

SECTORAL APPLICATIONS RESEARCH PROGRAM (SARP) PROJECT PROGRESS REPORT

PROJECT TITLE: From Fisheries Manager to Family Farmer: Improved Products for Communicating Water Supply and Drought Risk for Daily Decision Making within the Klamath Basin, California and Oregon, USA

INVESTIGATORS (Research team and full contact information):

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NOAA GRANT NUMBER: NA12OAR4310096; Funding Amount \$228,605. Grant funds expended through April 30, 2014 \$191,071. Remaining grant funds for use by close of grant period on July 31, 2014 \$37,534.

PROJECT YEARS: August 1, 2012 – July 31, 2014

TIME PERIOD ADDRESSED BY REPORT: May 1, 2013 – April 20, 2014

I. PRELIMINARY MATERIALS (Information in this section is standard and may be updated and/or copied from previous progress reports)

A. Research project objective. (Limited to one paragraph)

The project objective is to use the Stakeholder community within the Klamath Basin as a “test-bed” for the conceptual development of a suite of improved and enhanced climate, drought and water supply tools and applications which are effective at providing climate and water related data tailored to the specific resource decisions among the Stakeholders to minimize decision risk.

B. Stakeholders and decision makers with whom you are working (in bulleted form).

Title	First Name	Last Name	Job Title	Company
Mr.	Greg	Addington	Executive Director	Klamath Water Users Association
Mr.	Ed	Bair	Agricultural Producer	Bair Farms
Mr.	Hollie	Cannon	Executive Director	Klamath Water and Power Agency
Mr.	Ron	Cole	Refuge Manager	US Fish & Wildlife Service
Dr.	Mark	Deutschman	PE	Houston Engineering, Inc.
Mr.	Larry	Dunsmoor	Environmental Contact	Klamath Tribes
Mr.	Dave	Felstul	Hydrologist	Klamath Basin Area Office
Mr.	Terry	Fisk	Hydrologist	U.S. Fish and Wildlife Service
Dr.	David	Garen	Hydrologist (Co-PI)	USDA-NRCS
Mr.	Robert	Hartman	Hydrologist In Charge (Co-PI)	National Weather Service California-Nevada River Forecast Center
Ms.	Lani	Hickey	Natural Resources Manager	Klamath County Public Works Department
Mr.	Dennis	Linthicum	County Commissioner	Klamath County Government Center Building
Mr.	Dave	Mauser	Wildlife Biologist	US Fish & Wildlife Service
Mr.	Jamie	Montesi	Hydrologist	NOAA - National Marine Fisheries Service SW Region
Mr.	Jason	Phillips	Area Office Manager	Klamath Basin Area Office

Title	First Name	Last Name	Job Title	Company
Mr.	Dave	Simeral		Divison of Atmospheric Sciences, Western Region Climate Center
Mr.	Jim	Simondet	Klamath Supervisor/Coordinator	NOAA - National Marine Fisheries Service SW Region
Mr.	Stan	Strickland	Director	Klamath County Public Works Department
Mr.	Mark	Stuntebeck	Manager	Klamath Irrigation District
Mr.	Marc	Van Camp	PE	MBK Engineers
Mr.	Scott	White	Watermaster	Department of Water Resources Klamath Falls

C. **Approach** including methodological framework, models used, theory developed and tested, project monitoring and evaluation criteria. Include a description of the key beneficiaries of the anticipated findings of this project (e.g., decision makers in a particular sector/level of government, researchers, private sector, science and resource management agencies). (Limit of one page)

This research is expected to result in benefits to NOAA, the NWS-CNRFC, the NRCS-NWCC and the broader affected Stakeholder community, not only within the Klamath Basin, but within western basins facing similar resource issues. Specifically, the research identifies specific new climate, drought and water supply products tailored to meet the specific needs of a broad stakeholder community. The following table generally categorizes the Stakeholder community in the Klamath Basin into groups based upon the decision type and the entity relying on the climate data and drought risk products for decision making.

Decision Type	Entity Relying on Climate Data and Water Supply Forecasts for Decision Making
Threatened and Endangered Species	U. S. Fish and Wildlife Service NOAA National Marine Fisheries
Managing Natural Resources	U.S. Fish and Wildlife Service U.S. Forest Service Native American Nations Bureau of Land Management Natural Resources Conservation Service
Refuge Operations	U.S. Fish and Wildlife Service
Water Supply	U.S. Bureau of Reclamation

Decision Type	Entity Relying on Climate Data and Water Supply Forecasts for Decision Making
(Delivery)	Irrigation Districts Klamath Water and Power Agency
Water Administration (Regulatory)	Oregon Department of Water Resources California Division of Water Rights Local Units of Government
Potable Water Supply	Local Units of Government
Business	Agricultural Insurance Companies Local business community Forest products industry
Agricultural Production	Farmer / Rancher Oregon State Extension Service
Power Generation	Klamath Water and Power Agency PacifiCorp
Water Quality	Local Units of Government Oregon Department of Environmental Quality California Environmental Protection Agency Environmental Protection Agency

One of the primary benefits of the research is an improved understanding of the societal and social aspects of using climate, water resources and water supply forecast data for decision making. Specifically the research describes how an extremely broad stakeholder community responsible for managing water and natural resource issues relies upon climate data, water resources data and water supply forecast results for making water and natural resource decisions. An additional benefit is the research identifies specific concept products that can be implemented by the NWS-CNRFC and the NRCS-NWCC using existing climate data and water supply forecast modeling results, that meet the needs of the Klamath Basin stakeholders and be used in other western basins across the U.S.

The research provides benefits to those entities within the Klamath Basin directly responsible for managing water. These entities include the Bureau of Reclamation, the Klamath Water and Power Agency, the Irrigation Districts, the U.S. Fish and Wildlife Refuge Managers and potentially the state water management agencies. The benefits to these entities is realized by the development of concept water supply and drought risk products specific to their decision making needs, concepts that can be implemented by the NWS-CNRFC and the NRCS-NWCC.

D. Matching funds/activities descriptions, including in-kind, used in this project. (Limit to one paragraph)

Matching funds have been contributed by the participants through their participation in the summit and focus group meetings. This includes the hosting of meeting facilities by Klamath County.

E. **Partners** with whom you are working (e.g., NOAA, other federal agencies, academia, nongovernmental organizations, private sector, etc.) (No text limit)

See B. above.

II. **ACCOMPLISHMENTS** (Information in this section should be updated annually)

A. Project timeline and tasks accomplished (Can be submitted in bullet form – limit of 2 pages)

This research project consists of the following tasks.

Task 1. Modify Klamath Basin DSS for Use as a Project Communication Tool

Task 2. Organize, Conduct and Document the Klamath Basin Water Supply and Drought Summit

Task 3. Organize, Complete and Document the Focus Group Meetings

Task 4. Develop Stakeholder Specific Products for Communicating Water Supply / Drought Risk

Task 5. Complete a Final Summit Meeting

Task 6. Complete Local Community Outreach Meeting

Task 7. Watershed Viewer Enhancements

Tasks 1 through 6 are fully complete. A draft final report was completed and circulated to the NRCS-NWCC and CNRFC for review by Dr. David Garen and Mr. Alan Haynes. Their comment were incorporated into a final report. The website www.klamathdss.org has been modified as a tool for dissemination the information from this research.

Completion of the final summit meeting and community outreach tasks occurred in April 2014 and the results of the meetings are summarized in the final user needs report. Meetings were held with NOAA National Marine Fisheries, the irrigated agricultural community (i.e., Klamath Water Users Association, Klamath Water and Power Authority, Irrigation Districts), the Klamath County Board of Commissioners, Oregon Department of Water Resources, and the Bureau of Reclamation, to present the preliminary findings contained with the draft User Needs Report. The preliminary research findings were presented in summary form at these meetings. The meetings included a presentation of a concept tool intended to how to meet the user's climate and water resources data needs were presented. The meetings specifically requested feedback about whether the concept is valuable for meeting their climate data, water data and water supply forecast data needs. Based upon the feedback received we are proceeding to develop the concept application called the

“Watershed Data Harvestore” which is intended to serve as a data applications interface to retrieve diverse data sets and combined them into a single database.

B. Application of your findings to inform decision making and any highlights of communicating or translating science to decision makers (e.g. media events, presentations, briefings, representation on or input to decision making bodies, etc.).

Through this research we have identified several ways to improve the value of climate data, water data and water supply forecast information to the users. The final user needs report includes several recommendations with regard to how data context can be established. We also have identified in detail specific Stakeholder decisions which rely on climate data, water data and water supply forecast information. The actions they take using the information have also been identified. Lastly, a novel concept for providing these data incorporating the lessons learned from the research is presented in the final user needs report. Some of these ideas and concepts can be implemented by the various federal agencies.

C. Planned methods to transfer the information and lessons learned from this project.

The final deliverables from the research are expected included several (written) scientific peer reviewed and non-peer reviewed works including:

- Klamath Basin Water Supply and Drought Management Summit Summary;
- Written focus group summaries;
- Final report;
- Conference presentations; and
- One manuscript published in a journal.

The final report includes new concept product recommendations tailored to the decision making needs of each unique Stakeholder group, for communicating water supply and drought risk. The new concept products are expected to capitalize on the synthesis and integration of existing climate data and water supply forecast modeling results. The final report is expected to serve as a guide to the NRCS-NWCC and NWS-CRNFC (and NOAA) for the development, deployment and implementation of advanced products.

The deliverables will include development of the concept application called the “Watershed Data Harvestore” which is intended to serve as a data applications interface to retrieve diverse data sets and combined them into a single database. Once the data are stored within the database they can in the future be linked to the Watershed Viewer application within the Klamath Basin Decision Support System. Specifically, we hope in a future application to develop products recommended in the final user needs report.

D. Significant deviations from proposed workplan (e.g., shift in priorities following consultation with program manager, delayed fieldwork due to late arrival of funds, obstacles encountered during the course of the project that have impacted outcome delivery). (Limit to one paragraph)

No significant deviations. We are proceeding with the development of the Watershed Data Harvest application with the intent of developing a fully distributable application.

E. **Completed publications, white papers, or reports** (with internet links if possible). These can be either non-peer reviewed or peer-reviewed. For peer-review publications, please list either published or in press, but not “in review”. (No text limit)

Download from www.klamathdss.org/NOAAgrant.php



User Needs Requirements

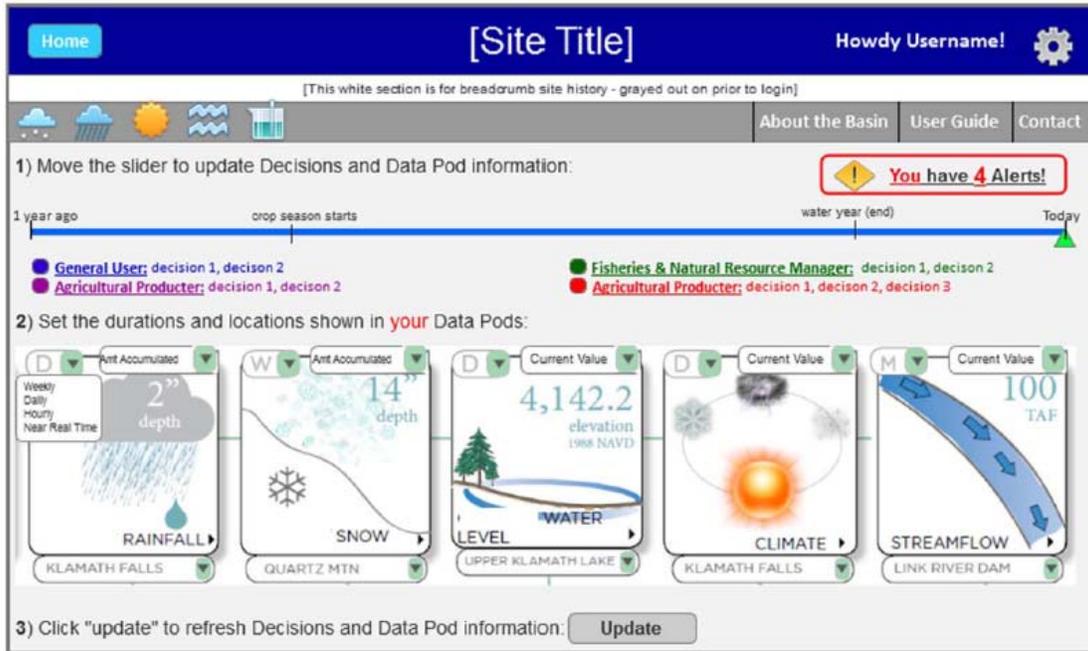
April 2, 2014 • Klamath Falls, OR

*From Fisheries to Family Farmer:
Improved Products for Communicating
Water Supply, Drought, and Climate Change Risk for
Daily Decision-Making Within the Klamath Basin*

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III. GRAPHICS: PLEASE INCLUDE THE FOLLOWING GRAPHICS AS SEPARATE ATTACHMENTS TO YOUR REPORT

Applications interface showing the idea of “data pods” for the concept web application.



In order to better promote your work and the work of this program, please provide the following for use in communication materials for NOAA and external audiences.

Feel free to use any materials from the summit or focus group meetings.

IV. WEBSITE ADDRESS FOR FURTHER INFORMATION (IF APPLICABLE)

www.klamathdss.org

V. ADDITIONAL RELEVANT INFORMATION NOT COVERED UNDER THE ABOVE CATEGORIES

Reports and presentations uploaded.