

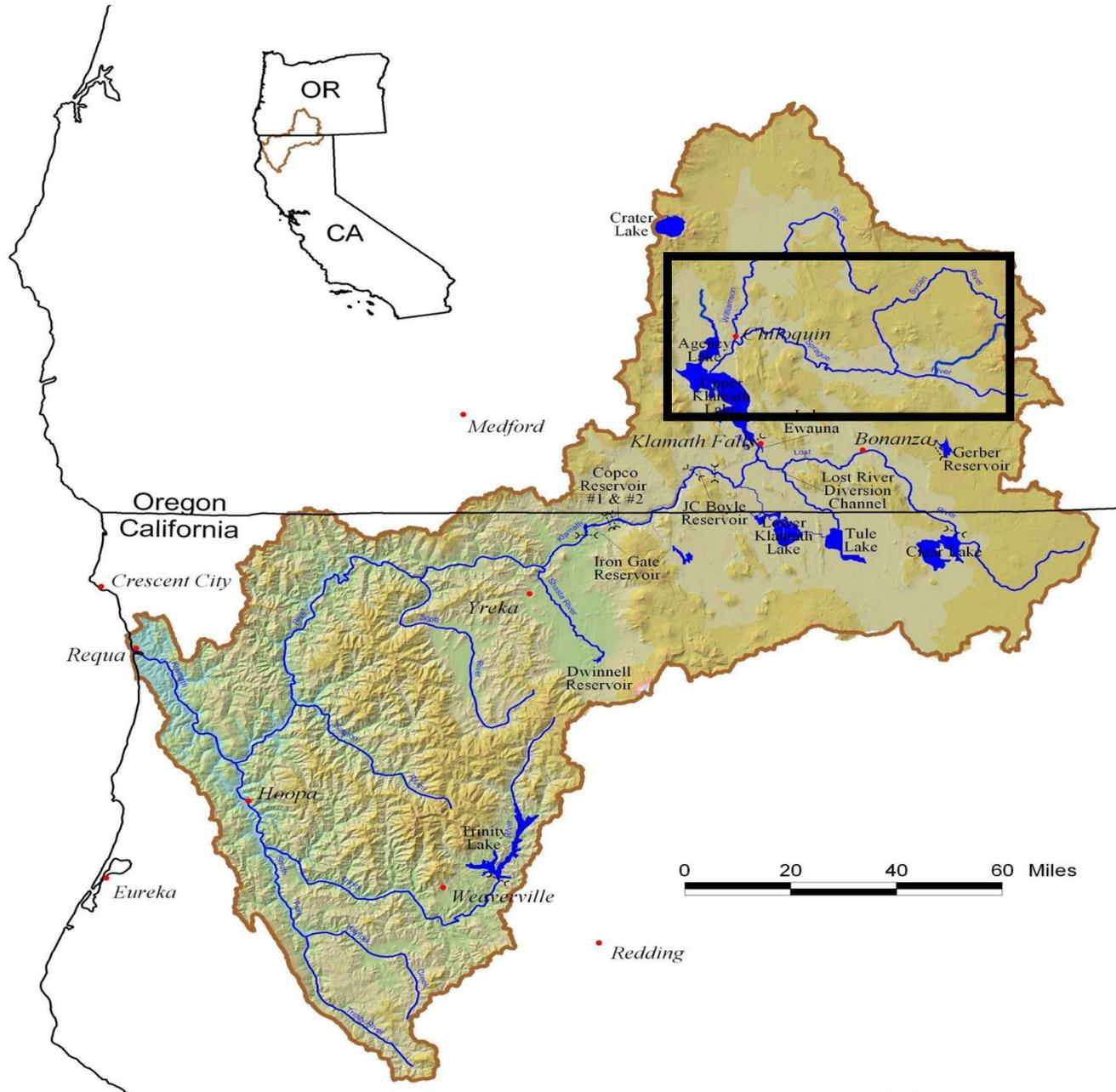
Use of METRIC-based ET Estimates as a Basis for Settling a Water Rights Conflict over In-stream Flows and Irrigation Diversions Among an Indian Tribe, the United States, and Private Ranchers in Oregon

Larry Dunsmoor
Water Management Liaison
Klamath Tribes

In collaboration with:
Dan Snyder, Dennis Lynch, and John Risley
US Geological Survey

2015 International Workshop on Evapotranspiration Mapping for Water Security
September 15-17
The World Bank, Washington DC

Klamath River Basin



Water in the Upper Klamath Basin

- Major conflict for decades
- In 2013, Klamath Tribes won the most senior water
- Tribal rights are for in-stream flows



Water in the Upper Klamath Basin

- Western water rights: first in time is first in right
- Scarcity = junior water users lose access to water

■ Plenty of local links action ... Sports, B1 and B2

FRIDAY-SATURDAY



www.heraldshdnews.com



Weather
Mostly cloudy, chance of snow showers. Highs near 40 Saturday.
Details, page B8.

April 6, 2001— No. 19,739

Klamath Falls, Oregon

50 Cents

No water for most farmers

Thousands of acres will go dry for benefit of fish

By JOHN BRAGG
H&N Staff Writer

Federal officials today announced that no water will be available from Upper Klamath Lake to supply farmers of the Klamath Reclamation Project.

However, Bureau of Reclamation officials said, about 70,000 acre-feet of water from other sources will be available for irrigation of lands on the east side of the project. That includes Horsely and Langell Valley irrigation districts, according to Dave Solem, director of the Klamath Irrigation District.



H&N photo by Gary Thom

Hank's Marsh lies saturated on the east side of Upper Klamath Lake in this photo taken Thursday. Water in the lake will be conserved to keep marshes flooded this summer, while no water from the lake will be diverted for agricultural use.

U.S. Fish and Wildlife Service office in Klamath Falls said he sucker opinion

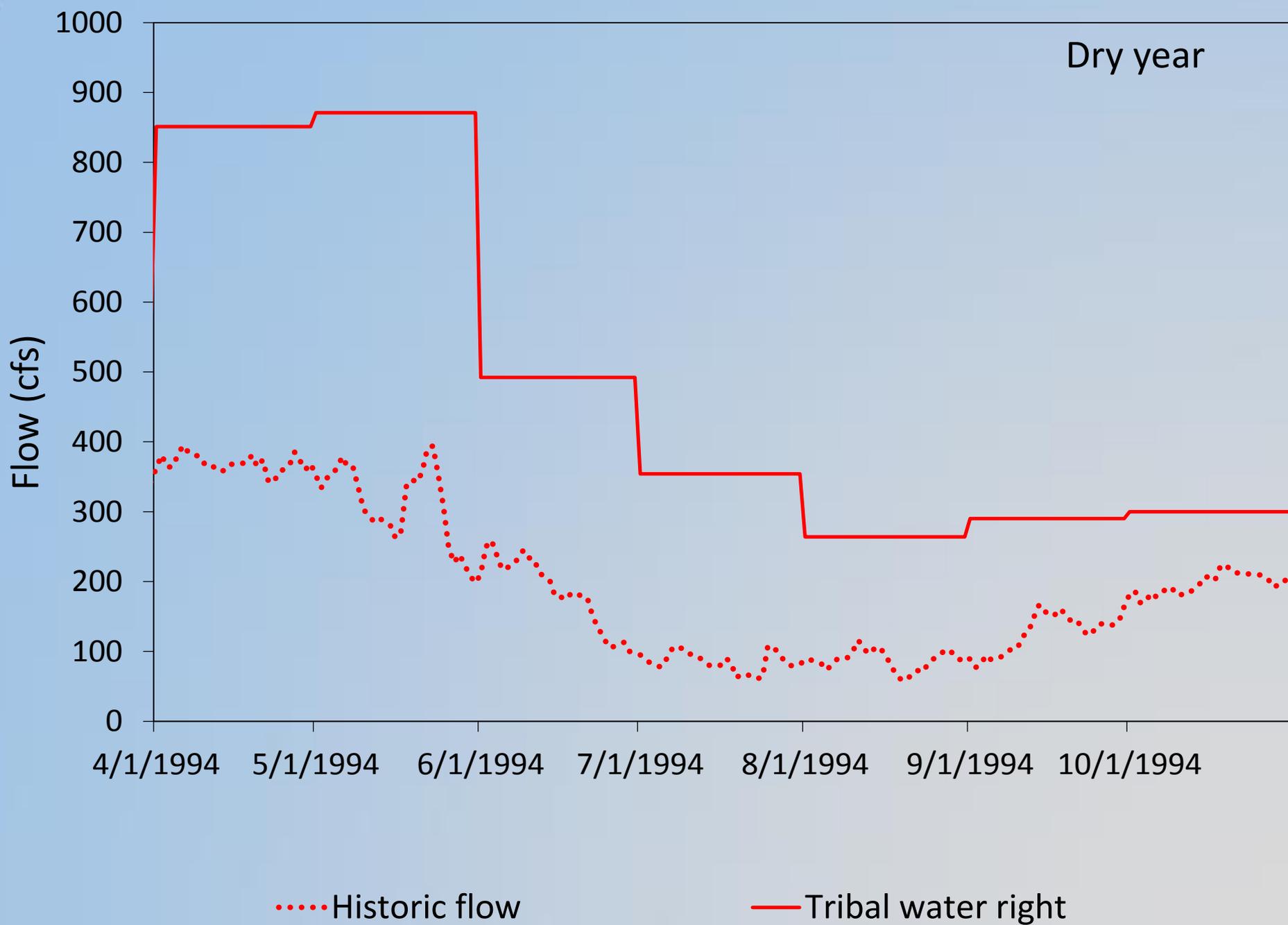
It provides us with the opportunity to operate the project without jeopardizing

spokesman for Walden, said there was little to do now but try to minimize the damage.

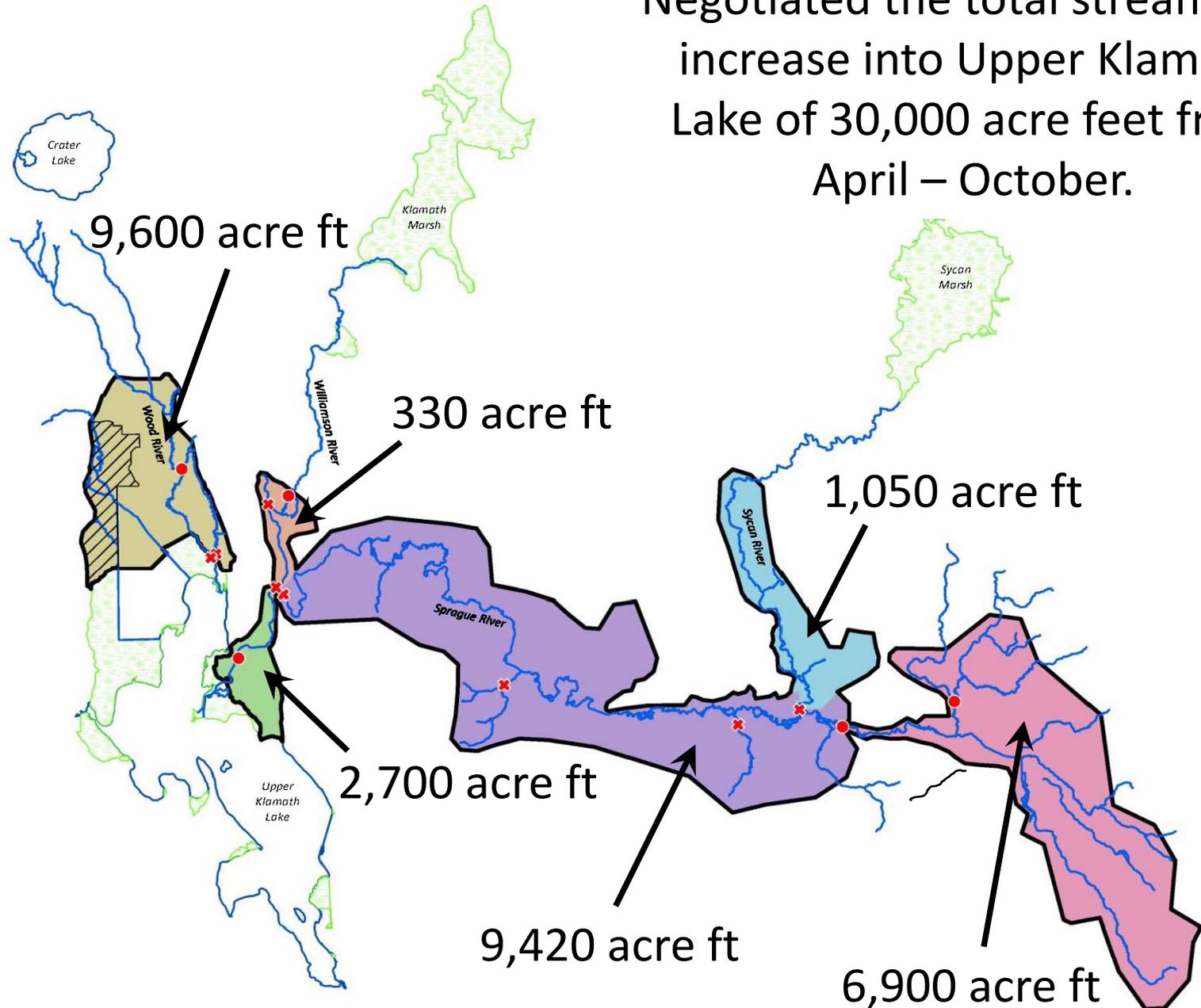
The announcement included word from the Department of Agriculture that most crops in the affected area are eligible for crop insurance or other assistance, including "prevented planting" payments for farmers who purchased crop insurance before the drought was declared. Farmers should contact their crop insurance agents for details, Reclamation officials said.

Sen. Gordon Smith will be in Klamath Falls Saturday morning for a town hall meeting at 10:30 a.m. at the Shilo Inn. Afterwards he will have lunch privately with the Klamath Water Users Association and community leaders. Chris Mathews, Smith's spokesman, said the agenda for the meeting was not yet finalized.

Don Russell, chairman of the Klamath Water Users

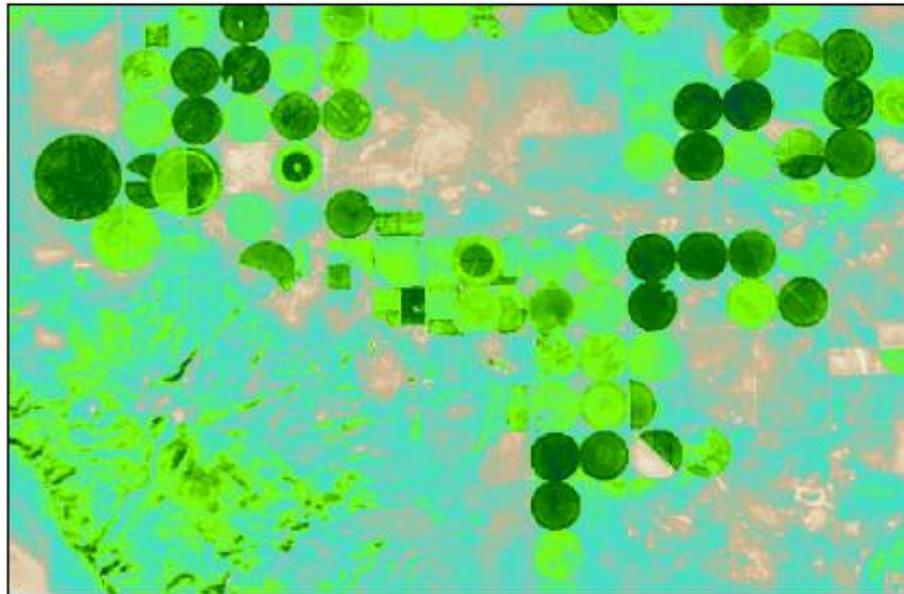


Negotiated the total streamflow increase into Upper Klamath Lake of 30,000 acre feet from April – October.



**Completion Report on the Production of
Evapotranspiration Maps for Year 2004
for the Upper Klamath and Sprague area of Oregon
using Landsat Images and the METRICtm Model**

Report by
Evapotranspiration, Plus
3496 N. 2500 E.
Twin Falls, ID 83301



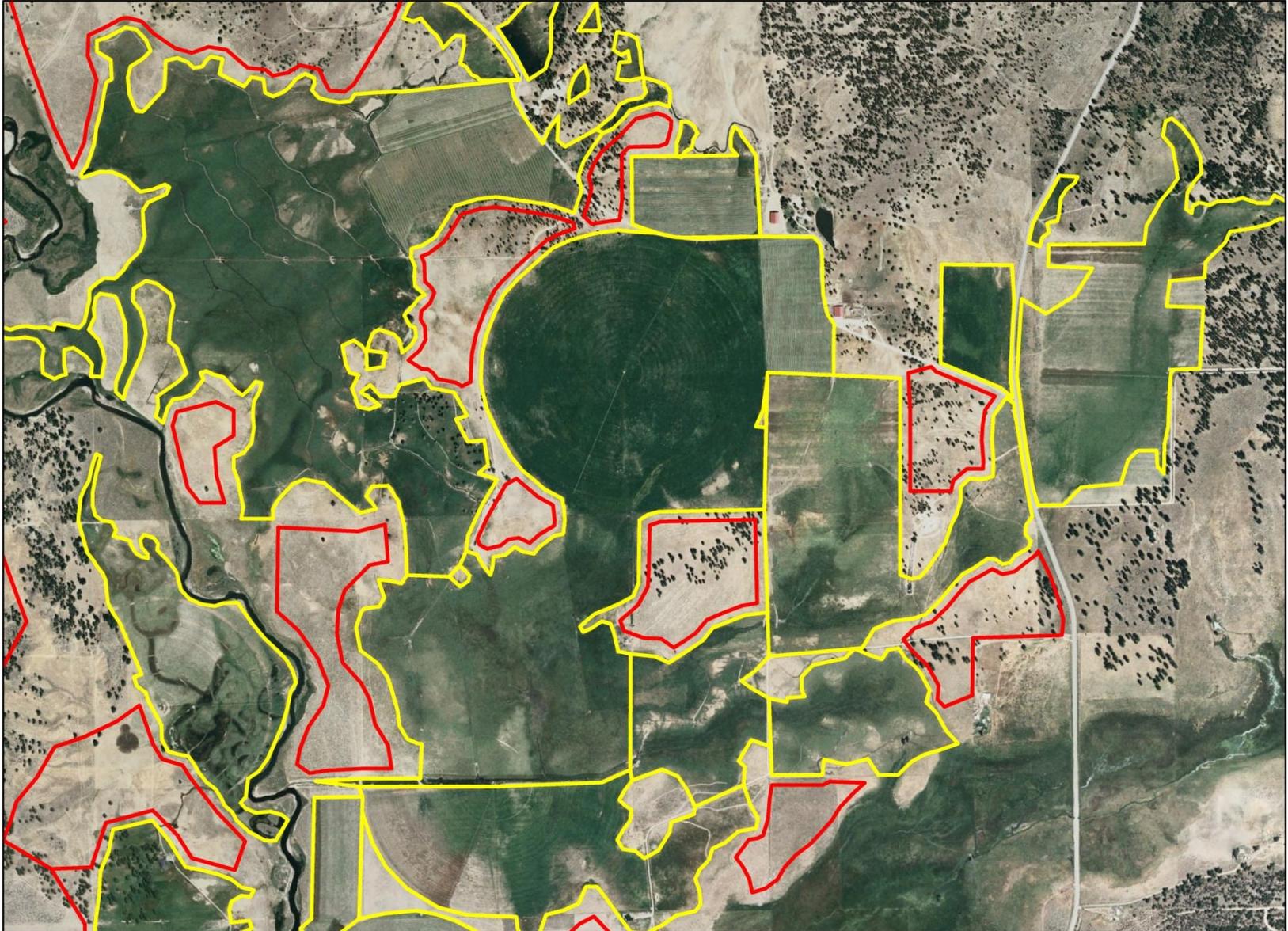
Submitted to

US Geological Survey
Oregon Water Science Center
Portland, OR

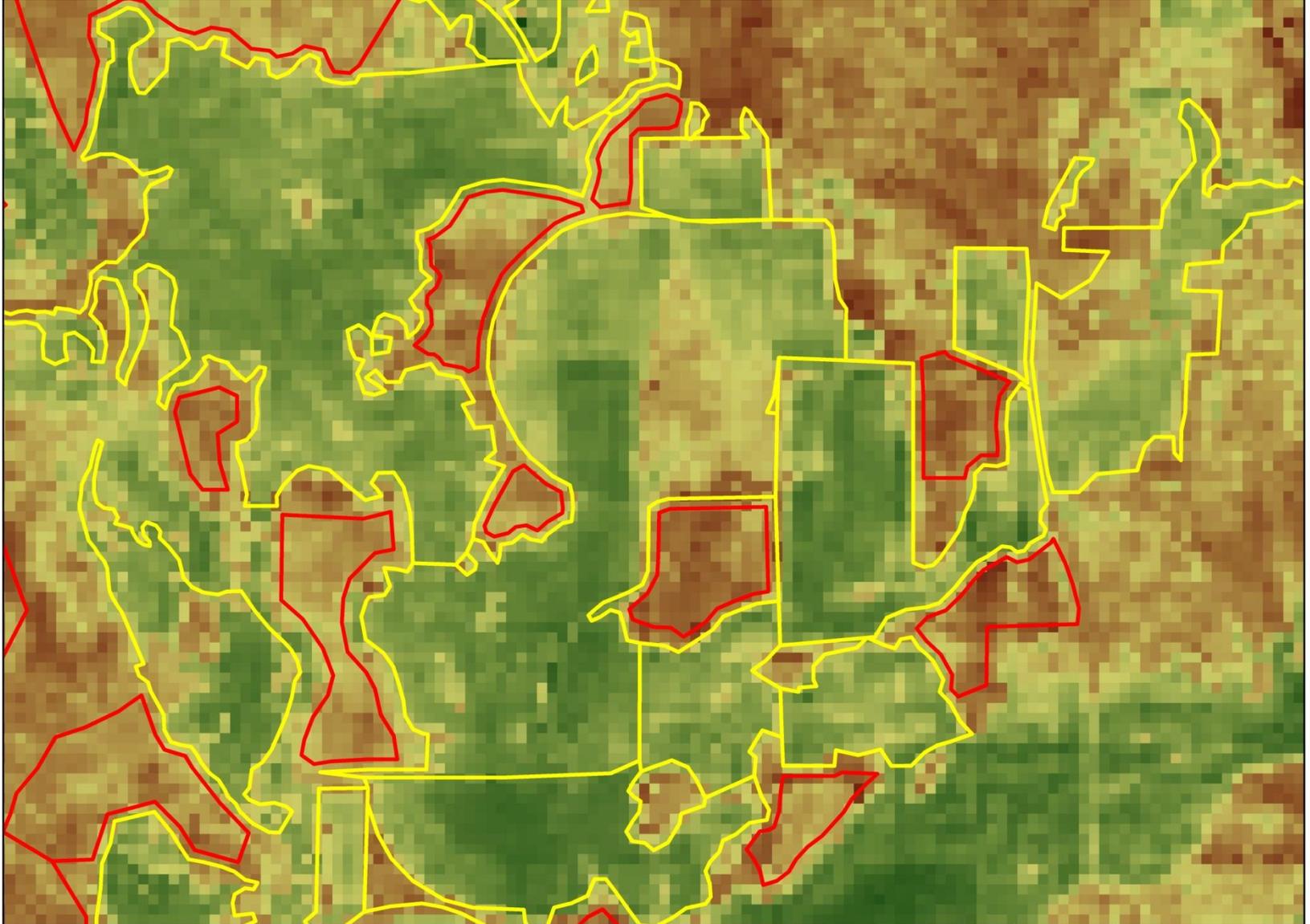
March 2011

(revised 3/28/2011 by R.G. Allen (ET+) and D.T. Snyder (USGS))

- Digitize polygons around irrigated areas
- Digitize polygons around unirrigated areas thought to represent reasonable ET signatures of irrigated areas if irrigation ceased



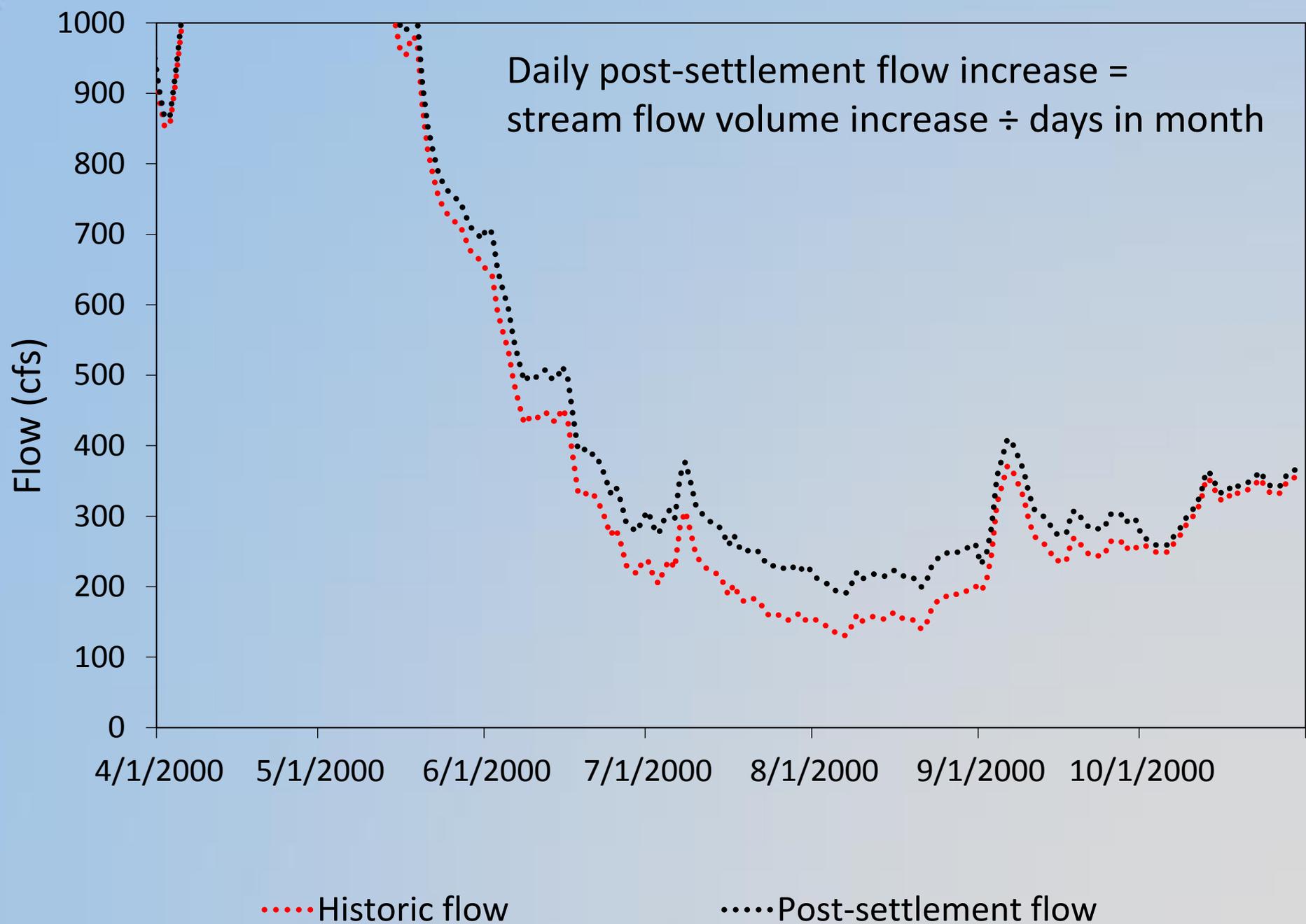
- Extracted irrigated and unirrigated ET depths from METRIC results
- Net Consumptive Use = Irrigated ET - Unirrigated ET
- Assume NCU amount = instream flow increase if irrigation is retired



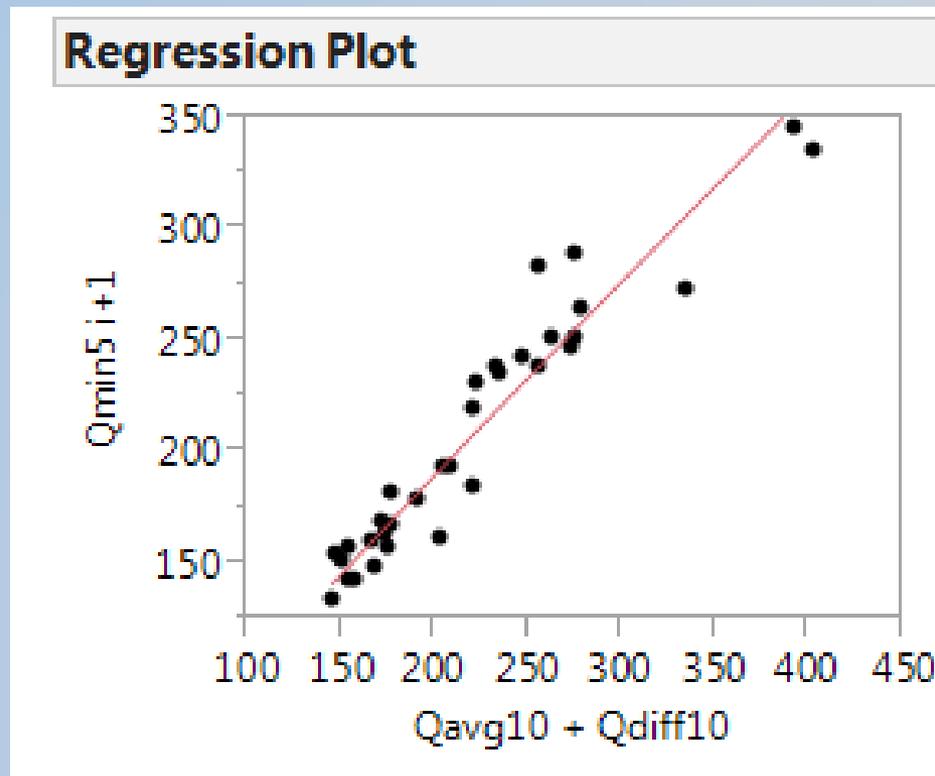
Use the pattern of NCU to partition the water use retirement obligation for the irrigation season:

Monthly NCU % x 6,900 ac ft = monthly stream flow volume increase

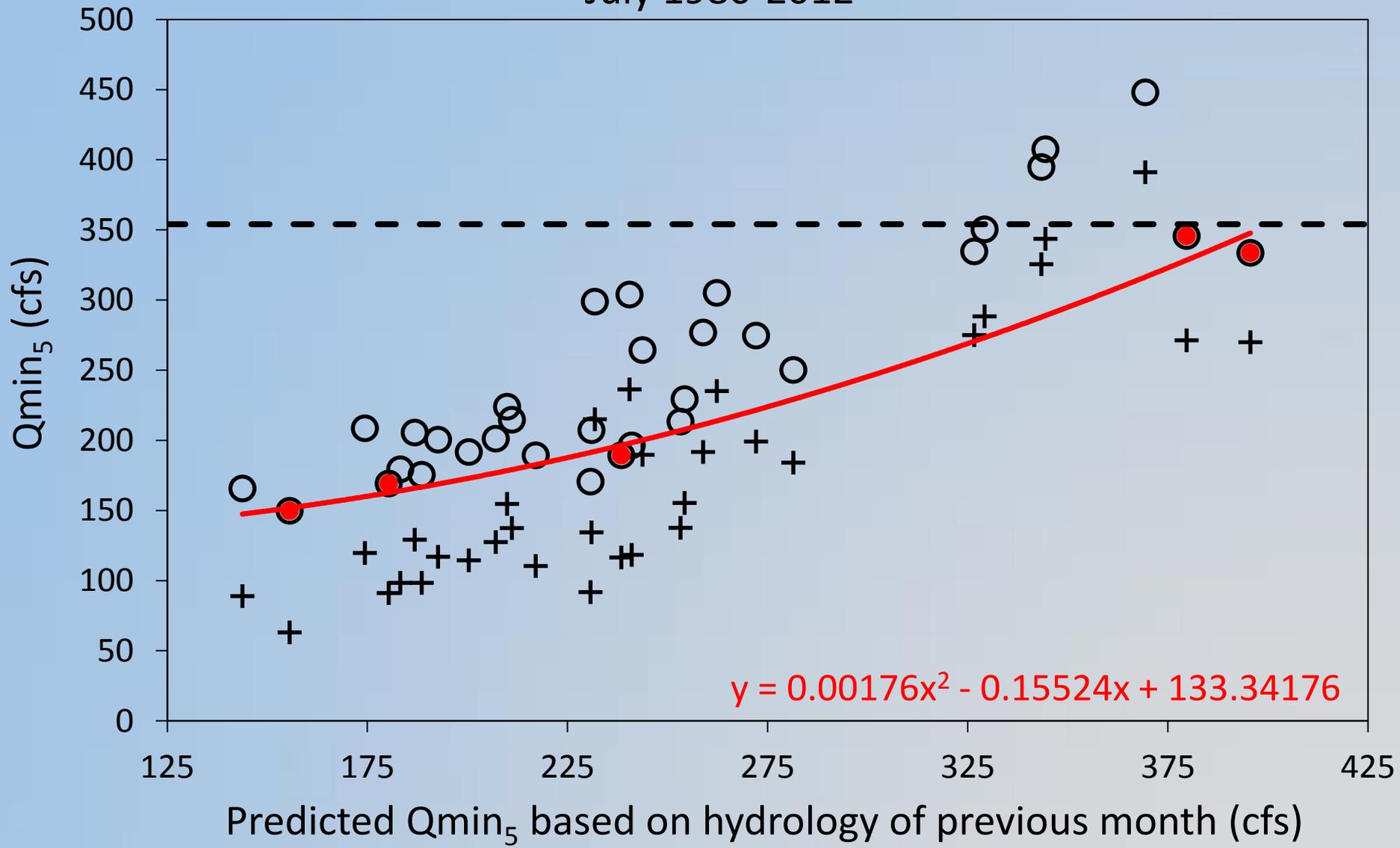
Sub-basin share of total stream flow increase = 6,900 acre feet		
Month	Net Consumptive Use (% of Apr-Oct total)	Required stream flow increase volume (acre feet)
4	3%	192
5	12%	821
6	22%	1,487
7	26%	1,781
8	22%	1,495
9	13%	890
10	3%	235
Total	100%	6,900



- Using estimated post-settlement flows:
 - Calculate Q_{min_5} for each month = average of the five lowest mean daily flows in each month.
 - Develop a series of monthly regressions using variables describing flows in each month to predict the Q_{min_5} in the following month.



July 1980-2012



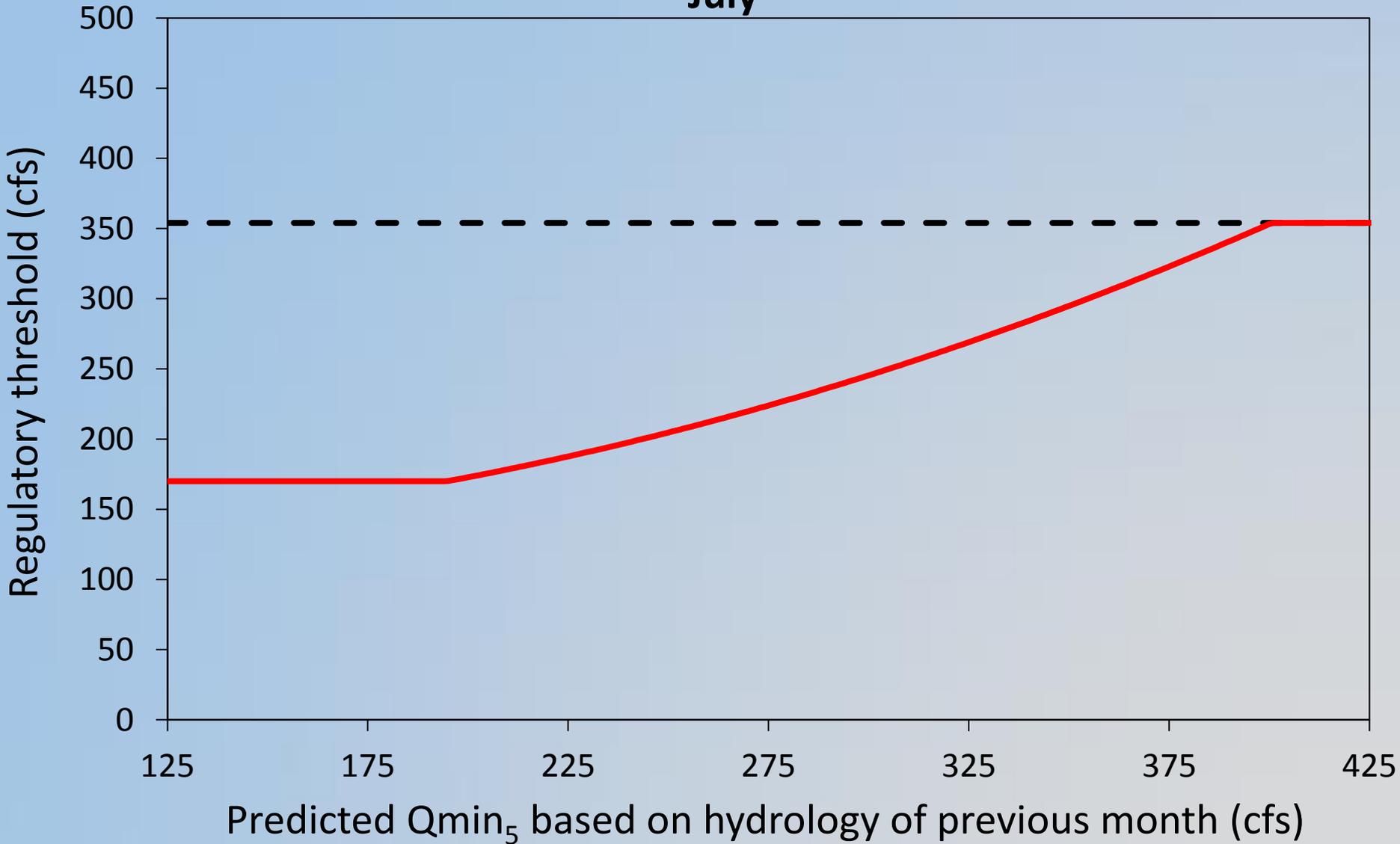
+ Historic flow

O Post-settlement flow

- Tribal water right

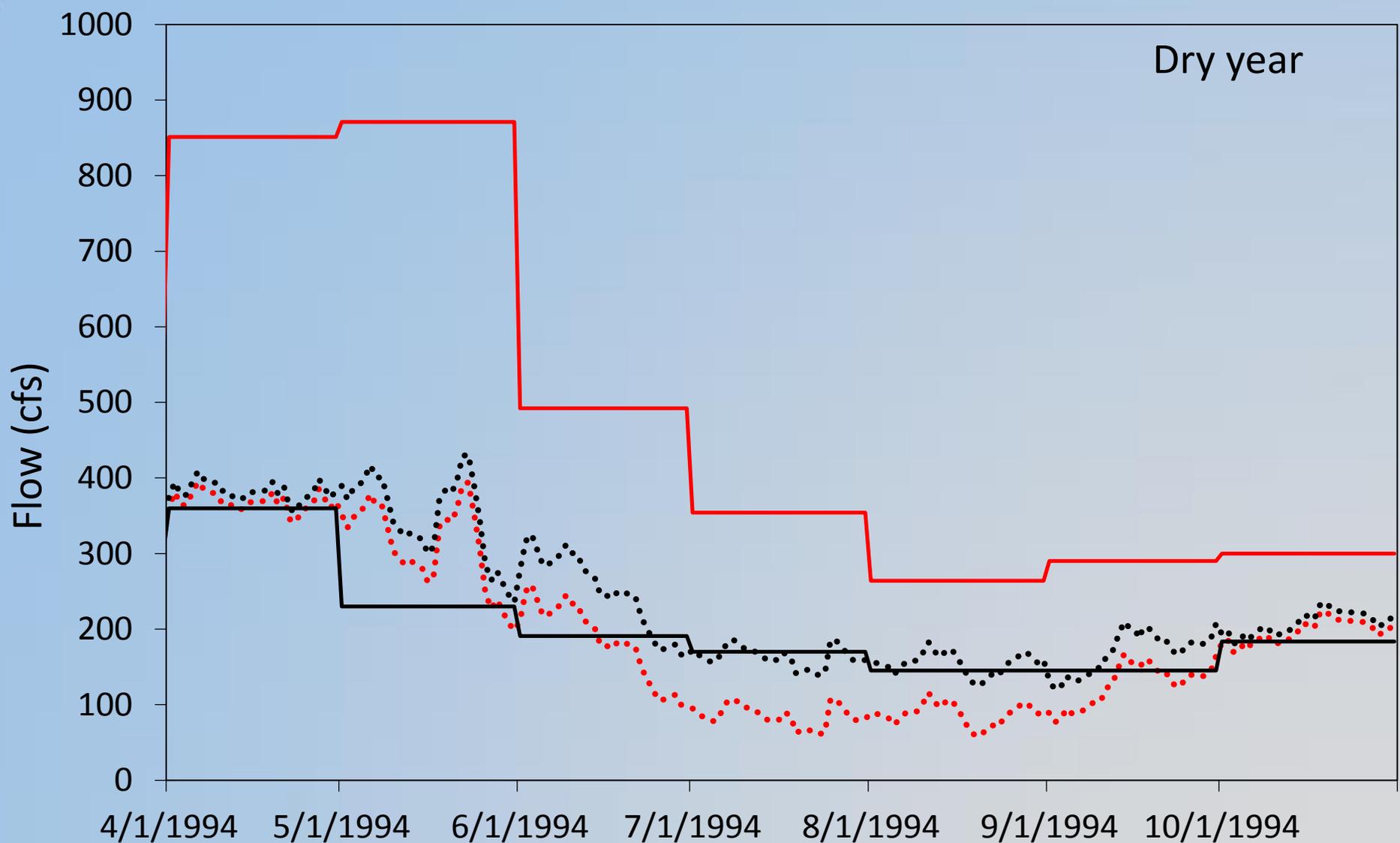
● Points for fitted curve

July



- Tribal water right

— Settlement-based regulatory threshold



..... Historic flow

— Tribal water right

..... Post-settlement flow

— Post-settlement regulatory threshold

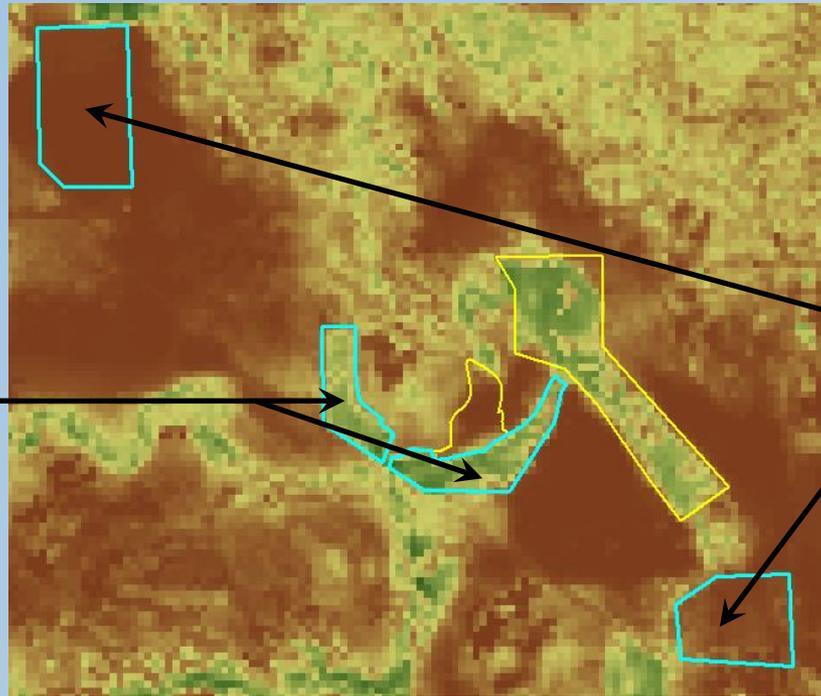
What motivated the Tribes to be so flexible?



Permanent Riparian Management Agreements on more than 225 miles of streams above Upper Klamath Lake.

Using METRIC results to implement the agreement

Irrigated
target for
retirement
– 53 acres



Unirrigated
comparisons

