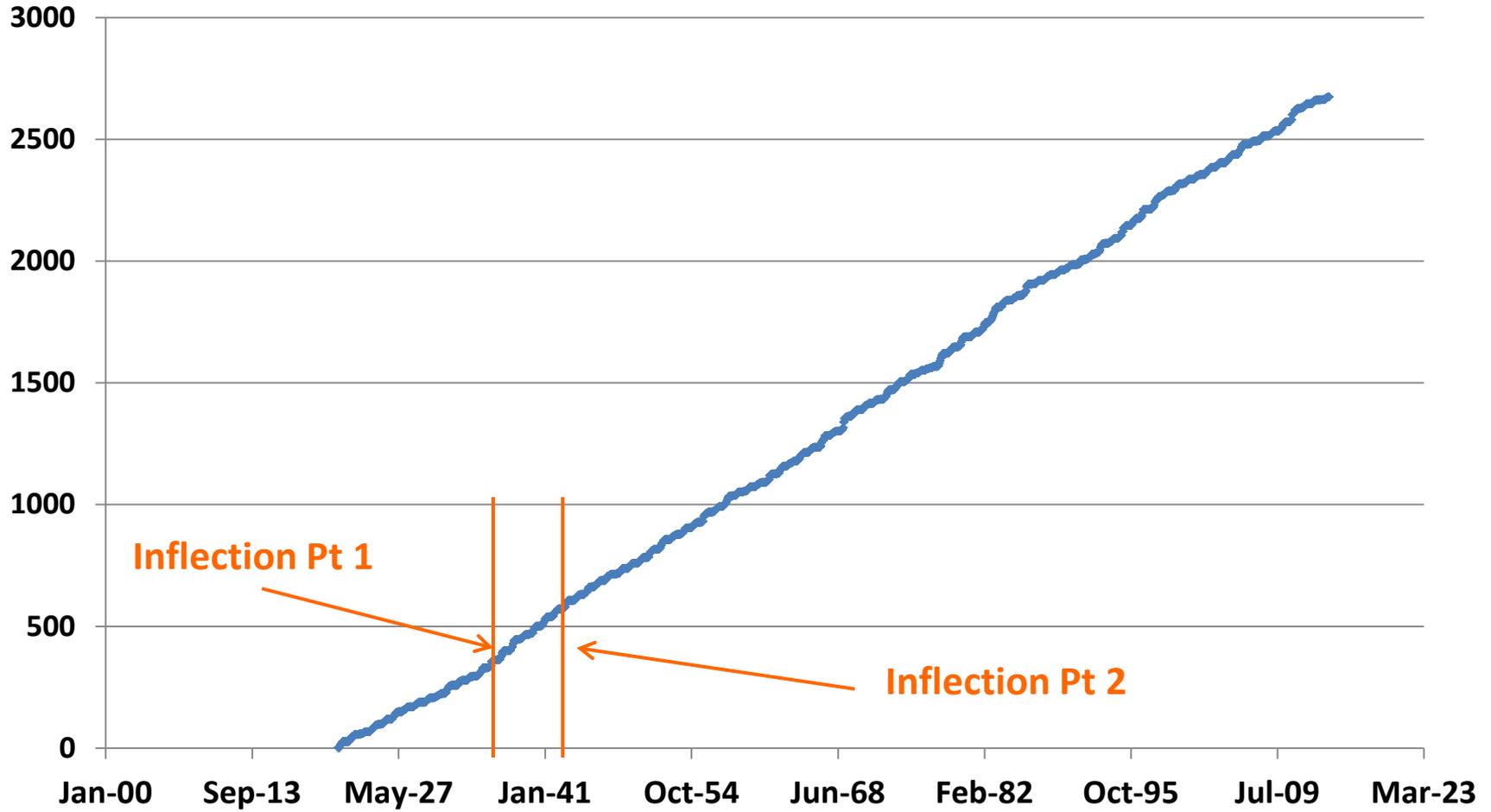
Pascoes

Kern

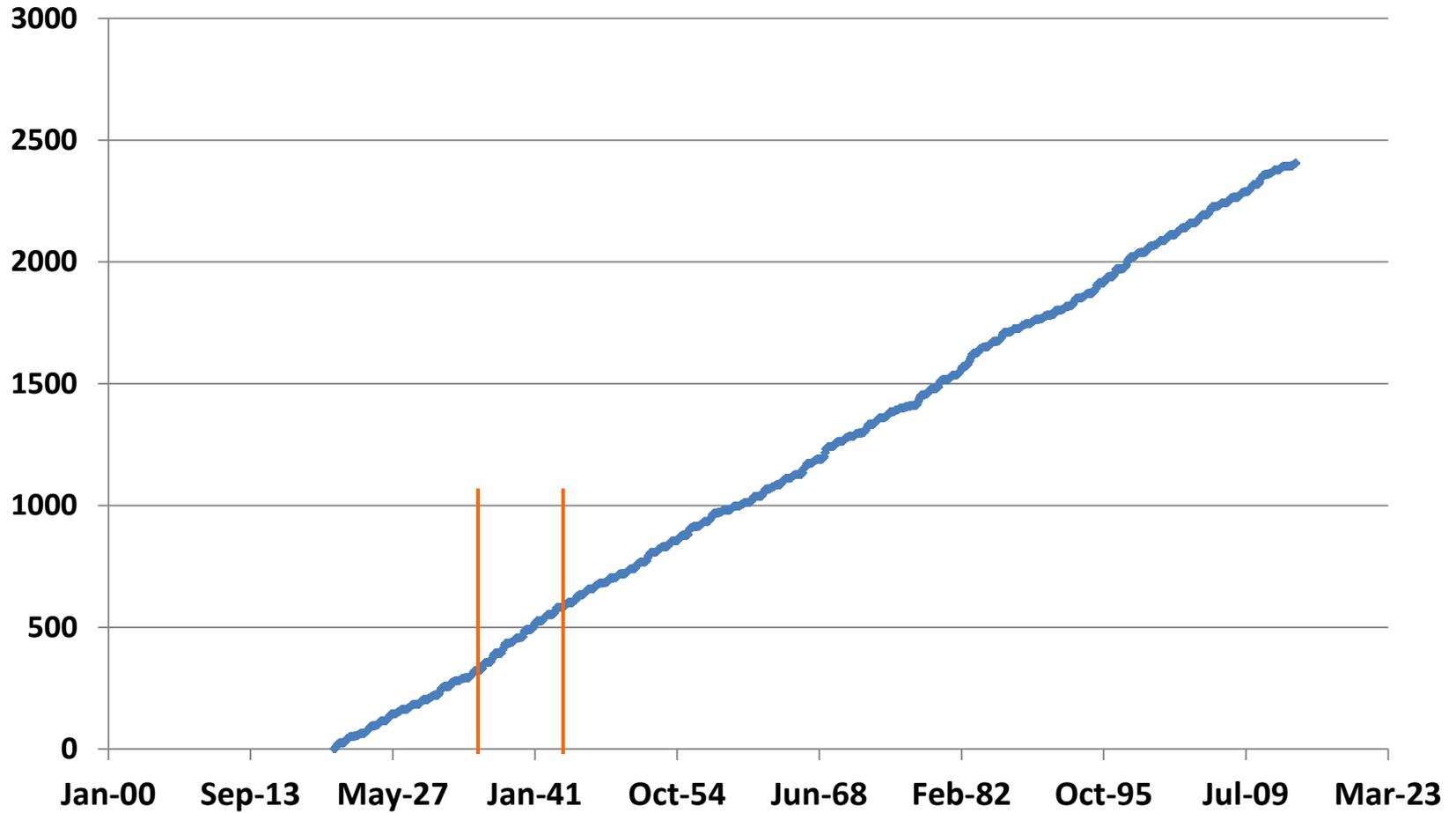
Isabella Dam

Kern

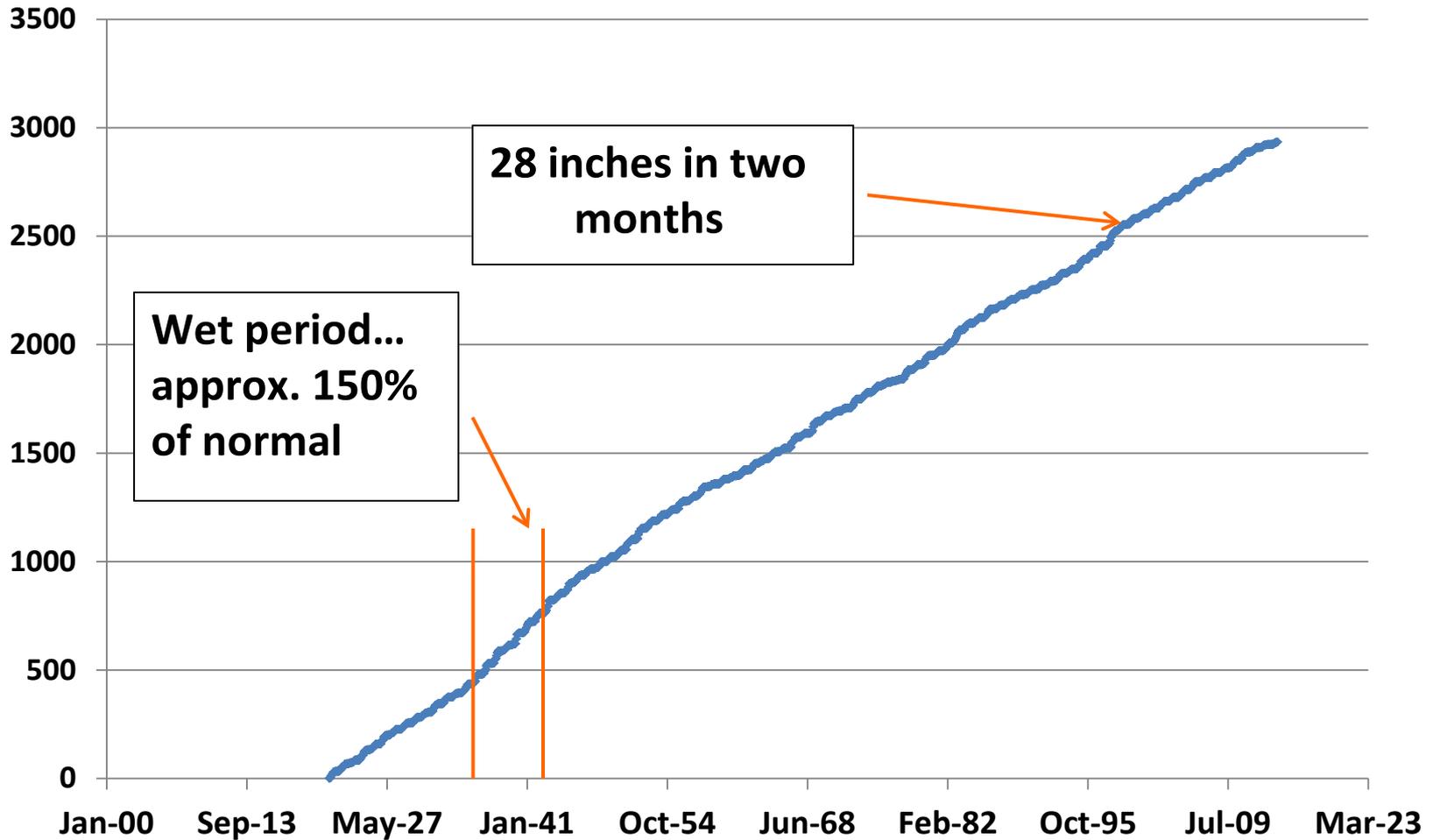
Accumulated Precip - Balch PH



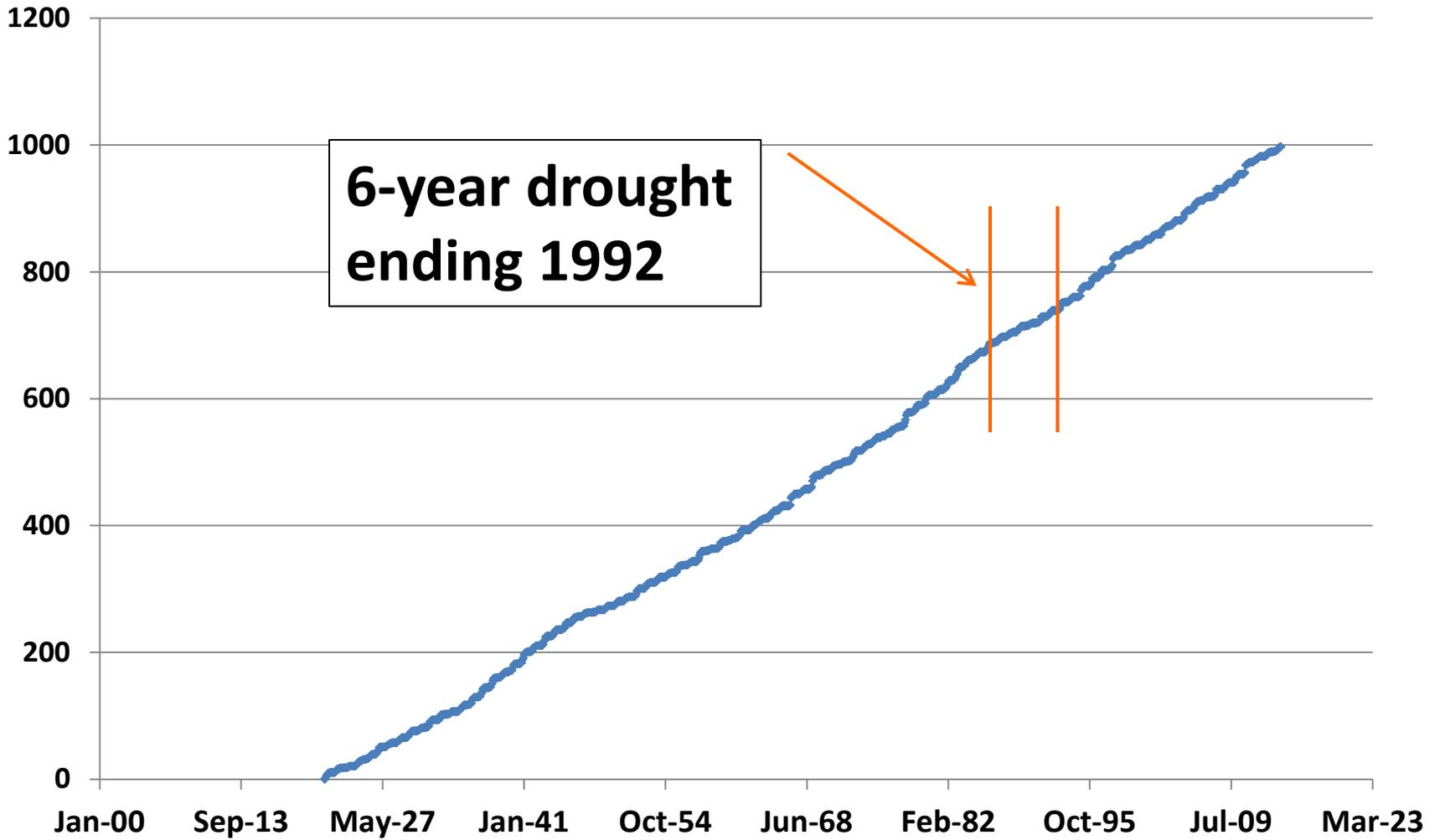
Accumulated Precip - Ash Mt.



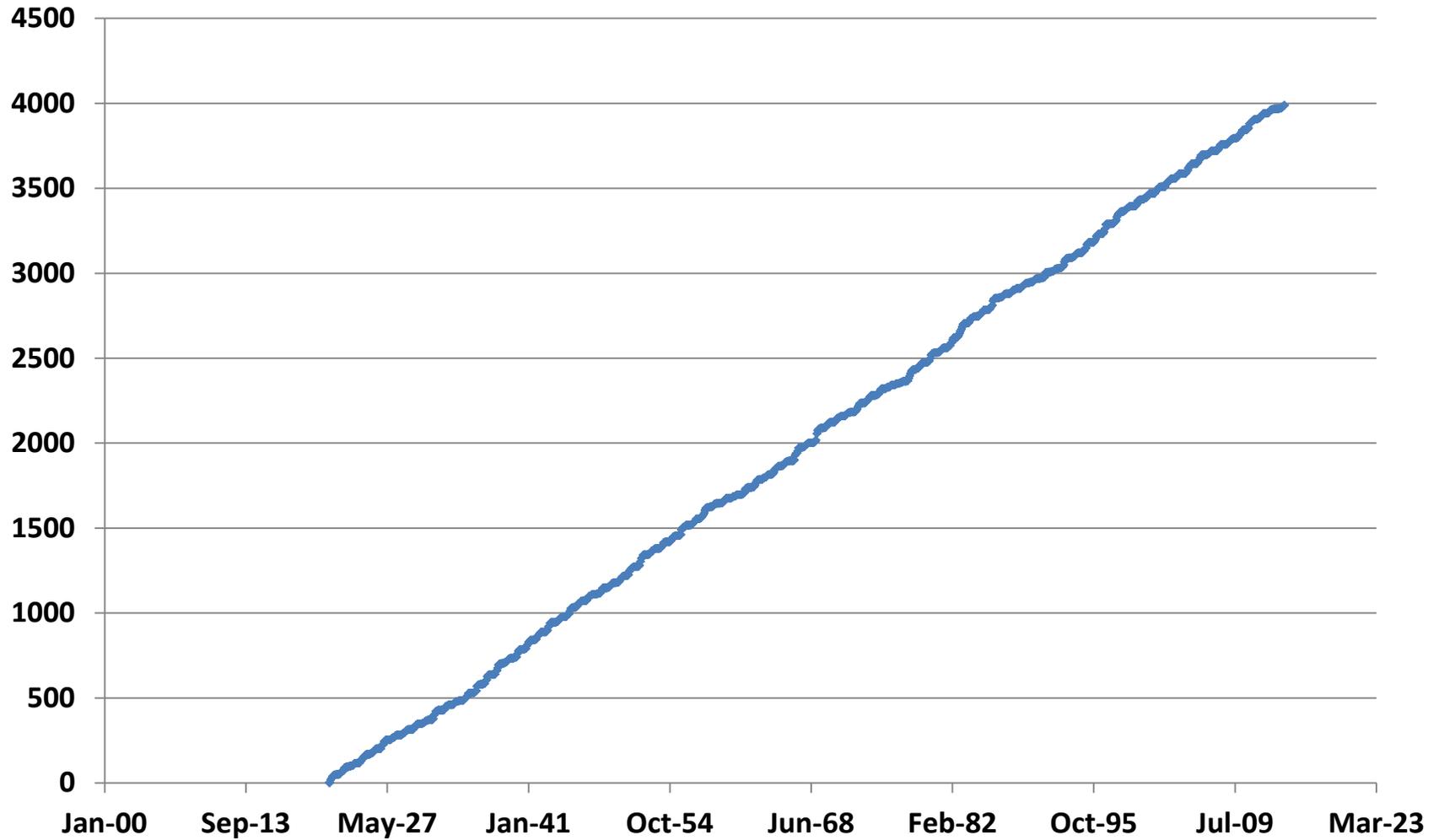
Accumulated Precip - Springville



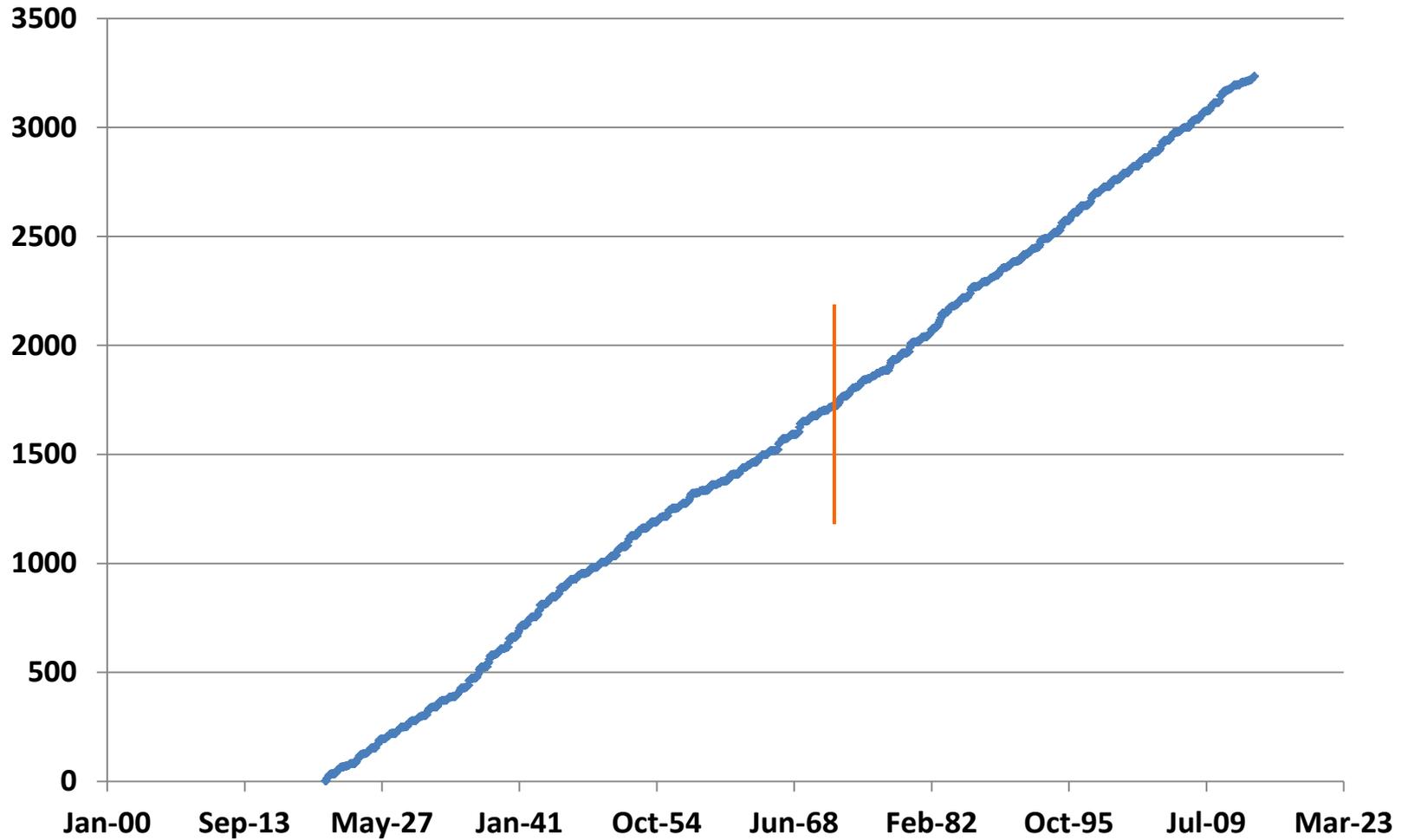
Accumulated Precip - Isabella



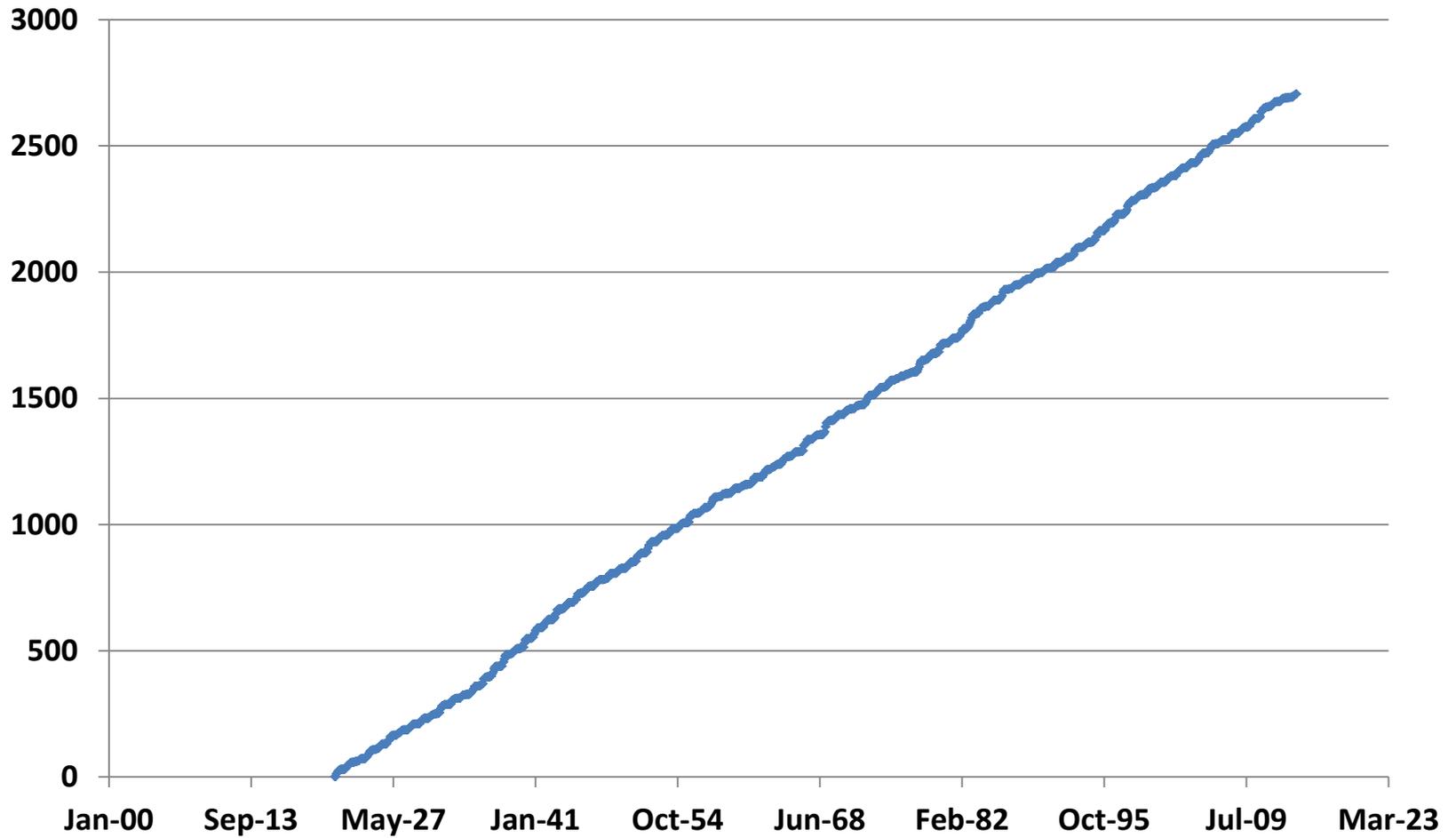
Accumulated Precip - Giant Forest



Accumulated Precip - Pascoes



Accumulated Precip - 6-Station Index





**Giant
Forest**

**Is our high tech ~~world~~ universe
perfect...or good enough?**

All is OK



Not OK



Is our high tech world perfect?

The answer is NO...

**What happens when a station goes
down?**

Is our high tech world perfect?

The answer is NO...

What happens when a station goes down?

Solution = there is a backup station for each of the 6 stations

Monthly averages are used for backup data

	Primary station averages (in)	Alt station averages (in)	Ratio of Primary to Alt station
	Giant Forest	Bear Trap Md	
Oct	1.53	1.70	0.90
Nov	4.28	4.70	0.91
Dec	7.77	8.50	0.91
Jan	7.81	8.60	0.91
Feb	7.92	8.70	0.91
Mar	6.36	7.00	0.91
Apr	4.89	5.40	0.91
May	1.72	1.90	0.91
Jun	0.62	0.70	0.89
Jul	0.13	0.10	1.30
Aug	0.15	0.20	0.75
Sep	0.45	0.50	0.90
	43.63	48.00	

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Is the new average worth anything?

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What is the area-weighted average of the 6 stations?

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What is the area-weighted average of

the 6 stations?

27.2''

Math behind the scenes...

The 8-Station and 5-station indexes do not use the Precip x Area method.

For consistency, the 6-station index will not either.

The straight average of the 6- stations is 29.3"

All Sierra precip indexes...

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THE END