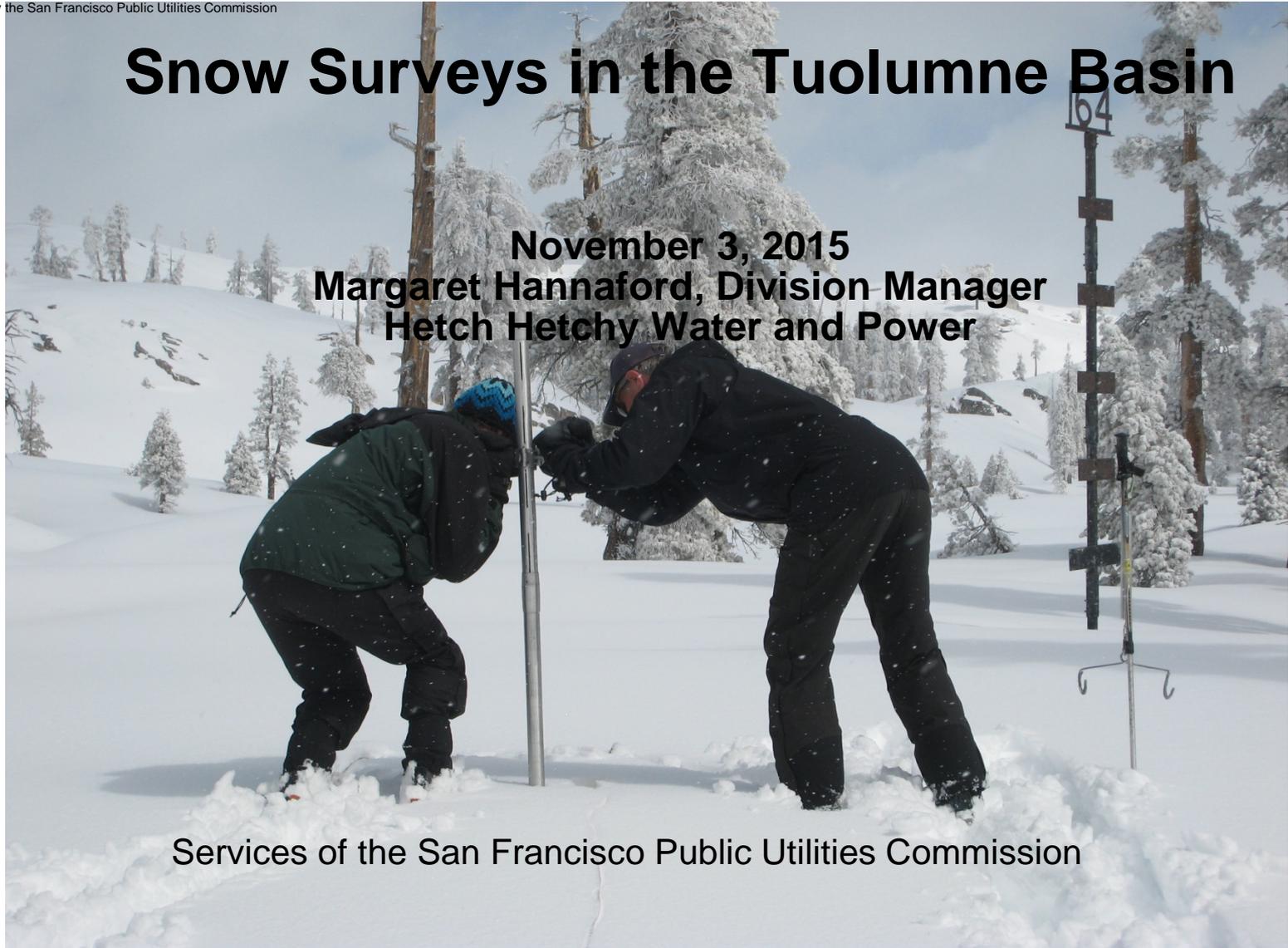


Operated by the San Francisco Public Utilities Commission

Snow Surveys in the Tuolumne Basin

November 3, 2015

**Margaret Hannaford, Division Manager
Hetch Hetchy Water and Power**



Services of the San Francisco Public Utilities Commission

CALIFORNIA COOPERATIVE SNOW SURVEYS

January 30, 1980

City and County of San Francisco
Hetch Hetchy Water and Power
855 Harrison Street, Room 214
San Francisco, CA 94107

Recognition in the form of a Certificate of Appreciation was given during the annual meeting of cooperators, January 17-18, 1980, to those agencies that have been active in the California Cooperative Snow Surveys Program for the last 50 years.

As one of those agencies, it is a pleasure for me to present you with the enclosed framed certificate in appreciation for your continued participation in and support of the snow surveys program.

Sincerely,



A. J. Brown, Coordinator
California Cooperative Snow
Surveys Program

YOSEMITE NATURE NOTES

VOL. VI

MARCH, 1927

NO. 3

YOSEMITE NATURE NOTES

19

WHY ARE SNOW SURVEYS MADE?

By C. P. RUSSELL

Park rangers observe and record the depth of snow in the high levels of Yosemite National Park for the purpose of foretelling roughly what the summer condition of the famous waterfalls of the park are to be and to gain advance information on the approximate dates of the opening of high trails, roads and camping spots.

READING YOSEMITE'S SNOW DEPTH



"Ten and twelve-foot poles, painted white, and graduated in feet and fractions of a foot, set in the ground at strategic points, make it possible to observe and record readily the snow depth throughout the area in question." The gauge pictured above, showing a snow depth of nine feet, is located on the Tioga road just above Cathedral creek. It and others in the area were visited by National Park rangers March 18 to 22, 1927.

SAN FRANCISCO PUBLIC UTILITIES COMMISSION
HETCH HETCHY WATER SUPPLY



MEMORANDUM TO: J. H. TURNER, Chief Engineer and Manager

SUBJECT: Reconnaissance trip in the upper reaches of the Tuolumne River watershed in connection with the California Cooperative Snow Surveys

This trip was made during the period July 24 to August 1, 1944, inclusive, and was for the purpose of locating suitable sites for snow survey courses and routes to be followed by the men, traveling on skis, who will make the snow surveys during the winter months. Locations were also made for shelters to be used by these men at the end of each day's schedule.

Consideration was also given to the various natural lakes and meadows encountered as possible reservoir areas.

The party consisted of the following:

Fred Paget, Associate Engineer in charge of California
Cooperative Snow Surveys, Division of Water
Resources, Sacramento, California
Frank Givens, District Ranger, Yosemite National Park,
Mather, California
John H. Ryan, Construction Engineer, Hetch Hetchy Water Supply
Mather, California
Harry E. Lloyd, Construction Engineer, Hetch Hetchy Water Supply
San Francisco, California
Allen Haigh, Wrangler and owner of live stock
Coulterville, California
Eugene Faines, Camp Cook
Coulterville, California







CALIFORNIA COOPERATIVE SNOW SURVEYS

Mr. Harry Lloyd, Construction Engineer
Cherry Creek Project
Public Utilities Commission
425 Mason Street
San Francisco, California

Dear Mr. Lloyd:

The frost on the grass and the ice in the water bucket at the higher mountain camps these mornings are a definite warning that winter is not far off, and as an aftermath of our conversation yesterday it is believed that a resume of the present status and future plans for this winter's snow survey work in the Jack Main - Cherry Valley area would be in order.

Snow Courses

Snow courses are now laid out along this circuit as follows:

Beehive Meadow
Vernon Lake
Paradise Valley
Wilmer Lake
Grace Meadow

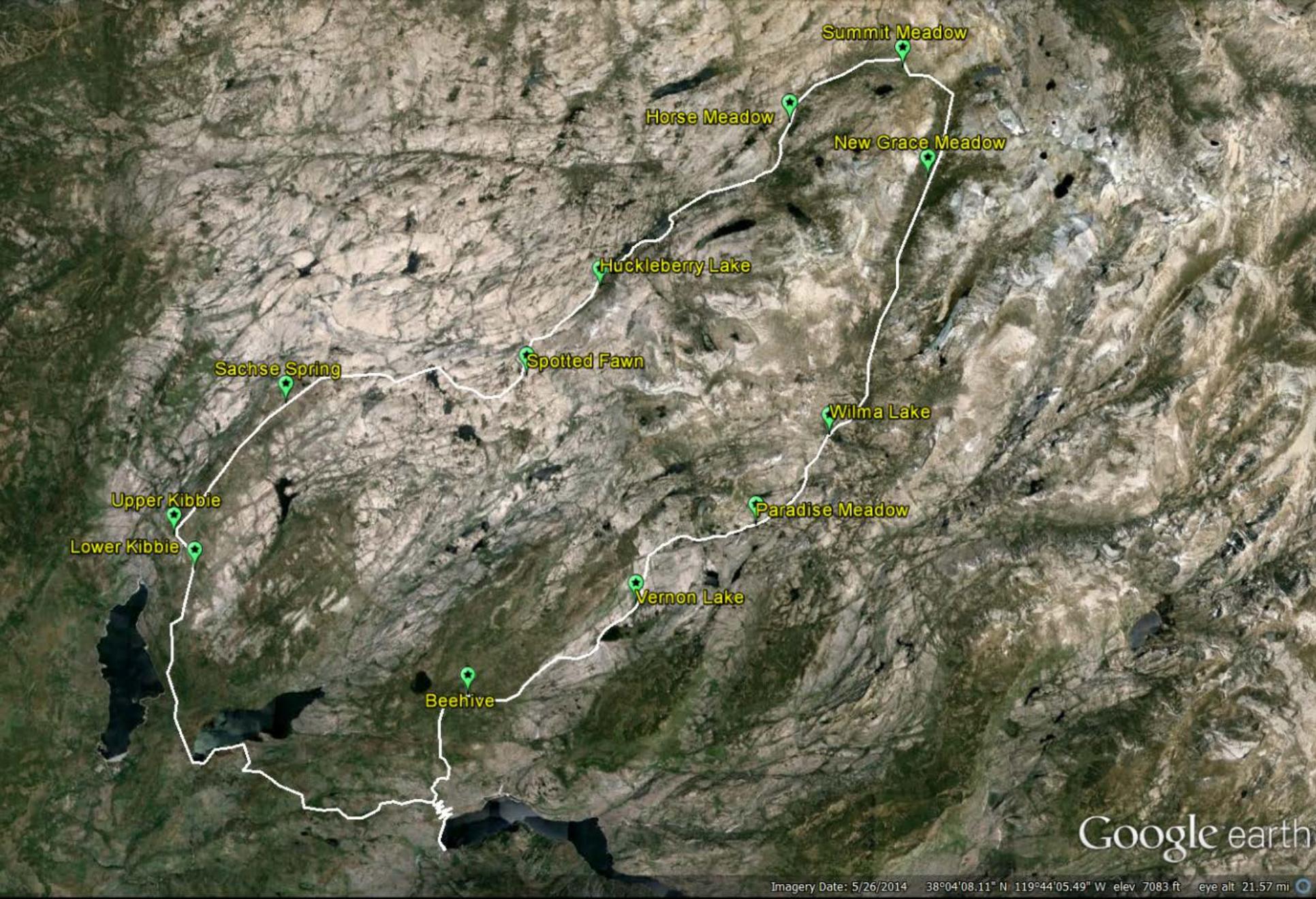
Pond Pass
Horse Meadows
Huckleberry Lake
Upper Kibby Ridge
Lower Kibby Ridge

RECEIVED
SEP 8 1947
H. E. LLOYD

Two snow courses remain to be laid out, one near the cabin at Saxen Springs and the other in the higher country somewhere between Saxen Springs and Huckleberry Lake.

Shelter Cabins

This summer the three shelter cabins necessary to complete the circuit have been completed, or almost so. The cabin at Saxen Springs was completed in July. The cabin at Bond Pass was completed in August. The repair work necessary to make the Huckleberry cabin suitable for habitation is now being done and should be completed shortly.



Google earth

Imagery Date: 5/26/2014 38°04'08.11" N 119°44'05.49" W elev 7083 ft eye alt 21.57 mi





Then





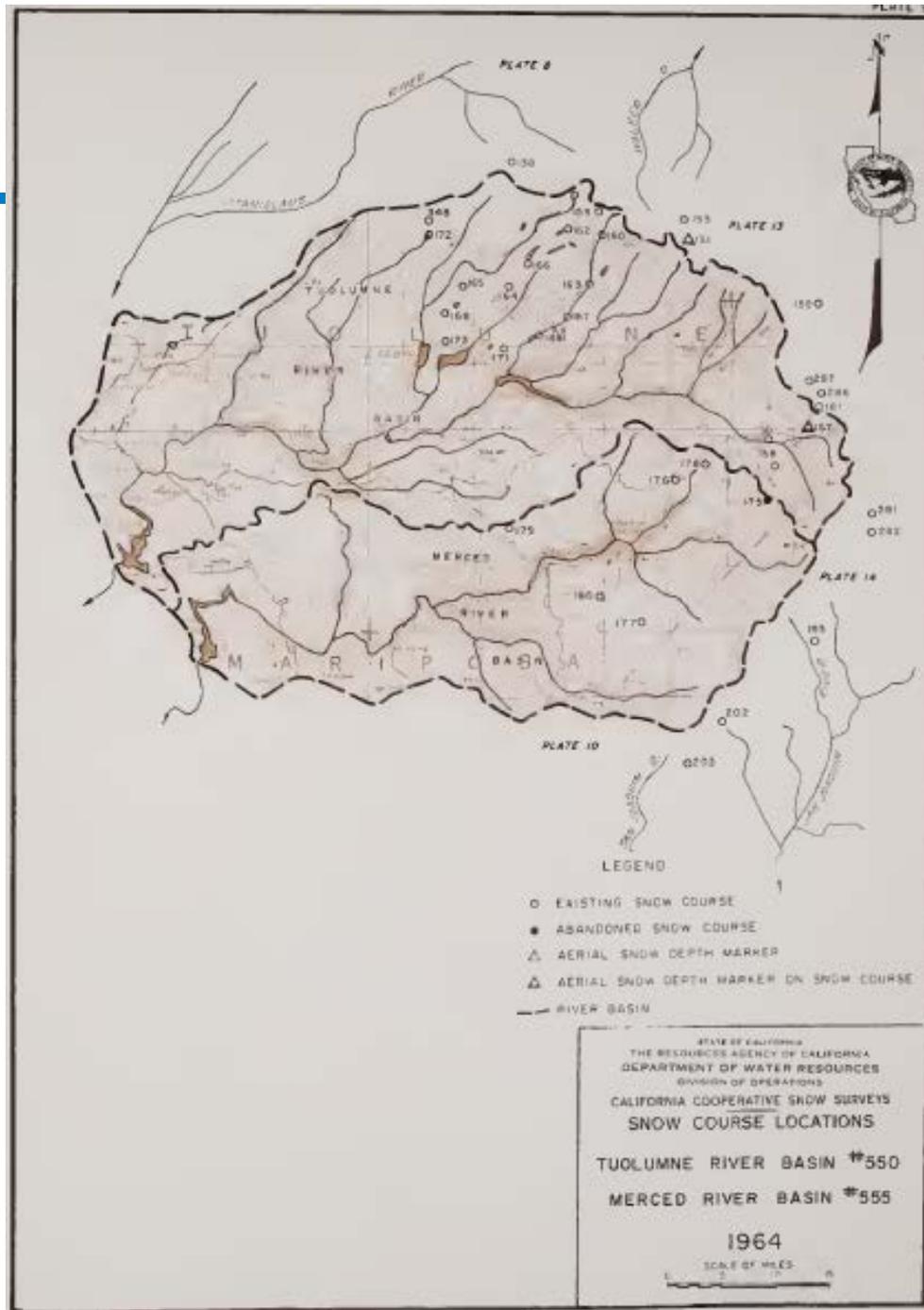
& Now!

BASIN AND SNOW COURSE	CALIF NUMBER	ELEV IN FEET	RECORD BEGAN	AVG APR 1 WC %
TUOLUMNE RIVER				
DANA MEADOWS	157	9850	1926	30.2
RAFFERTY MEADOWS	158	9400	1948	31.0
BOND PASS	159	9300	1948	44.1
GRACE MEADOW	160	8900	1947	38.9
TUOLUMNE MEADOWS	161	8600	1930	22.8
HORSE MEADOW	162	8400	1948	46.5
WILMER LAKE	163	8000	1946	43.8
SACHSE SPRINGS	165	7900	1948	39.5
SPOTTED FAWN	164	7800	1948	47.2
HUCKLEBERRY LAKE	166	7800	1948	43.2
PARADISE	167	7700	1946	41.4
UPPER KIBBIE RIDGE	168	6700	1937	21.2
VERNON LAKE	169	6700	1947	26.0
LOWER KIBBIE RIDGE	173	6700	1937	27.8
BEEHIVE MEADOW	171	6500	1930	27.8
BELL MEADOW	172	6500	1937	19.7



Ralph Anderson

Snow surveyors at Dana Meadows, near Tioga Pass, weighing tube containing core of snow.



John C. Preston, Superintendent

D. E. McHenry, Park Naturalist

D. H. Hubbard, Assoc. Park Naturalist

N. B. Herkenham, Asst. Park Naturalist

W. W. Bryant, Junior Park Naturalist

VOL. XXXII

JANUARY 1953

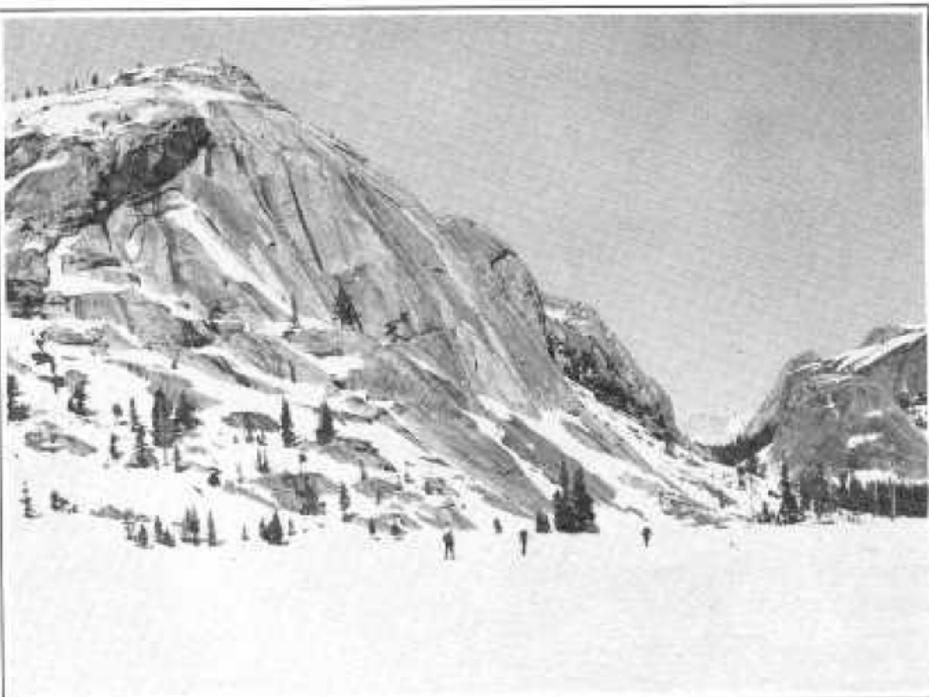
NO. 1

SNOW SURVEYING

At this point one may well ask:

Why the excitement over a little snow in the mountains, or the lack of it—who cares? What are these snow

ple and direct. Water stored in the snows that fall over California's mountains is the lifeblood of the State. Without it, there would be no irrigation for valley crops, no water to spin the great wheels of hydro-electric plants generating power to run our factories and light our homes—no, not even water to drink in many of the large cities. Acreages for crops that require heavy irrigation will be determined by forecasts, based on these surveys, of how much water will be available.



Ralph Anderson

Snow surveyors crossing Tenaya Lake on skis.

Aerial Markers





HETCH HETCHY WATER AND POWER

BUREAU OF LIGHT, HEAT AND POWER

693 VERMONT STREET
SAN FRANCISCO, CALIFORNIA 94107
558-3038



August 2, 1983

Subject: Discontinuance of Aerial Markers

Mr. Jack Pardee, Coordinator
California Cooperative Snow Surveys Program
California Department of Water Resources
P.O. Box 388
Sacramento, California 95802

Dear Mr. Pardee:

This department finds it deeply disturbing that you are considering the discontinuance of observing aerial markers during 1984. We are totally dependent upon aerial markers to provide us with meaningful snow depth measurements for the Tuolumne River watershed for the February 1, March 1, and May 1 readings. If necessary, the City will make its own arrangements to read these markers. Under no circumstances do we wish to see these aerial markers removed.

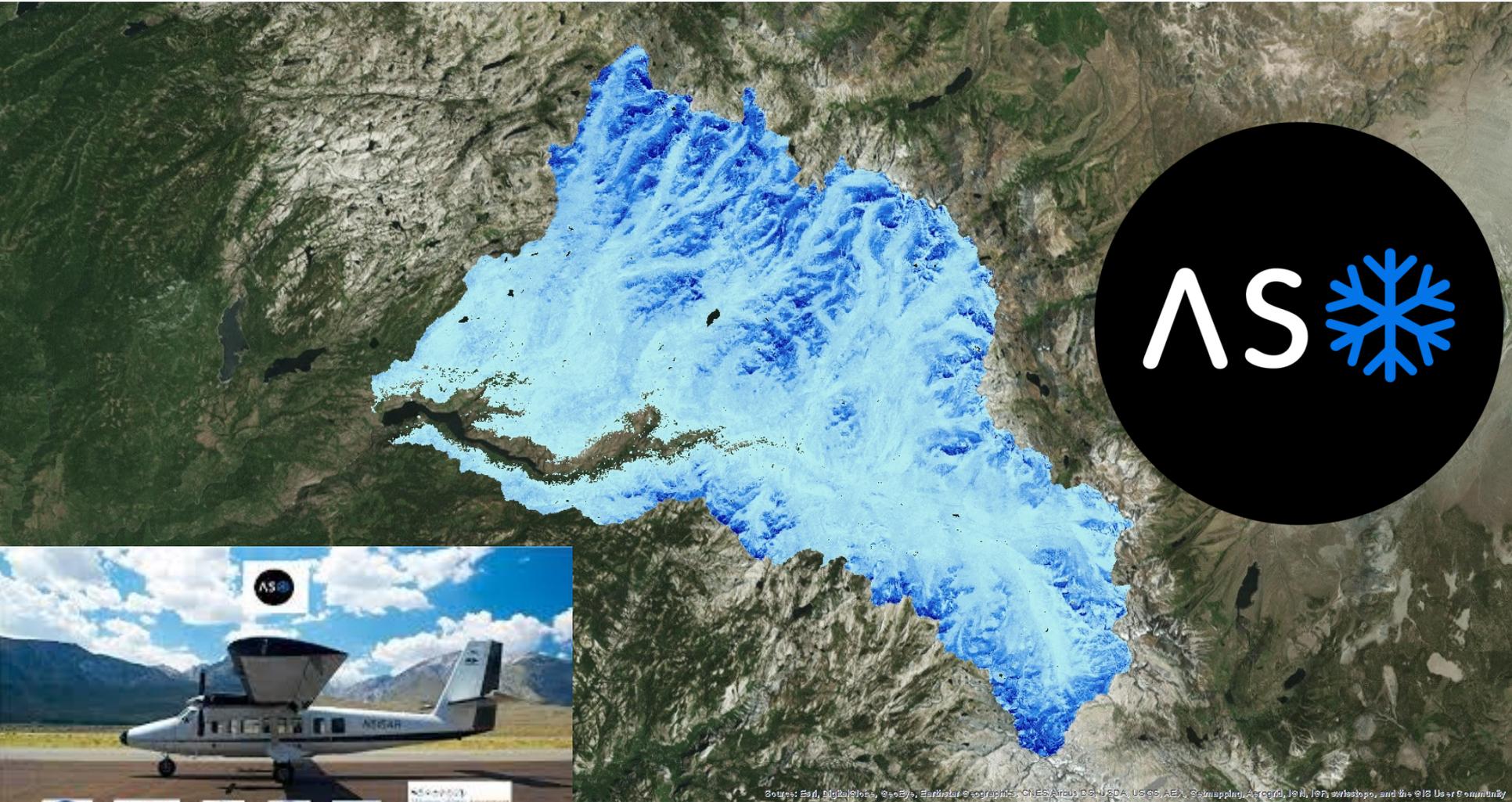
We know it is your policy, along with the National Forest Service and the National Park Service, to eventually replace all snow measurement devices in wilderness areas with snow sensors located outside such areas. Based on the experiences we have had with snow sensors the past three seasons, we hope that you, and the other various agencies concerned with this policy, will reconsider the policy outlined in the U.S. Forest Service's letter of January 11, 1982. Considering that the Lake Eleanor and Hetch Hetchy Reservoir watersheds are located in their entirety within Yosemite National Park and that 95 percent of the Lake Lloyd watershed is within the Emigrant Wilderness Area, we are skeptical that this policy will provide us with accurate and meaningful readings. There are no sites above 6500 feet elevation on these watersheds that are not either in the Emigrant Wilderness or in Yosemite Park. We can't imagine where there are suitable locations where an accurate correlation can be made to reflect the actual conditions on our watershed. To pursue this policy in the case of the Tuolumne could be shortsighted and foolish. And to remove the existing aerial markers, as was already done at Dana Meadows, is unacceptable to us at this time.

Snow Sensors – as early as 1980



Continued support of manual surveys





Sources: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroV, Swmap, AeroGRID, IGN, IFA, swisstopo, and the © 2012 Usr Community

Hannaford Snow Survey Heritage



Jack Hannaford (left) at Loon Lake, 9 March 1960, with Bob Miller and Pilot Harry Rogers

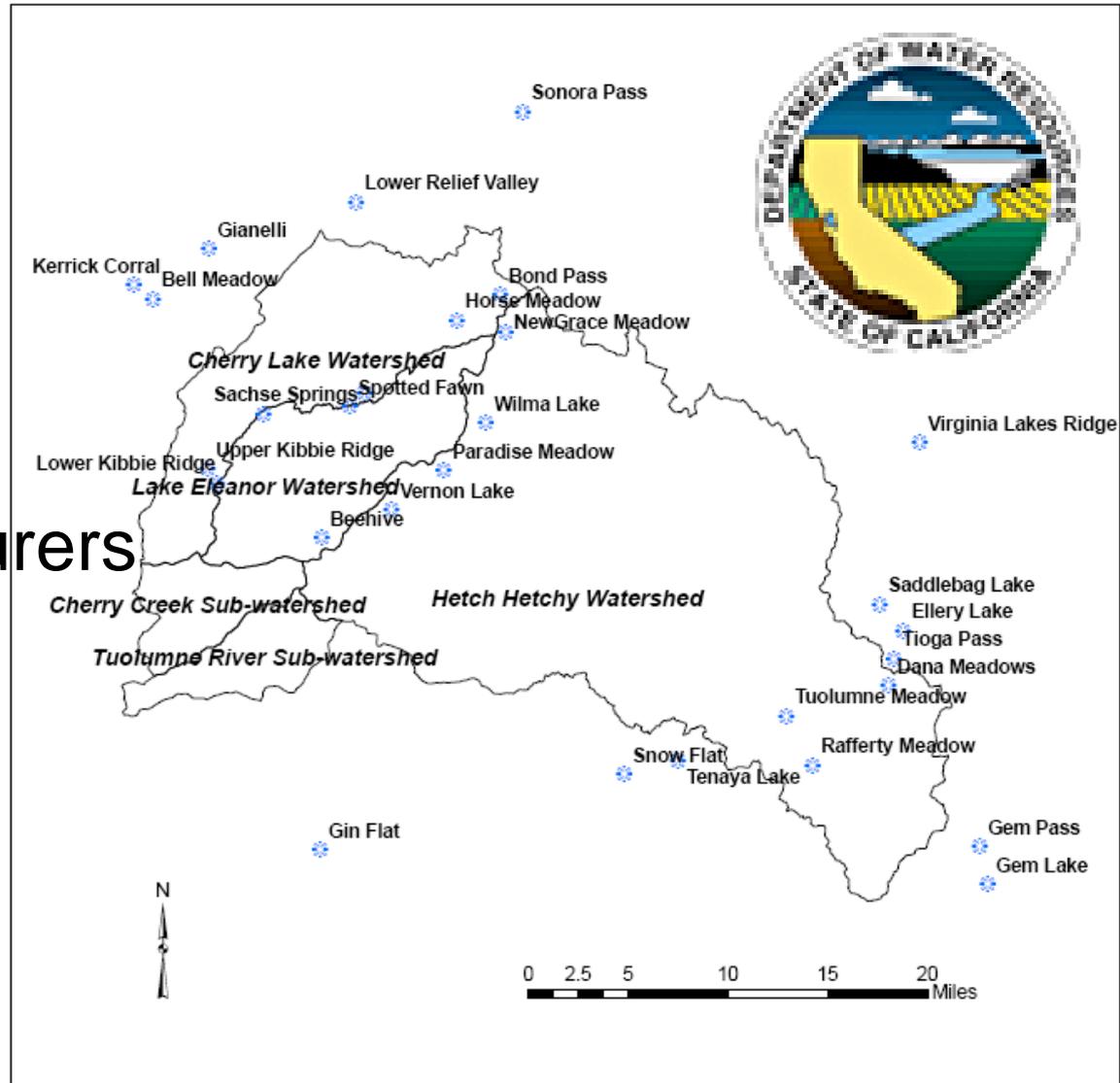
Data we use – from in & outside the basin

- Watershed

- Walker
- Stanislaus
- Merced
- Mono Lake

- Cooperator Measurers

- US Forest Service
- National Park Service
- PG&E
- So. Cal Edison



Thank You Snow Survey Cooperators!

