CalClim at WRCC: Monitoring California Climate

Desert Research Institute

Western Regional Climate Center

Laura M. Edwards

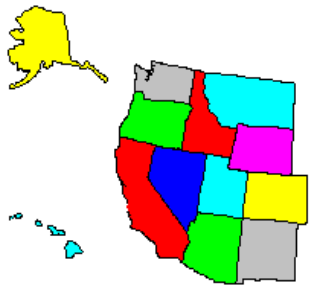
Kelly T. Redmond

ARB Atmospheric Science Seminar, April 19, 2005

http://www.calclim.dri.edu

In Brief...

- WRCC
- Motivation for CalClim
- About CalClim
- Data & Products
- Current activities
- Summary



Western Regional Climate Center

2215 Raggio Parkway
Reno, Nevada 89512

Phone: (775) 674-7010
Fax: (775) 674-7016

e-mail: wrcc@dri.edu

Site Map

Historical Climate Information
Western U.S. Historical Summaries; Precipitation Maps; Station Inventories; Wind and Evaporation Data; Coastal Water Table; etc.

Current Observations and Forecasts
Nat'l Weather Service Current and Past 24-hour Reports; Snotel; Climate Prediction Center Outlooks; Satellite and Radar Imagery; etc.

WRCC Projects
El Nino & La Nina; CEMP; WET; BLM RAWS; Current Weather Plots; Photo Gallery; Webcam; etc.

Climate Monitoring
Anomalies (Snotel & Airports); SPI; Product List; WGA data and information; etc.

More Climate Information
Pricing and Formats; Solar Radiation (U of Oregon); Sunrise/Sunset Information (USNO); Divisional Climate Plots; etc.

Educational and Travel Pages
Terms; More about Weather and Climate - for teachers and kids! Climate for resorts and Nat'l parks around the West.

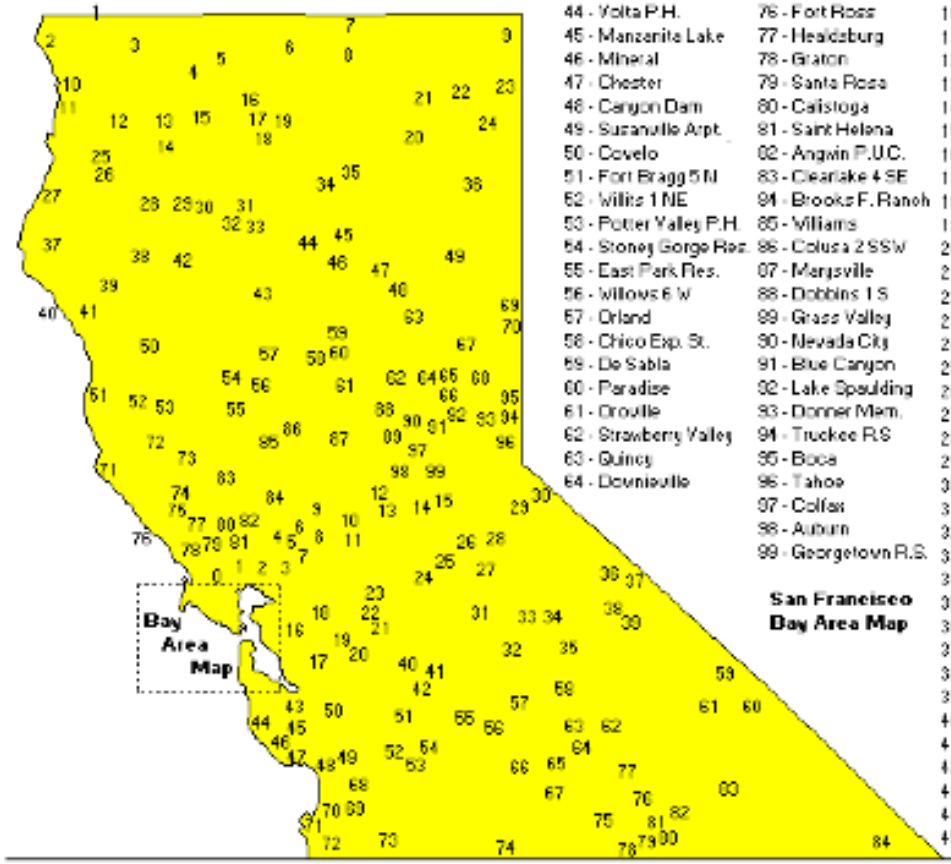
Non-WRCC Climate Resources
National Climatic Data Center; Climate Prediction Center; National Drought Mitigation Center; CEFA; etc.

About the WRCC
Staff; Funding; Overview of WRCC; DRI Home Page; INTERNAL; etc.

WRCC Supports a Three-Partner National Climate Services Program - the Partners Include:
National Climatic Data Center (NCDC), Regional Climate Centers (RCC's), and State Climate Offices.

This is the new WRCC web page, you can still go to the old WRCC home page.

WRCC California Data



Northern

1 - Elk Valley
2 - Crescent City
3 - Happy Camp R.S.
4 - Fort Jones R.S.
5 - Yreka
6 - Mount Hebron R.S.
7 - Tulelake
8 - Lava Beds N.M.
9 - Fort Bidwell
10 - Klamath
11 - Orick Prairie Cr.
12 - Orleans
13 - Sawyers Bar R.S.
14 - Cedarville 1 SE
15 - Callahan
16 - Weed F. D.
17 - Mount Shasta
18 - Dunsmuir T. P.
19 - Mc Cloud
20 - Adin R.S.
21 - Canby R.S.
22 - Alturas R.S.
23 - Cedarville
24 - Jess Valley
25 - Hoopa
26 - Willow Creek
27 - Eureka
28 - Big Bar R.S.
29 - Weaverville R.S.
30 - Trinity River H.
31 - Shasta Dam
32 - Whiskeytown R.
33 - Redding
34 - Burney
35 - Hat Creek P.H.
36 - Termo 1 E
37 - Scotia
38 - Forest Glen
39 - Alderpoint
40 - Shelter Cove A.
41 - Richardson Gr.
42 - Harrison G. R.S.
43 - Red Bluff
44 - Volta P.H.
45 - Manzanita Lake
46 - Mineral
47 - Chester
48 - Canyon Dam
49 - Susanville Arpt.
50 - Covelo
51 - Fort Bragg 5 N
52 - Willits 1 NE
53 - Potter Valley P.H.
54 - Stoney Gorge Res.
55 - East Park Res.
56 - Willows 6 W
57 - Orland
58 - Chico Exp. St.
59 - De Sabla
60 - Paradise
61 - Oroville
62 - Strawberry Valley
63 - Quincy
64 - Downieville
65 - Sierra City
66 - Bowman Dam
67 - Portola
68 - Sierraville R.S.
69 - Doyle
70 - Doyle 4 SSE
71 - Point Arena
72 - Ukiah
73 - Lakeport
74 - Cloverdale 3 S
75 - Warm Springs
76 - Fort Ross
77 - Healdsburg
78 - Graton
79 - Santa Rosa
80 - Calistoga
81 - Saint Helena
82 - Angwin P.U.C.
83 - Clearlake 4 SE
84 - Brooks F. Ranch
85 - Williams
86 - Colusa 2 SSW
87 - Marysville
88 - Dobbins 1 S
89 - Grass Valley
90 - Nevada City
91 - Blue Canyon
92 - Lake Spaulding
93 - Donner Mem.
94 - Truckee R.S
95 - Boca
96 - Tahoe
97 - Colfax
98 - Auburn
99 - Georgetown R.S.

San Francisco Bay Area Map

Southern

0 - Petaluma F.S.
1 - Sonoma
2 - Napa State H.
3 - Fairfield
4 - Markley Cove
5 - Lake Solano
6 - Winters
7 - Vacaville
8 - Davis 1 WSV
9 - Woodland
10 - Sacramento WSO
11 - Sacramento Arpt
12 - Rocklin
13 - Folsom Dam
14 - Placerville
15 - Placerville IFG
16 - Mount Diablo Jct.
17 - Livermore
18 - Antioch Pump P.
19 - Tracy P. P.
20 - Tracy Carbona
21 - Stockton WSO
22 - Stockton F.S.
23 - Lodi
24 - Camp Pardee
25 - Electra P.H.
26 - Tiger Creek P.H.
27 - Calaveras Big Trees
28 - Salt Springs P.H.
29 - Twin Lakes
30 - Woodfords
31 - Sonora R.S.
32 - Dudleys
33 - Cherry Valley Dam
34 - Hetch Hetchy
35 - Yosemite Park H.Q.
36 - Bridgeport
37 - Bodie
38 - Mono Lake
39 - Lee Vining
40 - Modesto
41 - Denair 3 NNE
42 - Turlock
43 - San Jose
44 - San Gregorio 2 SE
45 - Los Gatos
46 - Ben Lomond 4
47 - Santa Cruz
48 - Watsonville Waterworks
49 - Gilroy
50 - Mount Hamilton
51 - Newman
52 - San Luis Dam
53 - Los Banos Det. Res.
54 - Los Banos
55 - Merced Arpt.
56 - Le Grand
57 - Cathay Bull Run R.
58 - S. Entrance Yosemite
59 - White Mountain 2
60 - Deep Springs College
61 - Bishop Arpt.
62 - Huntington Lake
63 - North Fork R.S.
64 - Auberry 1 NW
65 - Friant Gov. Camp
66 - Madera
67 - Fresno Arpt
68 - Hollister
69 - Salinas 2 E
70 - Salinas Arpt.
71 - Monterey
72 - Carmel Valley
73 - Pinnacles N.M.
74 - Five Points 5 SSW
75 - Orange Cove
76 - Grant Grove
77 - Balch P.H.
78 - Lemon Cove
79 - Three Rivers Ham.
80 - Ash Mountain
81 - Giant Forest
82 - Lodgepole
83 - Independence
84 - Death Valley

- Selected sites
- Only 1 network through this interface

CalClim

www.calclim.dri.edu

...back to Home Page.

Sample California Cooperative Site: Davis Experimental Farm

Back to:

State Map | Western U.S. map | Home Page

NOTE:
To print data frame (right side), click on right frame before printing.

1971 - 2000

- Daily Temp. & Precip.
- Daily Tabular data (~23 KB)
- Monthly Tabular data (~1 KB)
- NCDC 1971-2000 Normals (~3 KB)

1961 - 1990

- Daily Temp. & Precip.
- Daily Tabular data (~23 KB)
- Monthly Tabular data (~1 KB)
- NCDC 1961-1990 Normals (~3 KB)

Period of Record

- Station Metadata
- Station Metadata Graphics

General Climate Summary Tables

- Temperature
- Precipitation

DAVIS 1 WSW, CALIFORNIA (042294)

Period of Record Monthly Climate Summary

Period of Record : 1/ 4/1917 to 12/31/2004

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	53.5	59.7	65.2	72.2	80.5	88.6	94.1	92.8	88.6	78.9	64.9	54.4	74.4
Average Min. Temperature (F)	36.5	39.6	41.7	44.3	49.0	53.8	55.3	54.1	52.5	47.5	40.6	36.9	46.0
Average Total Precipitation (in.)	3.51	3.34	2.34	1.19	0.46	0.15	0.01	0.03	0.23	0.88	2.05	3.15	17.34
Average Total SnowFall (in.)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Average Snow Depth (in.)	0	0	0	0	0	0	0	0	0	0	0	0	0

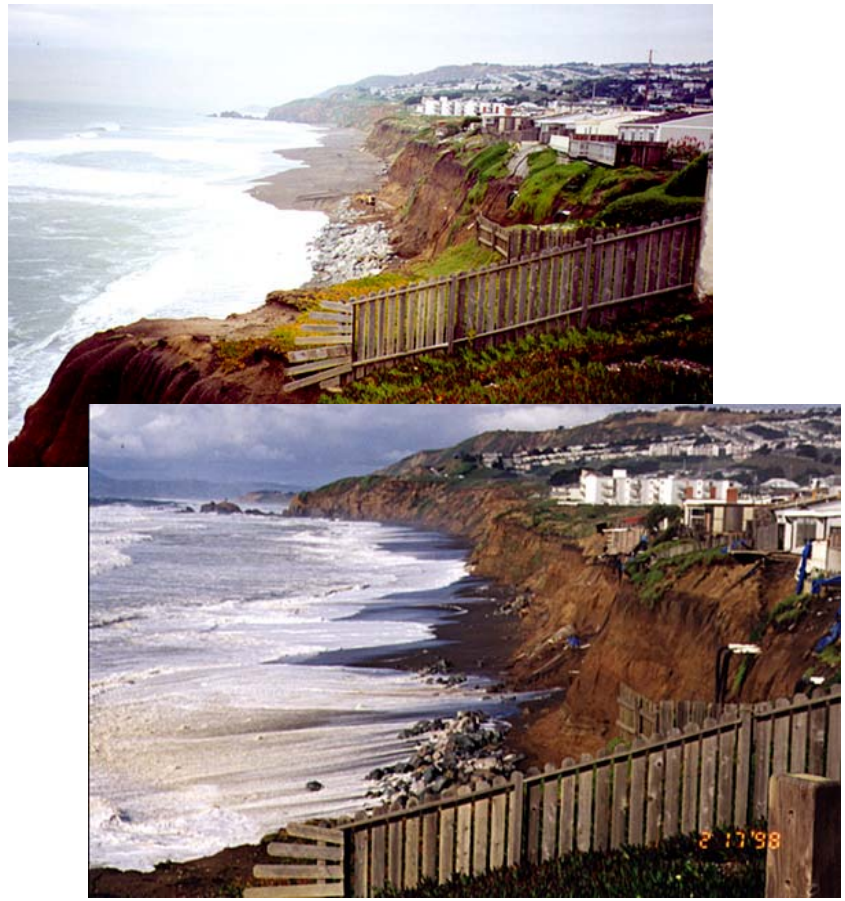
Percent of possible observations for period of record.
Max. Temp.: 99.6% Min. Temp.: 99.5% Precipitation: 99.7% Snowfall: 62.1% Snow Depth: 62%
Check Station Metadata or Metadata graphics for more detail about data completeness.

Western Regional Climate Center, wrcc@dri.edu

www.calclim.dri.edu

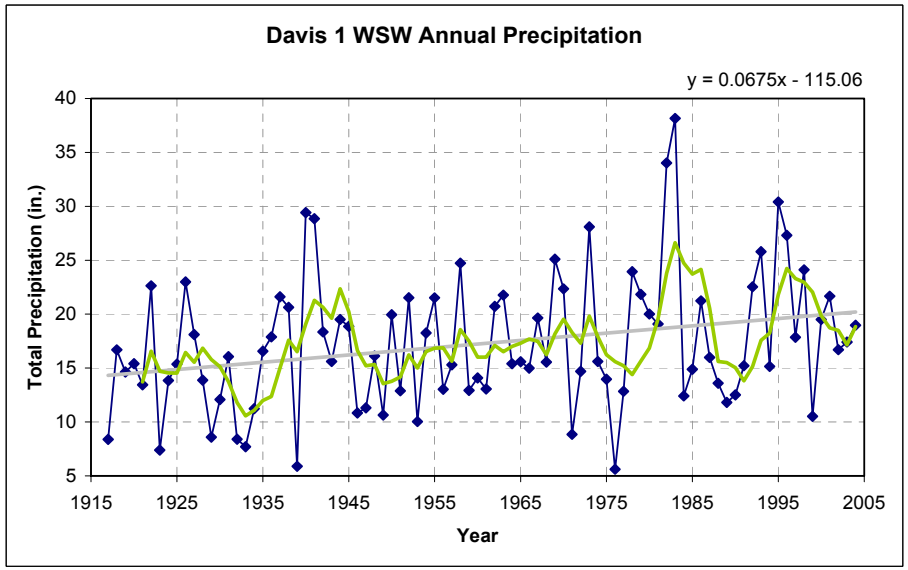
Why is climate change important in California?

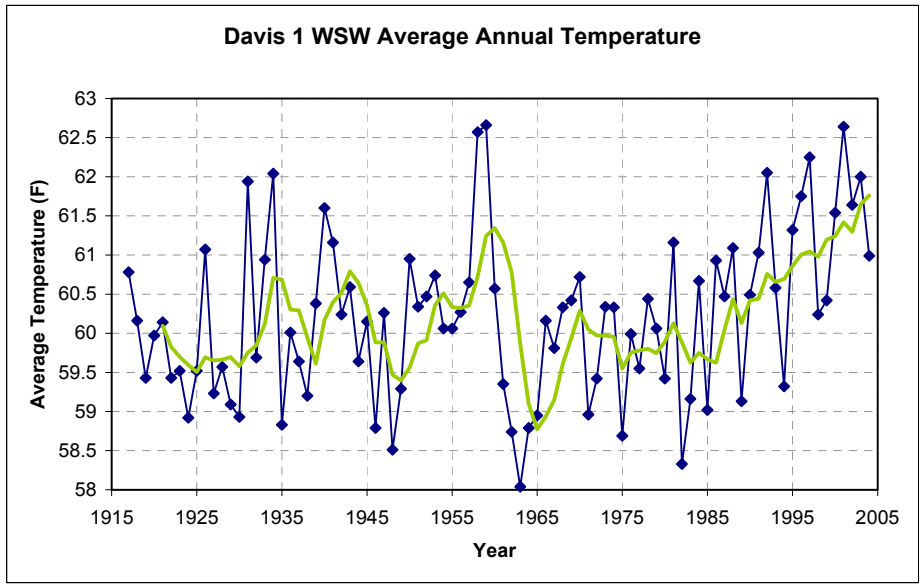
Above: Dana Glacier (3660 m, 37º 54' N, 119º 13' W) in 1883 (left) and 1985 (right)
CREDIT: LEFT, U.S. GEOLOGICAL SURVEY; RIGHT, SCOTT STINE

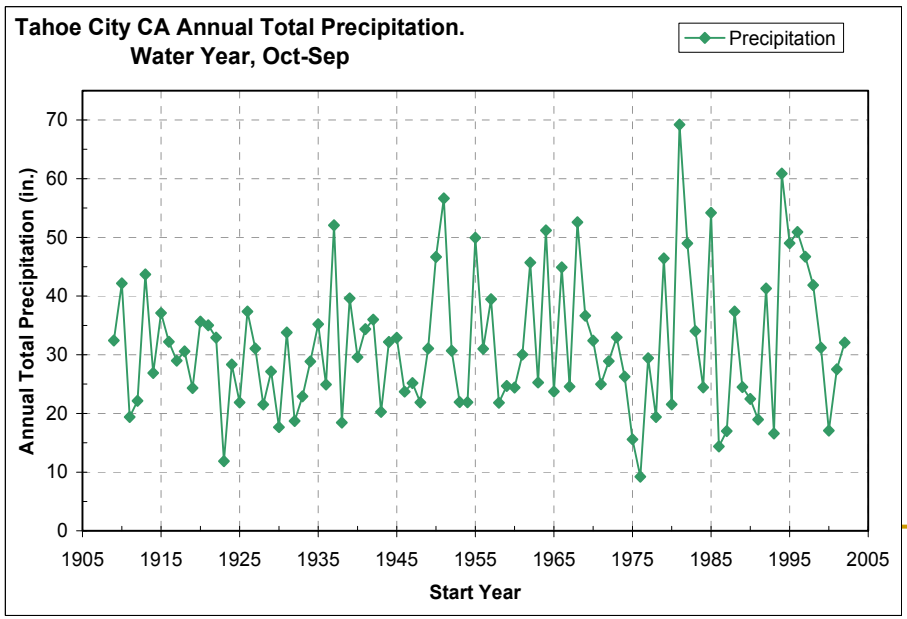


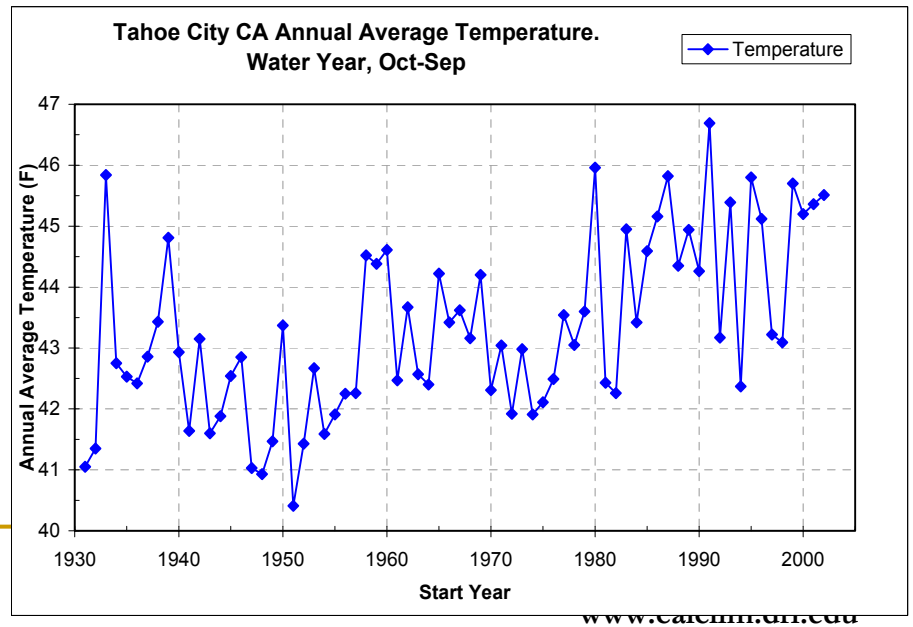
Right: Pacifica, CA coastline, Jan 8, 1998 and Feb 17, 1998.
http://walrus.wr.usgs.gov/elnino/coastal/pacifica.html

What are California's climate trends?





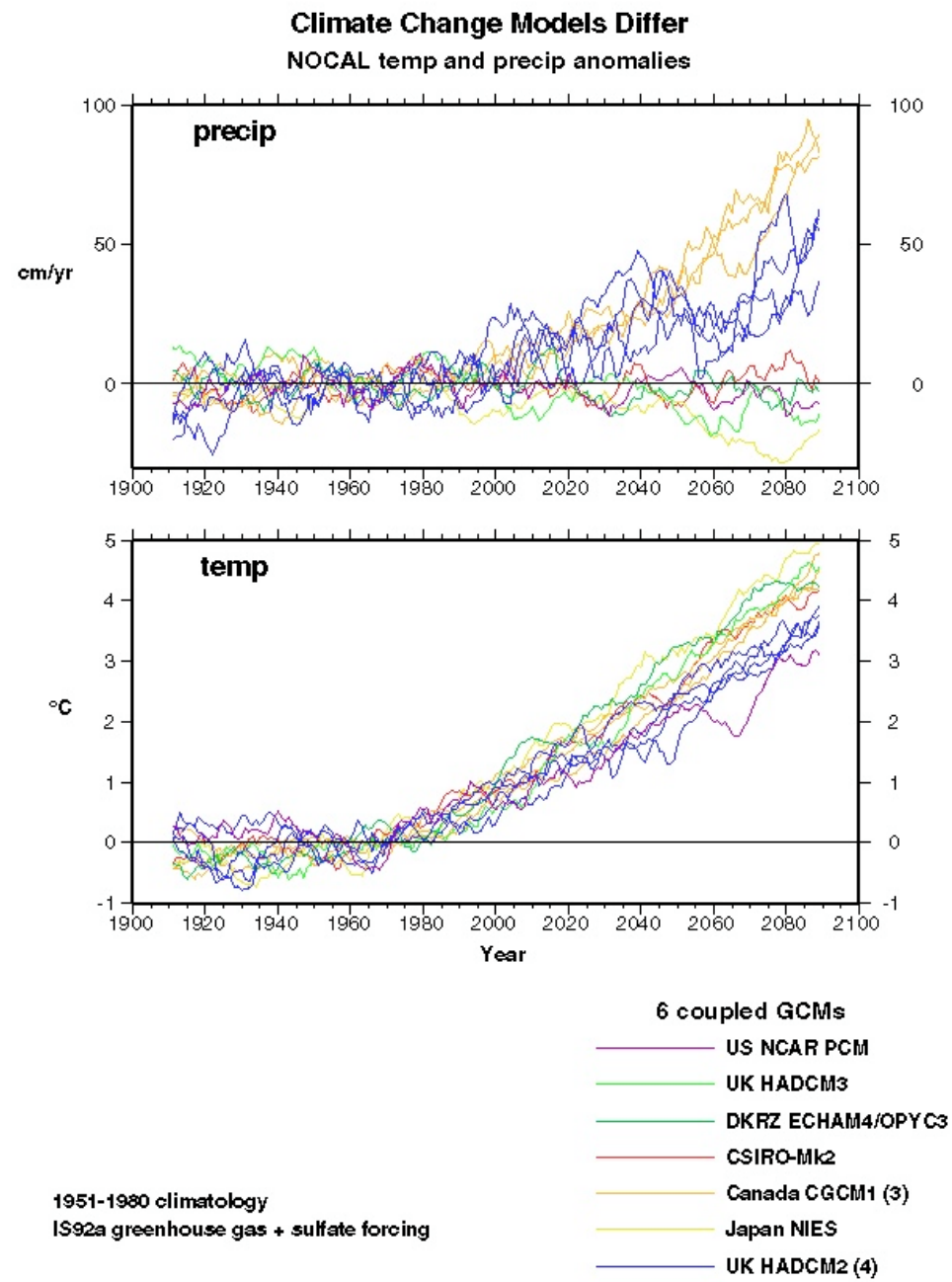




Model Projections

- Northern California
- 6 Models
- 12 results
- 1900-2100

Credit: Mike Dettinger, Scripps/USGS



Model Projections

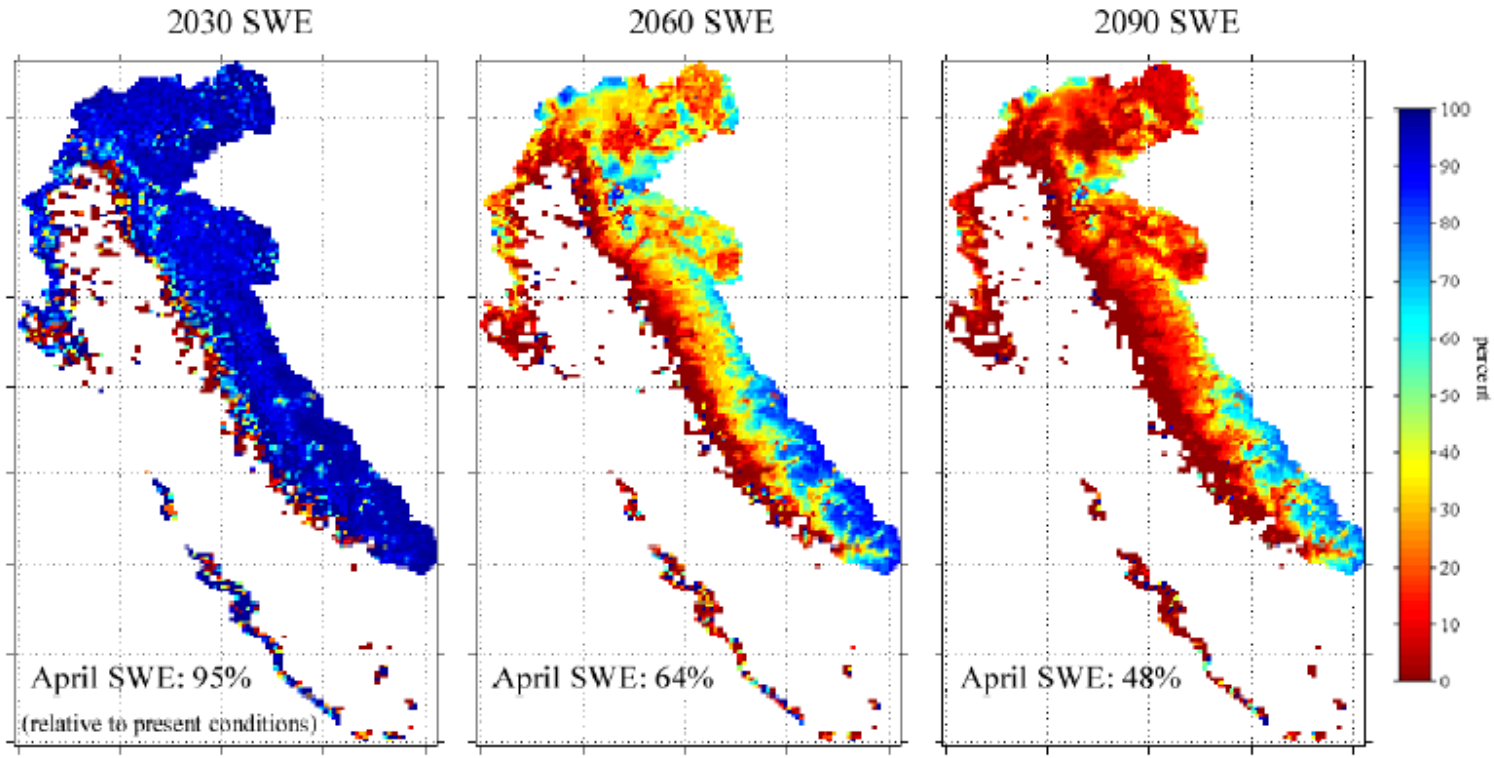


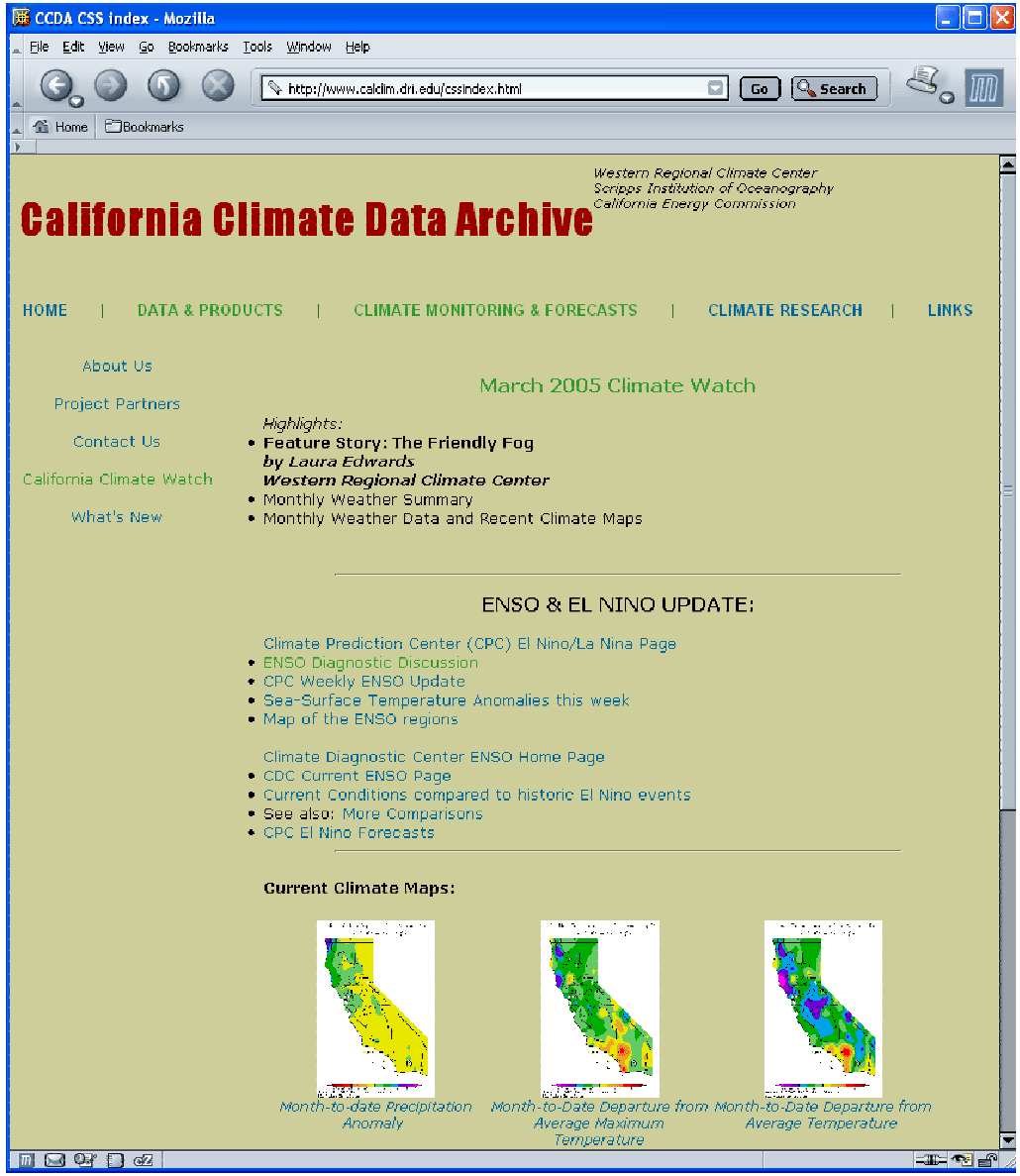
Figure 3. Simulated snow water equivalent (SWE) under a projected temperature increase for the periods 2020-2039, 2050-2069 and 2080-2099, expressed as a percentage of average present conditions.

Potential effects of global warming on the Sacramento / San Joaquin watershed and the San Francisco estuary
Noah Knowles and Dan Cayan, **Climate Research Division, Scripps Institution of Oceanography**

What is CalClim?

www.calclim.dri.edu

- Monitor climate variability and change in California
- Provide a reliable source for climate data and information via California Climate Data Archive (CCDA)
- *California Climate Watch* online newsletter
- Target audience: researchers, govt agencies, public interested in CA climate

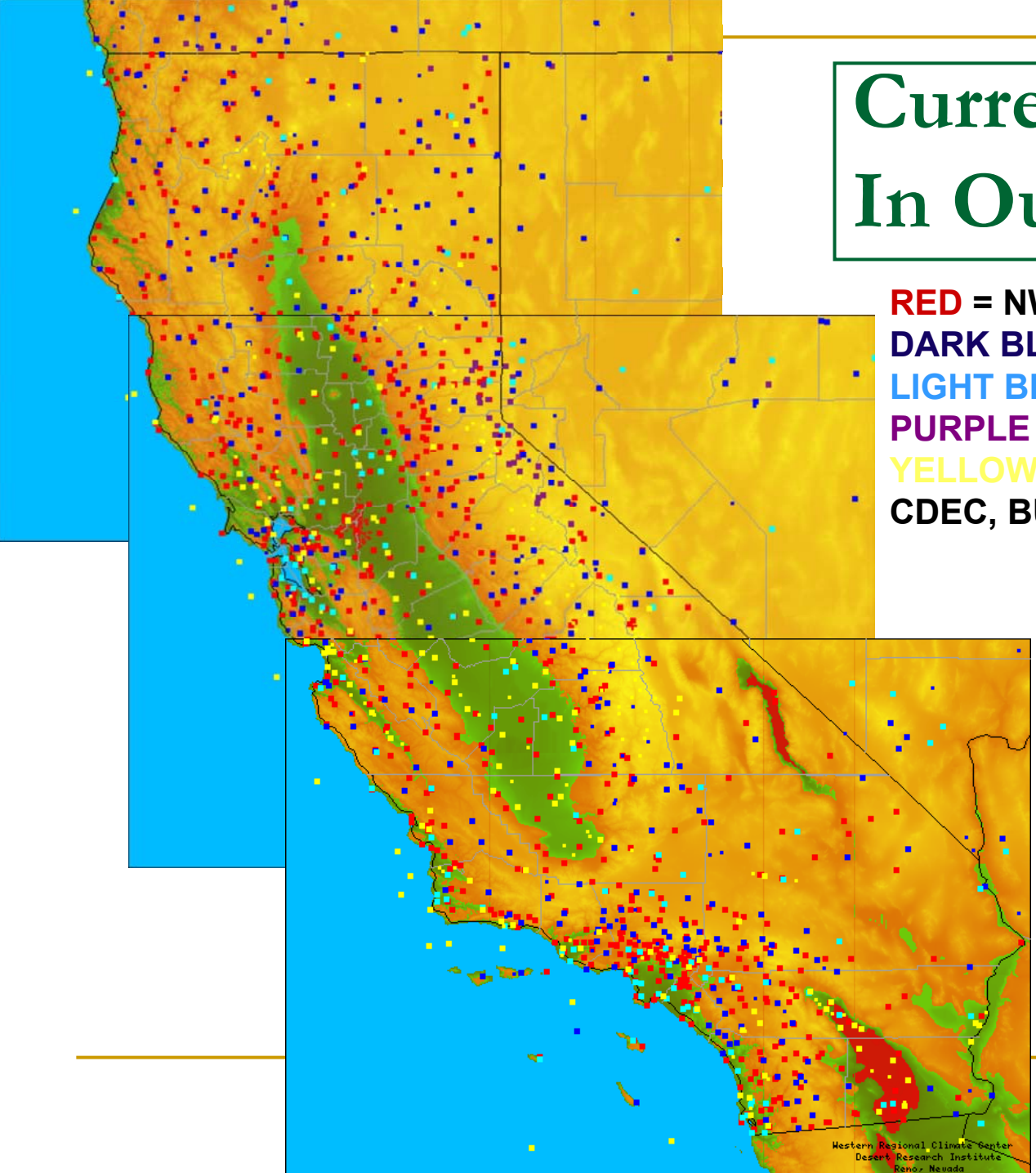


Why do we need CCDA?

Current California climate data sources

- NWS Cooperative (COOP) network:
  daily temp & precip
- Snowpack Telemetry (SNOTEL): snow depth and water content
- Remote Automated Weather Stations (RAWS):
  hourly temps (air, fuel, RH, dew point), wind, precip, solar radiation
- Surface Airways (SAO/METAR):
  hourly observations, mainly airports
- California Data Exchange Center (CDEC):
  includes state Snow Survey sites, time periods vary
- California Irrigation Management Information System (CIMIS):
  Central valley, agriculture-focused network including temps, precip, wind, solar radiation & calculated ET
- NOAA buoys & many small coastal area networks
- California Air Resources Board (CARB), air quality, some met.

Current Stations In Our Archive



RED = NWS Cooperative
DARK BLUE = RAWS
LIGHT BLUE = Surface Airways/METAR
PURPLE = SNOTEL
YELLOW = MISC (CURRENTLY CIMIS, CDEC, BUOYS)

CalClim

www.calclim.dri.edu

Finding Data

Southern California All Networks - Mozilla

File Edit View Go Bookmarks Tools Window Help

Back Forward Reload Stop http://www.calclim.dri.edu/ccda/scaall.html Go Search Print

Home Bookmarks

Western Regional Climate Center
Scripps Institution of Oceanography
California Energy Commission

California Climate Data Archive

HOME | DATA & PRODUCTS | CLIMATE MONITORING & FORECASTS | CLIMATE RESEARCH | LINKS

COMING SOON: Daily COOP Data Download Tool

Data Access & Products

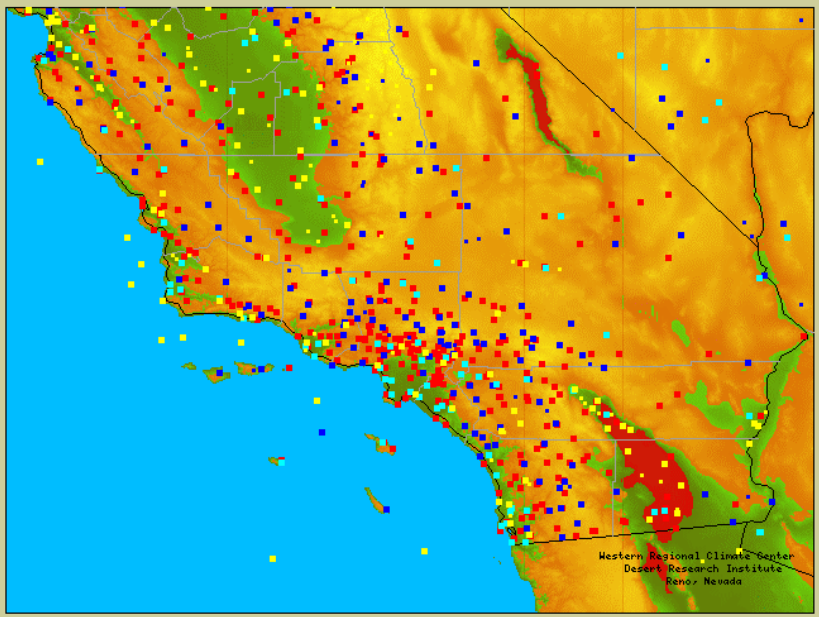
Move cursor over a dot to see the station name and network. Click on a station to view available data and products.

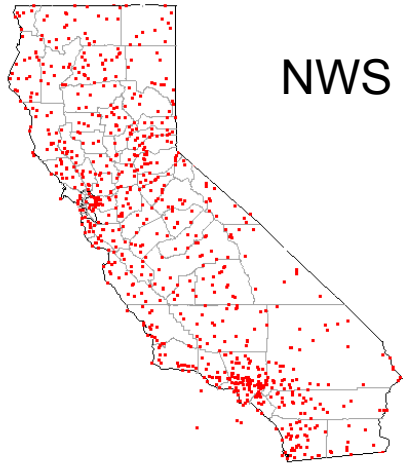
Select a network map to view available stations:

Northern California
- NWS Cooperative (COOP)
- SNOTEL
- RAWS
- Surface Airways (SAO)/METAR
- CIMIS
- CDEC
- NOAA buoys
- All Networks

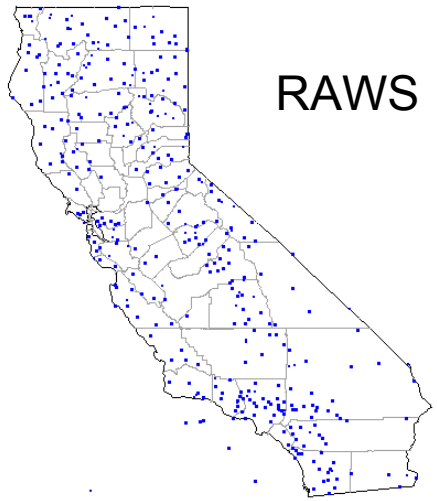
Central California
- NWS Cooperative (COOP)
- SNOTEL
- RAWS
- Surface Airways (SAO)/METAR
- CIMIS
- CDEC
- NOAA buoys
- All Networks

Southern California
- NWS Cooperative (COOP)
- RAWS
- Surface Airways (SAO)/METAR
- CIMIS
- CDEC





NWS Coop

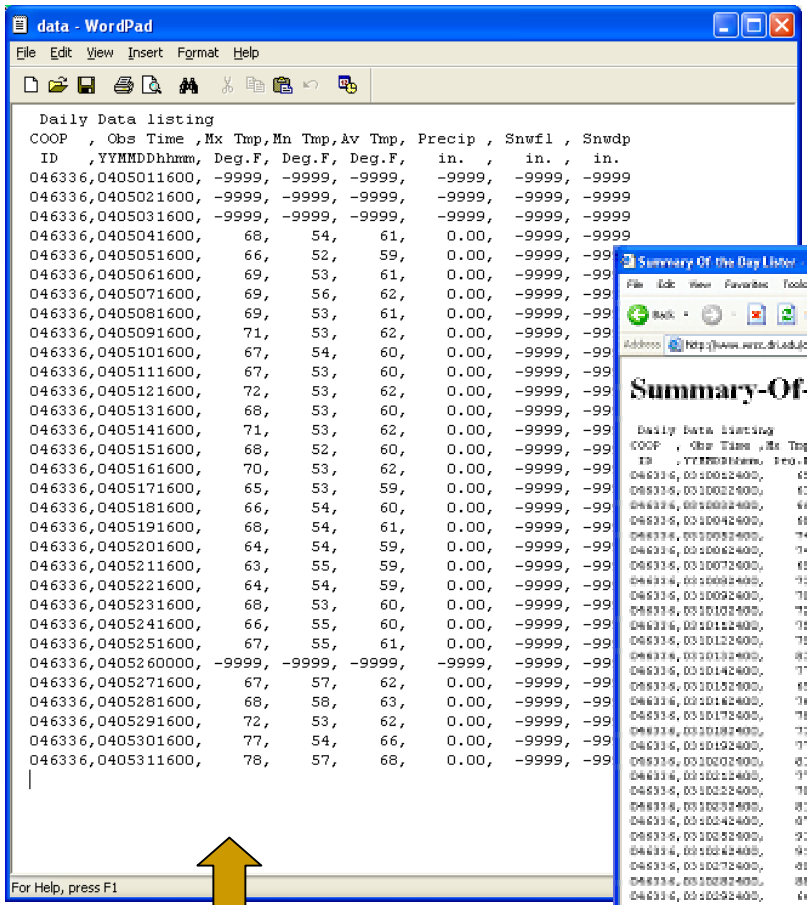


RAWS

CalClim

www.calclim.dri.edu

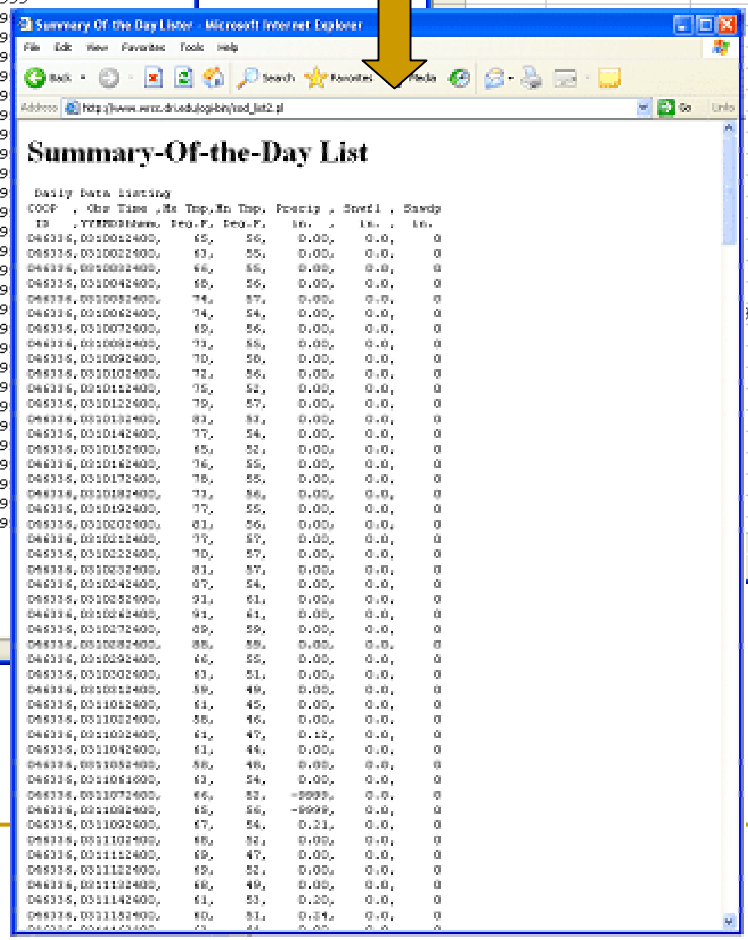
Sample Outputs

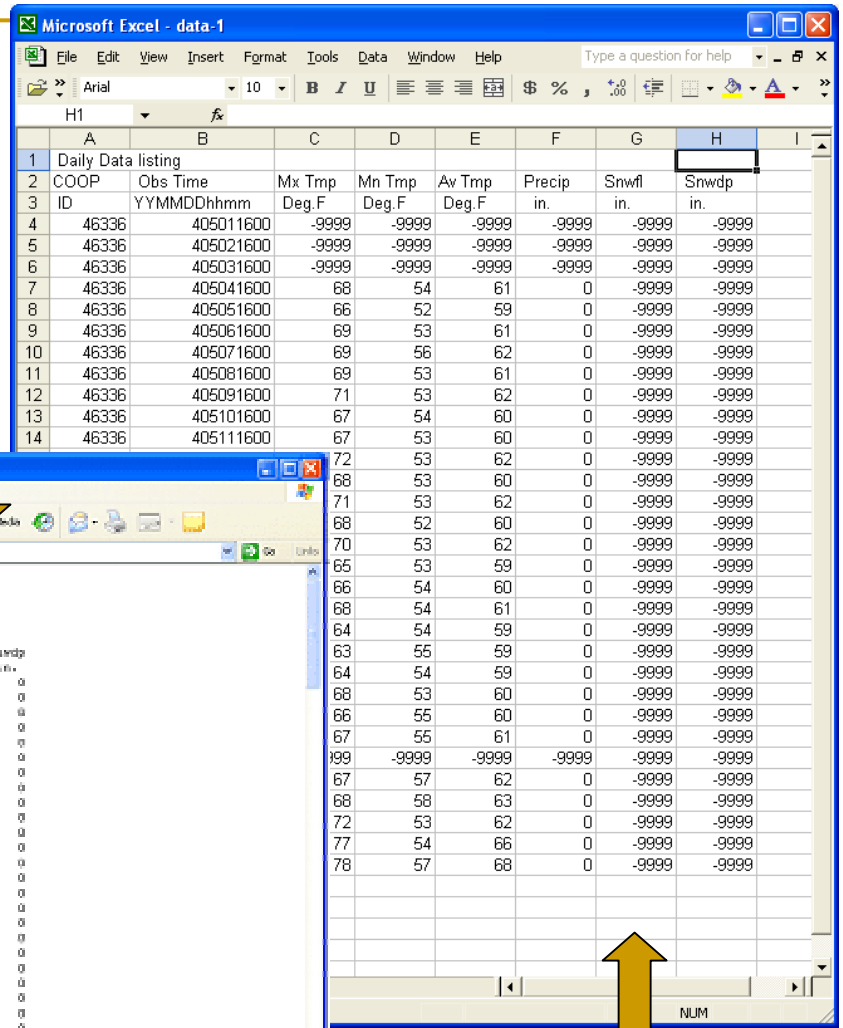



```
 Daily Data listing
COOP   , Obs Time ,Mx Tmp,Mn Tmp,Av Tmp, Precip , Snwfl , Snwdp
 ID    ,YYMMDDhhmm, Deg.F, Deg.F, Deg.F,   in.  ,   in. ,  in.
046336,0405011600, -9999, -9999, -9999,   -9999,  -9999, -9999
046336,0405021600, -9999, -9999, -9999,   -9999,  -9999, -9999
046336,0405031600, -9999, -9999, -9999,   -9999,  -9999, -9999
046336,0405041600,    68,    54,    61,    0.00,  -9999, -9999
046336,0405051600,    66,    52,    59,    0.00,  -9999, -99
046336,0405061600,    69,    53,    61,    0.00,  -9999, -99
046336,0405071600,    69,    56,    62,    0.00,  -9999, -99
046336,0405081600,    69,    53,    61,    0.00,  -9999, -99
046336,0405091600,    71,    53,    62,    0.00,  -9999, -99
046336,0405101600,    67,    54,    60,    0.00,  -9999, -99
046336,0405111600,    67,    53,    60,    0.00,  -9999, -99
046336,0405121600,    72,    53,    62,    0.00,  -9999, -99
046336,0405131600,    68,    53,    60,    0.00,  -9999, -99
046336,0405141600,    71,    53,    62,    0.00,  -9999, -99
046336,0405151600,    68,    52,    60,    0.00,  -9999, -99
046336,0405161600,    70,    53,    62,    0.00,  -9999, -99
046336,0405171600,    65,    53,    59,    0.00,  -9999, -99
046336,0405181600,    66,    54,    60,    0.00,  -9999, -99
046336,0405191600,    68,    54,    61,    0.00,  -9999, -99
046336,0405201600,    64,    54,    59,    0.00,  -9999, -99
046336,0405211600,    63,    55,    59,    0.00,  -9999, -99
046336,0405221600,    64,    54,    59,    0.00,  -9999, -99
046336,0405231600,    68,    53,    60,    0.00,  -9999, -99
046336,0405241600,    66,    55,    60,    0.00,  -9999, -99
046336,0405251600,    67,    55,    61,    0.00,  -9999, -99
046336,0405260000, -9999, -9999, -9999,   -9999,  -9999, -99
046336,0405271600,    67,    57,    62,    0.00,  -9999, -99
046336,0405281600,    68,    58,    63,    0.00,  -9999, -99
046336,0405291600,    72,    53,    62,    0.00,  -9999, -99
046336,0405301600,    77,    54,    66,    0.00,  -9999, -99
046336,0405311600,    78,    57,    68,    0.00,  -9999, -99
```

COMMA-DELIMITED
.dat

HTML





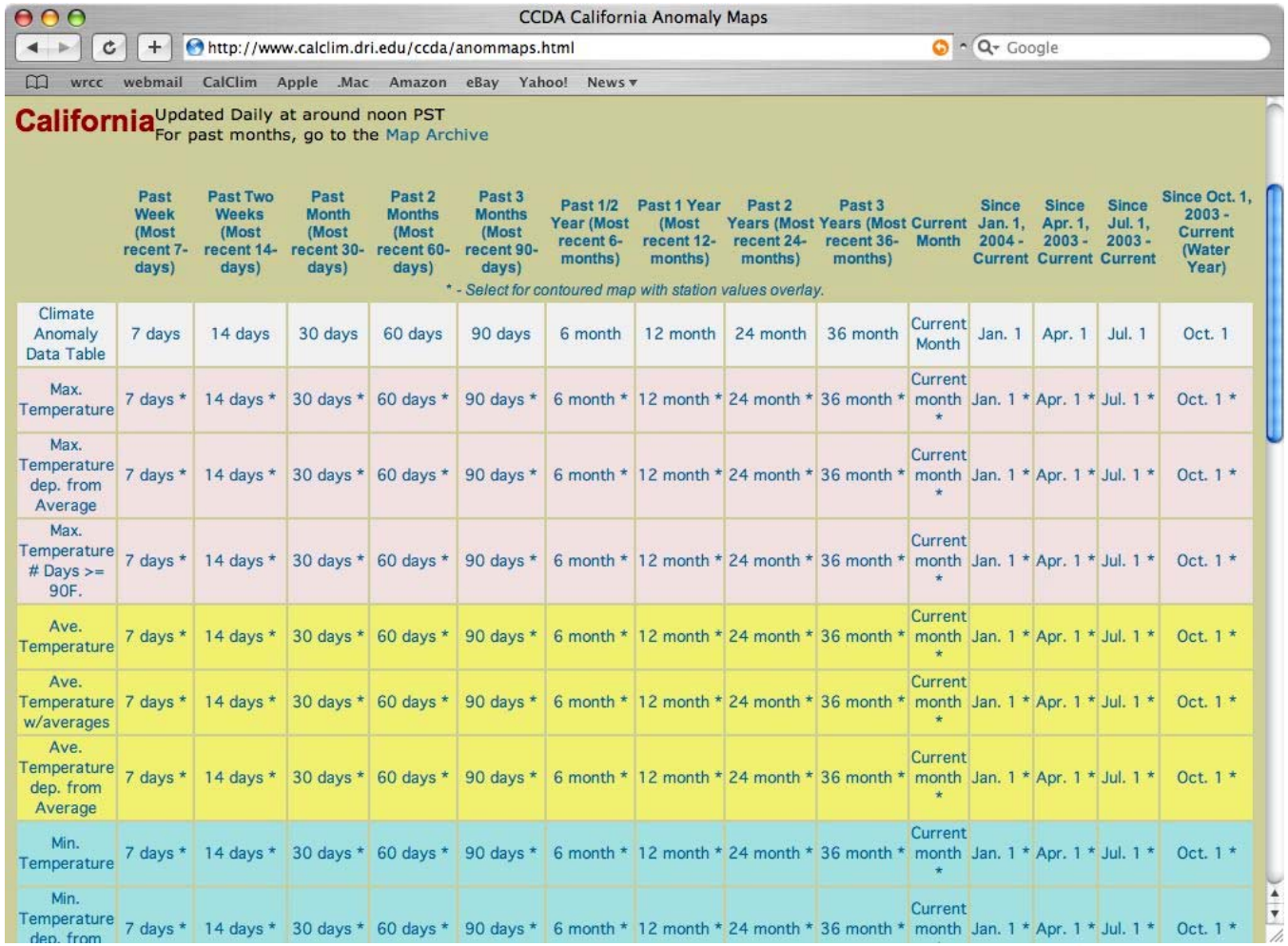
	A	B	C	D	E	F	G	H
1	Daily Data listing							
2	COOP	Obs Time	Mx Tmp	Mn Tmp	Av Tmp	Precip	Snwfl	Snwdp
3	ID	YYMMDDhhmm	Deg.F	Deg.F	Deg.F	in.	in.	in.
4	46336	405011600	-9999	-9999	-9999	-9999	-9999	-9999
5	46336	405021600	-9999	-9999	-9999	-9999	-9999	-9999
6	46336	405031600	-9999	-9999	-9999	-9999	-9999	-9999
7	46336	405041600	68	54	61	0	-9999	-9999
8	46336	405051600	66	52	59	0	-9999	-9999
9	46336	405061600	69	53	61	0	-9999	-9999
10	46336	405071600	69	56	62	0	-9999	-9999
11	46336	405081600	69	53	61	0	-9999	-9999
12	46336	405091600	71	53	62	0	-9999	-9999
13	46336	405101600	67	54	60	0	-9999	-9999
14	46336	405111600	67	53	60	0	-9999	-9999

EXCEL
.xls

CalClim
www.calclim.dri.edu

Other products available online: Recent climate maps

- Periods varying from last 7 days to 3 years
- Includes calendar year, water year and month-to-date
- Temperature, precipitation & degree day elements
- 630 maps for California alone are produced daily
- Maps of past time periods are archived



CCDA California Anomaly Maps

http://www.calclim.dri.edu/ccda/anommaps.html

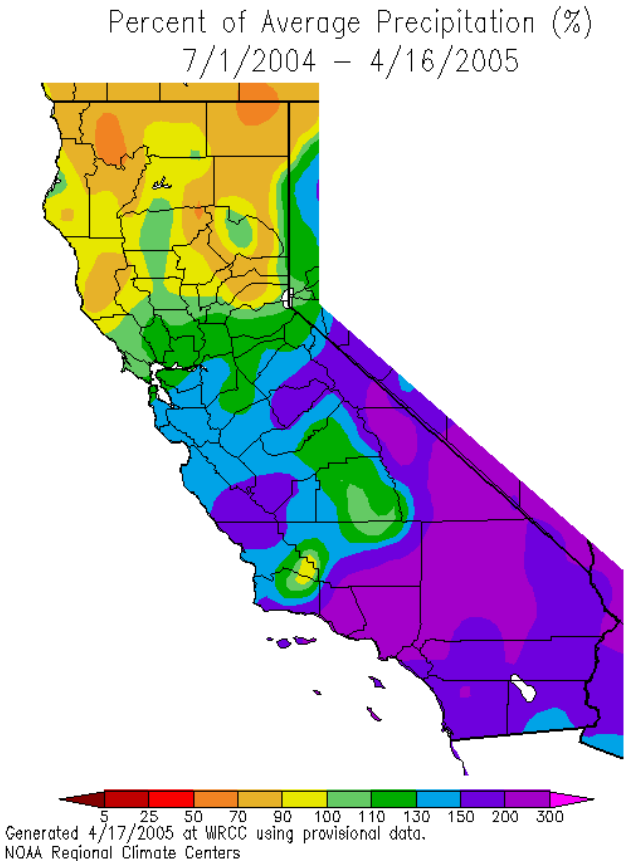
wrcc webmail CalClim Apple .Mac Amazon eBay Yahoo! News

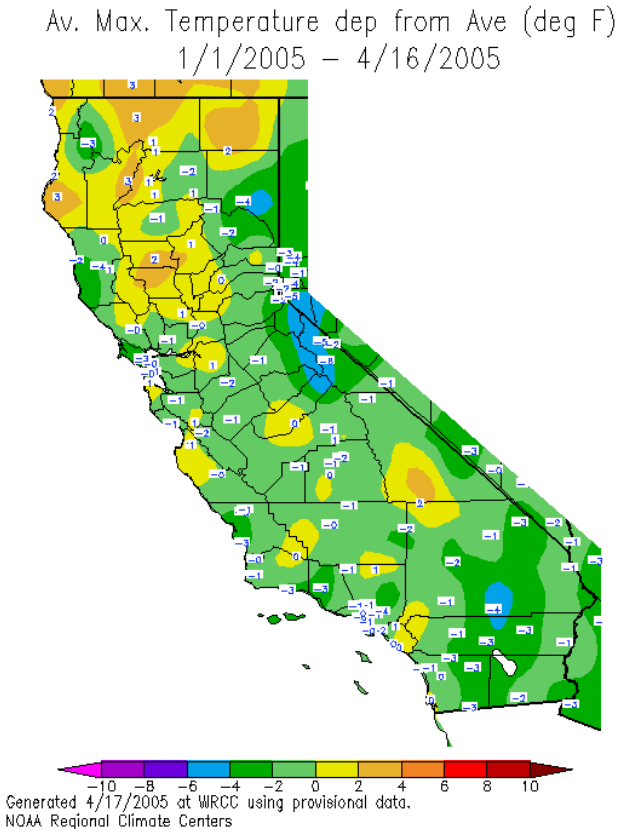
California Updated Daily at around noon PST
For past months, go to the Map Archive

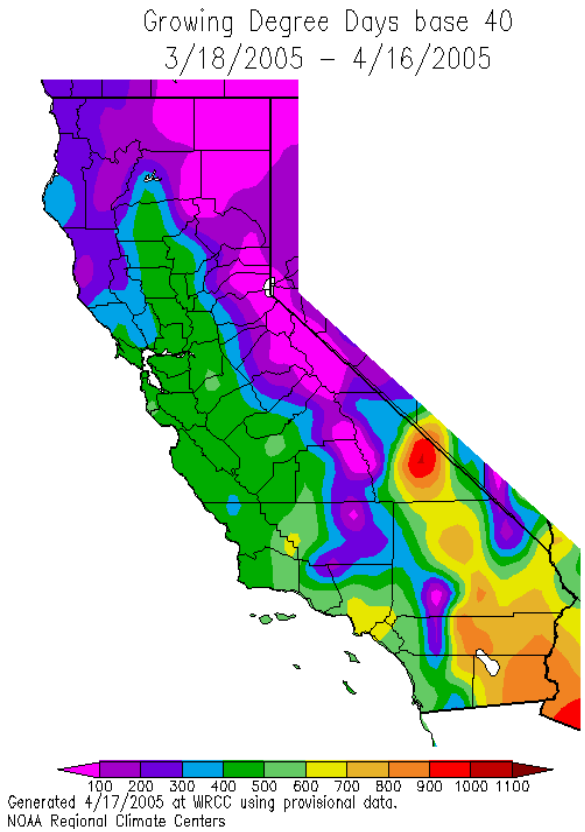
	Past Week (Most recent 7-days)	Past Two Weeks (Most recent 14-days)	Past Month (Most recent 30-days)	Past 2 Months (Most recent 60-days)	Past 3 Months (Most recent 90-days)	Past 1/2 Year (Most recent 6-months)	Past 1 Year (Most recent 12-months)	Past 2 Years (Most recent 24-months)	Past 3 Years (Most recent 36-months)	Current Month	Since Jan. 1, 2004 - Current	Since Apr. 1, 2003 - Current	Since Jul. 1, 2003 - Current	Since Oct. 1, 2003 - Current (Water Year)
* - Select for contoured map with station values overlay.														
Climate Anomaly Data Table	7 days	14 days	30 days	60 days	90 days	6 month	12 month	24 month	36 month	Current Month	Jan. 1	Apr. 1	Jul. 1	Oct. 1
Max. Temperature	7 days *	14 days *	30 days *	60 days *	90 days *	6 month *	12 month *	24 month *	36 month *	Current month *	Jan. 1 *	Apr. 1 *	Jul. 1 *	Oct. 1 *
Max. Temperature dep. from Average	7 days *	14 days *	30 days *	60 days *	90 days *	6 month *	12 month *	24 month *	36 month *	Current month *	Jan. 1 *	Apr. 1 *	Jul. 1 *	Oct. 1 *
Max. Temperature # Days >= 90F.	7 days *	14 days *	30 days *	60 days *	90 days *	6 month *	12 month *	24 month *	36 month *	Current month *	Jan. 1 *	Apr. 1 *	Jul. 1 *	Oct. 1 *
Ave. Temperature	7 days *	14 days *	30 days *	60 days *	90 days *	6 month *	12 month *	24 month *	36 month *	Current month *	Jan. 1 *	Apr. 1 *	Jul. 1 *	Oct. 1 *
Ave. Temperature w/averages	7 days *	14 days *	30 days *	60 days *	90 days *	6 month *	12 month *	24 month *	36 month *	Current month *	Jan. 1 *	Apr. 1 *	Jul. 1 *	Oct. 1 *
Ave. Temperature dep. from Average	7 days *	14 days *	30 days *	60 days *	90 days *	6 month *	12 month *	24 month *	36 month *	Current month *	Jan. 1 *	Apr. 1 *	Jul. 1 *	Oct. 1 *
Min. Temperature	7 days *	14 days *	30 days *	60 days *	90 days *	6 month *	12 month *	24 month *	36 month *	Current month *	Jan. 1 *	Apr. 1 *	Jul. 1 *	Oct. 1 *
Min. Temperature dep. from	7 days *	14 days *	30 days *	60 days *	90 days *	6 month *	12 month *	24 month *	36 month *	Current month	Jan. 1 *	Apr. 1 *	Jul. 1 *	Oct. 1 *

www.calclim.dri.edu/anommaps.html

Recent Climate Maps







California Climate Watch

A monthly newsletter monitoring California climate

California Climate Watch

A monthly newsletter monitoring California climate

March 2005
http://www.calclim.dri.edu

Summary of the Month
by Laura Edwards
Western Regional Climate Center

Editor's Note: I would like to thank Bill Mork for his monthly weather summaries that have been in this column. He will soon be retired and I will be writing the summary for the meantime. Thanks, Bill, for your humor and insight into California weather and climate.

March 2005 proved to be a true spring transition month. It began a little moist, then warm, sunny and dry, and ended wet and a little stormy. The month brought some relief to the precipitation-deprived north and north coastal regions, and some glimmer of hope for the sun lovers around the state.

Overall, March was warmer than normal, with the average temperature 1.4 degrees above the 30-year average. Minimum temperatures contributed to most of this departure, coming in at 2.0 degrees above the 30-year average statewide. Precipitation for California was about 0.40 below average, or about 95% of average. The northern regions fared better than their southern counterparts with 102-147% of average for the month. The three southern regions reported 58-77% of average precipitation. Los Angeles, with its 2.14 inches of rain, is now officially in its second wettest rain year on record.

The first few days of March were wet in the southern coastal region, with record daily precipitation at San Diego Lindbergh airport (1.12 inches) and Ontario airport (0.43 inches) on the 4th. March 9-11 brought a spring-like dry period with warm temperatures, leading up to record highs being set throughout central California. Some record high temperatures on the 9th include San Rafael (77), Sacramento (84), and Mt. Shasta (71).

***WEATHER** continued on page 2.*

Editor: Laura Edwards
DRI/WRCC
2215 Raggio Pkwy
Reno, NV 89512
Laura.Edwards@dri.edu

The Friendly Fog

By Laura Edwards
Western Regional Climate Center

California is known for its sunny skies and warm beaches, but fog along the coast is no stranger to the locals. This region is one of the foggiest locations in the nation, with more than 60 days of dense fog reported on average per year at stations such as Los Angeles, San Diego and Eureka(1). San Francisco has an average of 1066 hours of fog per year and Point Loma near San Diego has 433 hours of fog on average. From Point Reyes to Point Arguello, six lighthouses each average more than 1000 hours per year of fog.

Figure 1. Coastal fog as seen from Trinidad Head lighthouse.. http://www.rudyalicelighthouse.net/CalLts/Trinidad/Trinidad.htm

The sea fog that forms on the California coast and elsewhere around the world has been studied by scores of researchers for over a century (1,2). Worldwide, fog forecasting and climatology has been studied for any number of reasons, including routes for ships such as the *Titanic*, strategic war planning such as on D-Day, as well as commercial and military flight paths.

Sea fog is more common in the warm season (summer), but there is a secondary maximum in the cool season at a number of locations (3). The primary factor contributing to fog formation along the California coast is the atmospheric inversion. This is a stable atmospheric condition where there is little vertical mixing. Inversions occur often with coastal high pressure and low wind speeds, preventing the atmospheric layers from mixing. A second factor is the cool ocean water, upwelled in the California Current region. This is not to say that these are the only factors. Fog has been found to form over warm ocean water as well. The inversion factor is important because the warm, dry air and subsidence (sinking air) trap the moisture evaporating from the ocean. This condition can persist due to radiation reflecting off of the top of the fog that is formed, keeping the cloud cool and preventing evaporation. The fog normally dissipates when a north-northwesterly wind returns, or when a front or low pressure system passes through.

***FOG** continued on page 2.*

INSIDE THIS ISSUE:
Recent Climate Maps, Climate Outlooks

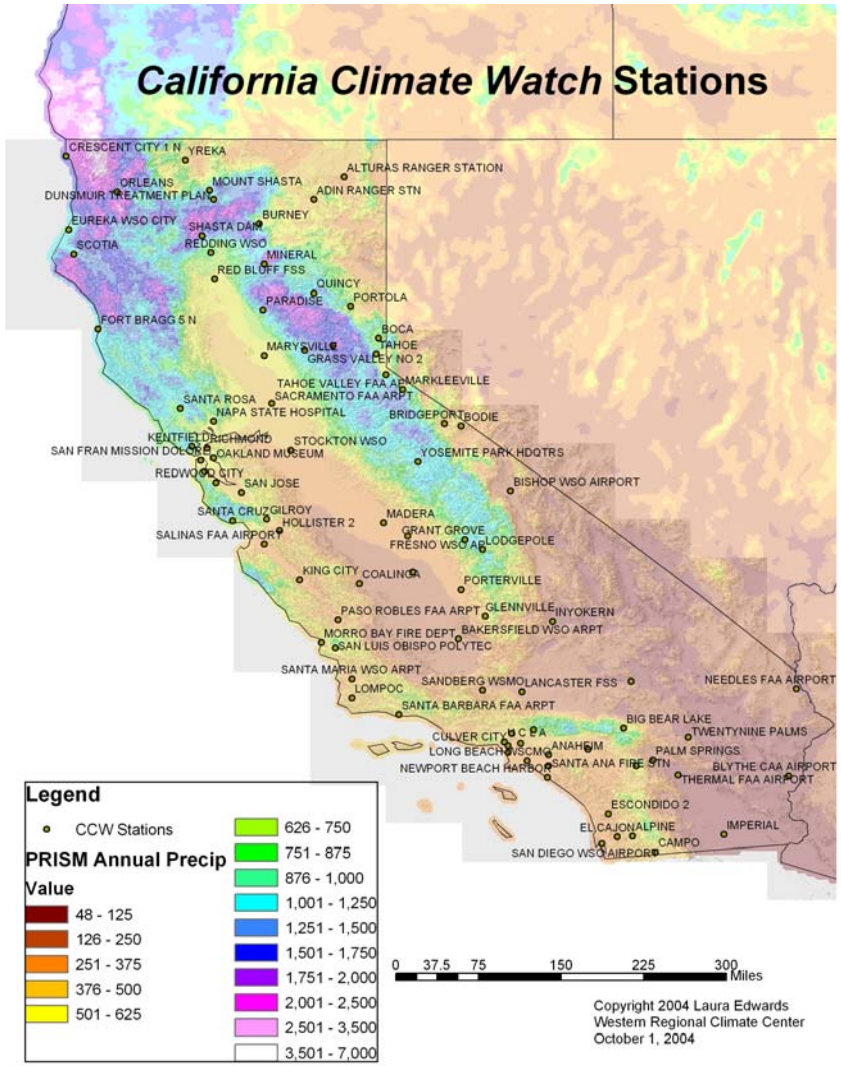
- Monthly online newsletter highlighting recent climate in California
- Purpose: climate monitoring for all audiences
- "Feature story" of a climate research topic, occasional guest writers
- Monthly weather summary
- Station weather data
- Outlooks and forecasts
- Recent climate maps

CalClim

www.calclim.dri.edu

California Climate Watch

A monthly newsletter monitoring California climate



March Station Data

All data is provisional and subject to change.

Climate Division/ Station Name	TA	DA	TX	DX	MGX	XMX	TN	DN	MGN	NMN	PREC	PDEP	PPCT	MGP
North Coast	52.8	2.0	62.8	2.2	0	78	42.7	1.8	0	34	5.95	0.32	102	1
CRESCENT CITY	51.2	3.0	57.7	3.1	0	69	44.8	3.0	0	33	8.46	-0.76	92	0
ARCATA/EUREKA	52.0	2.8	59.2	3.1	0	68	44.8	2.6	0	33	6.24	0.69	112	0
FT BRAGG 5N	50.3	0.0	58.5	0.1	0	68	42.2	0.1	0	34	6.78	0.30	105	0
KENTFIELD	55.8	1.1	65.2	-0.1	0	81	46.3	2.2	0	40	8.28	1.23	117	0
NAPA	56.3	2.0	67.0	1.6	1	85	45.6	2.5	1	37	4.76	0.67	116	1
SANTA ROSA	56.3	1.8	66.7	1.9	0	87	45.9	1.7	0	36	5.73	1.02	122	2
UKIAH AP	54.0	1.9	66.5	2.9	0	88	41.6	0.8	0	34	6.39	0.47	108	0
YREKA	46.1	3.0	61.9	5.0	1	77	30.4	1.2	1	21	0.96	-1.08	47	1
Sacramento Drainage	48.6	2.2	60.1	2.5	2	78	37.2	2.0	2	29	5.08	-0.08	147	2
ALTURAS	39.9	0.8	55.2	2.5	0	74	24.5	-0.8	0	12	1.40	-0.15	90	0
ADIN RANGER STN	43.4	2.0	56.3	3.8	2	78	30.6	0.3	2	22	1.44	-0.46	76	2
BLUE CANYON	41.7	1.9	47.3	0.9	0	66	36.0	3.0	0	26	12.49	1.99	119	0
BURNEY	43.4	2.6	57.4	0.8	1	74	29.4	4.5	1	21	4.70	0.87	123	1
DUNSMUIR TRMT PLT	47.8	3.1	61.6	3.6	3	82	34.0	2.7	3	28	8.09	-1.41	85	3
GRASS VALLEY	49.1	2.7	59.5	2.6	1	80	38.7	2.8	1	31	7.92	-0.60	93	1
MARYSVILLE	55.6	-0.3	67.1	0.3	0	83	44.1	-1.0	0	36	2.59	-0.95	73	0
MINERAL	39.3	3.3	50.4	3.9	6	68	28.2	2.7	6	19	4.39	-4.01	52	6
MOUNT SHASTA	43.9	2.7	55.9	3.8	0	74	31.9	1.6	0	24	6.43	0.62	111	0
PARADISE	56.2	5.2	63.9	3.9	2	83	48.6	6.6	2	40	6.12	-3.21	66	2
PORTOLA	38.4	0.8	50.9	1.4	10	69	26.0	0.4	10	17	2.36	-1.25	65	10
QUINCY	46.1	2.0	60.3	1.5	2	77	31.8	2.5	2	22	6.16	0.57	110	2
REDDING AP	55.5	3.0	66.9	3.0	0	84	44.0	2.9	0	34	4.99	-0.16	97	0
RED BLUFF FSS	55.7	1.5	67.0	2.2	0	84	44.3	0.6	0	35	2.11	-1.55	58	0
SACRAMENTO AP	56.2	1.8	66.8	2.1	0	80	45.6	1.4	0	38	3.30	0.50	118	0
SACRAMENTO CITY	58.8	1.7	69.5	2.5	2	85	48.0	0.9	2	41	3.55	0.40	113	2
SHASTA DAM	55.6	3.2	65.1	3.7	1	85	46.0	2.7	1	39	8.28	7.49	1048	1

3 Criteria for selection:

- **Long history (at least 30 years)**
- **Reliable, quick data availability**
- **Location**

CalClim

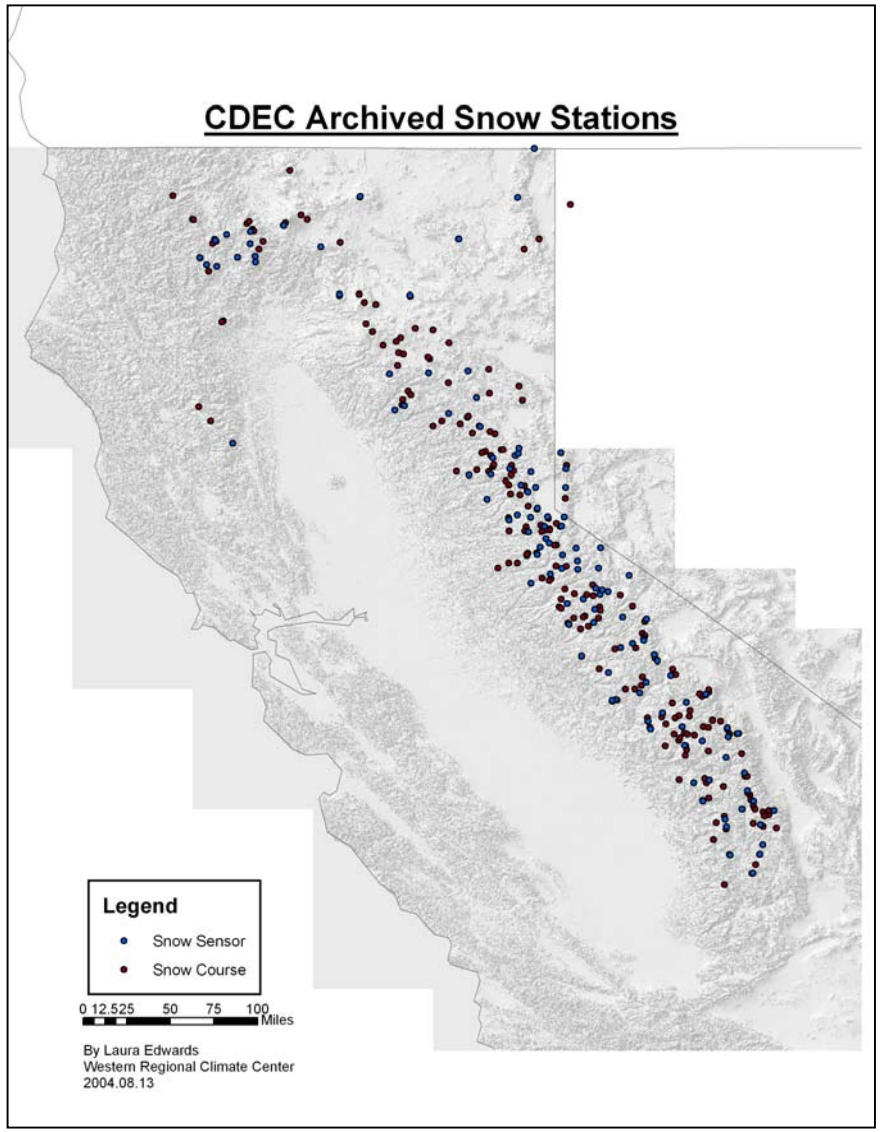
www.calclim.dri.edu

Current CalClim Activities: Metadata Inventory

- Simplify the search for stations
- PostgreSQL
- Queried tables can be easily imported into GIS
- Includes:

  network, operator, location, elevation, variables measured, dates of service, and others

- Down the road capability: make available online


CDEC Archived Snow Stations
Legend
Snow Sensor
Snow Course
0 12.525 50 75 100
Miles
By Laura Edwards
Western Regional Climate Center
2004.08.13

Current CalClim Activities: SNOTEL/California Snow Survey

- Combine these 2 useful, yet independent, data sets
- Provide common output format
- Be able to visualize side-by-side

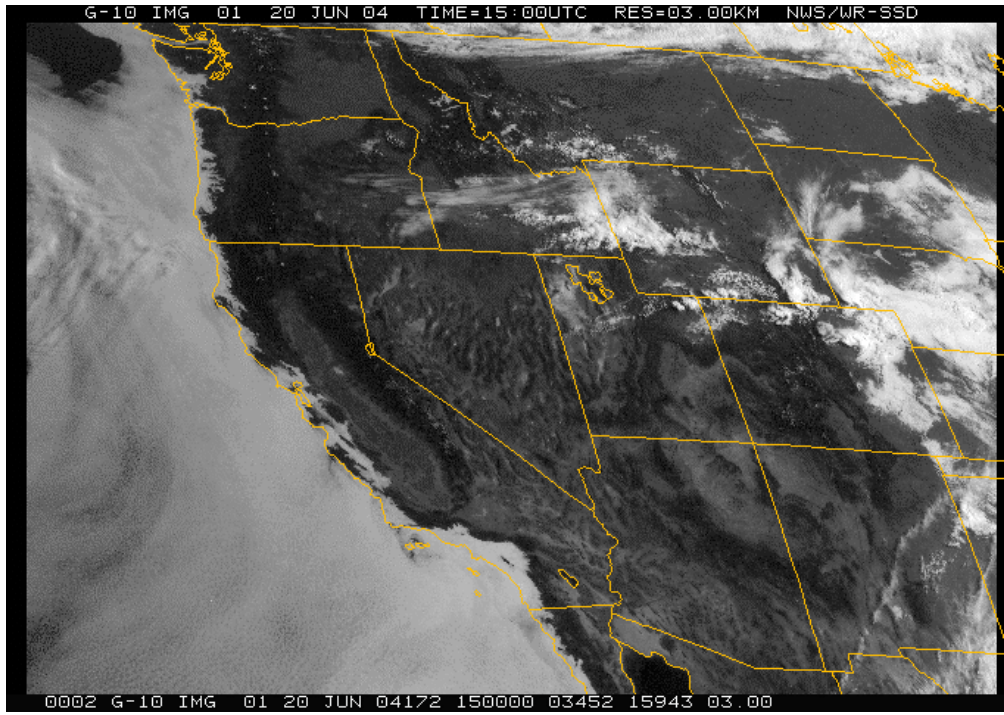
NRCS Natural Resources Conservation Service

+

DEPARTMENT OF WATER RESOURCES STATE OF CALIFORNIA

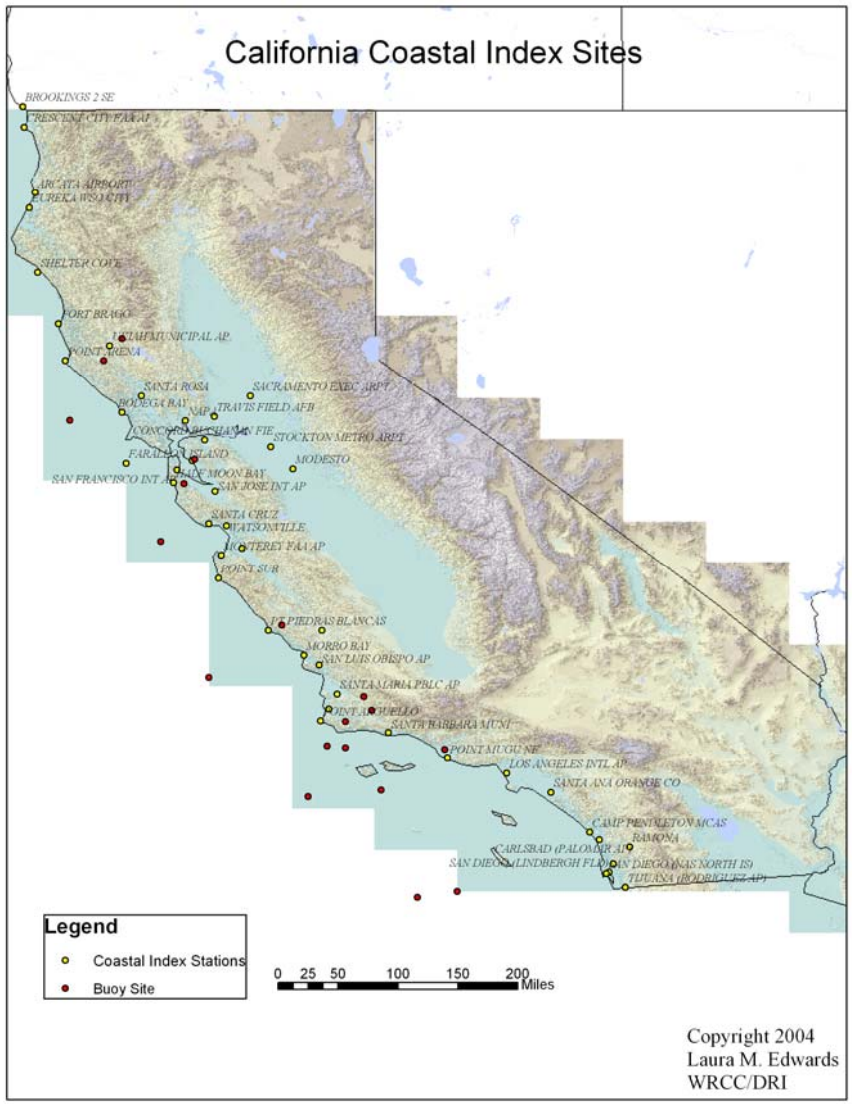
Current CalClim Activities: Coastal Climate Data Archive

- Wide array of data sets, with more variables measured
- Data all over the place, including many smaller research projects
- Energy consumption



Coastal stratus & fog,
20 June 2004, 15Z (8 am local)

Current CalClim Activities: Coastal Climate Data Archive



- Data sets include:

  NOAA buoys, CMAN stations, lighthouses, other offshore observing networks and “special” sites such as Scripps Pier
- Also cooperating with CeNCOOS and other regional IOOS (Integrated Ocean Observing System)

CalClim

www.calclim.dri.edu

Current CalClim Activities: Air Quality Data

- How can these data fit in to a traditionally meteorological database?
- Are we monitoring climate change, or monitoring the factors that cause/influence the climate?
- California is leading the way in air quality and climate monitoring.

Summary

- We have a variety of research activities in California
- WRCC offers a host of data and products online
- But, CalClim and the CCDA are providing "enhanced" climate information for FREE
- We strive for detailed, long-term climate data and information for monitoring and research studies

Now you know what we do…

We're always open to ideas for research & suggestions on how to improve our services

Thank You

- Acknowledgements:
  - Kelly T. Redmond, Greg McCurdy, WRCC
  - Dan Cayan, Mary Tyree, Larry Riddle, Scripps Climate Applications Program
  - Guido Franco, Grant Manager for Public Interest Energy Research (PIER) program, CEC

http://www.calclim.dri.edu

laura.edwards@dri.edu

kelly.redmond@dri.edu