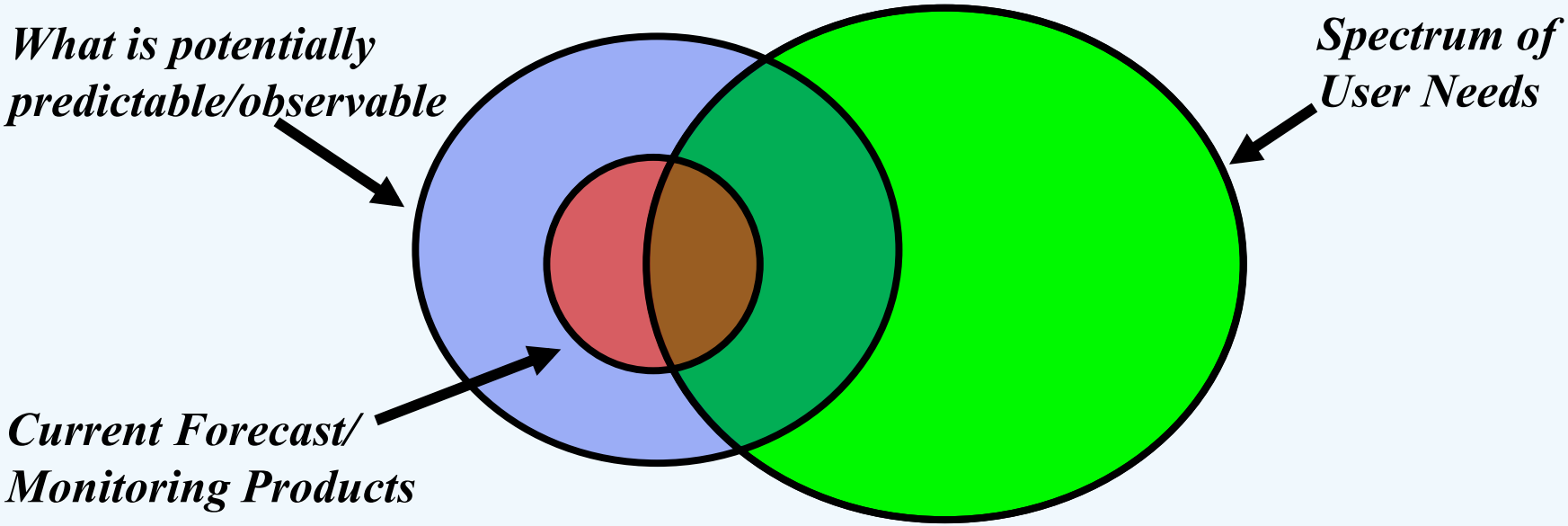
Climate, Weather and Water Services

Robert Webb

Summary and Way Forward

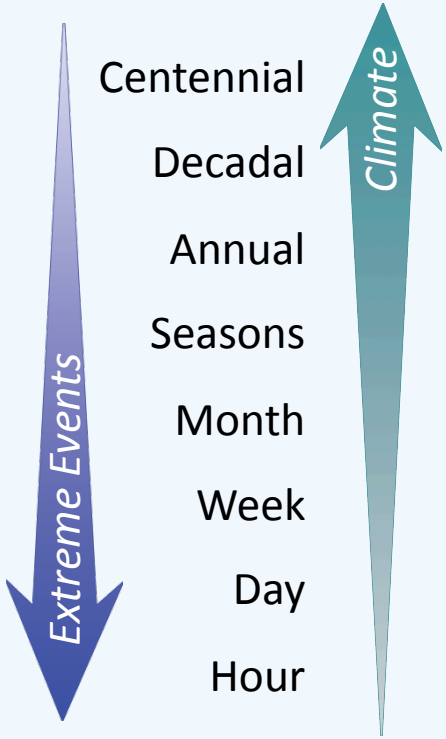
Develop, Improve, and Support NOAA Services by Producing Information at Spatial and Temporal Scales Relevant for Decision-making

Problem-Focused Applied Research and Prototyping that Link Research to Decision Making



Balancing the tension between what users want and what is justifiable scientifically

PSD Applied Research and Prototyping to Help Meet User Information Needs



User and stakeholder information needs do not distinguish between the weather and climate or differentiate between research and operational.

Product Source

Discover	Development	Proof of Concept	Experimental	Operational
Research		Knowledge		Operations

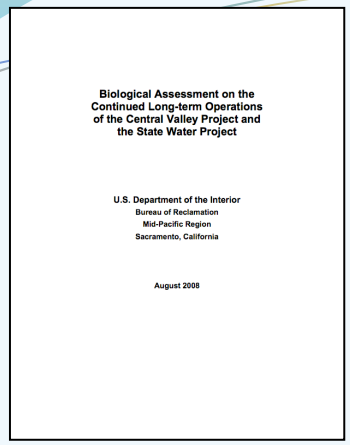
A Common Thread: Elements of Early Warning Information Systems

Western Water Assessment

- Public Awareness And Education
- Engaging Preparedness Communities
- Integrated Monitoring and Forecasting
- Interdisciplinary Research and Applications
- Communication (portal)

NIDIS
NATIONAL INTEGRATED DROUGHT INFORMATION SYSTEM

PSD Research Process: Co-Production of Knowledge



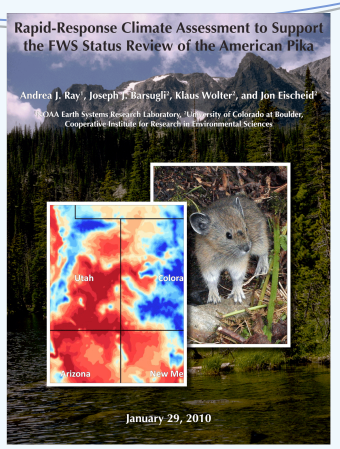
Biological Assessment on the Continued Long-term Operations of the Central Valley Project and the State Water Project

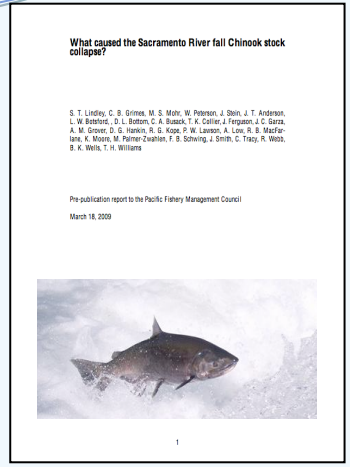
U.S. Department of the Interior
Bureau of Reclamation
Mid-Pacific Region
Sacramento, California

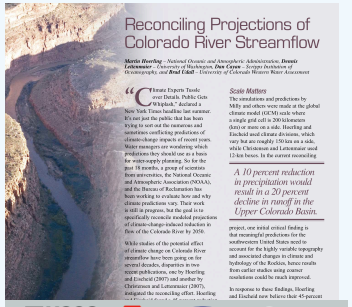
August 2008

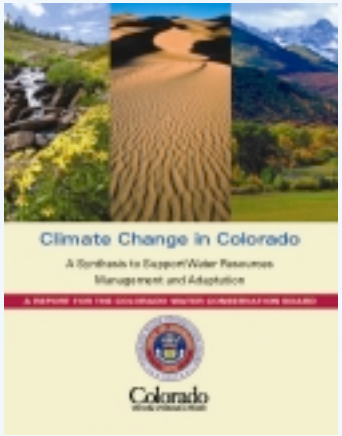
FISHERIES OCEANOGRAPHY

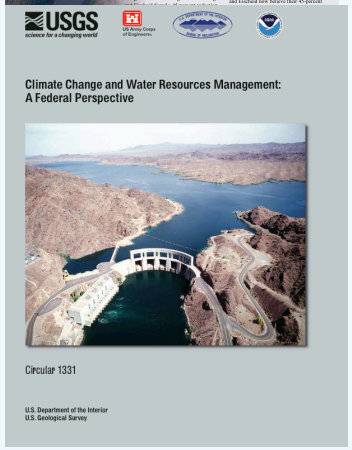
Bottom-up forcing and the decline of Steller sea lions (Eumetopias jubatus) in Alaska: assessing the ocean climate hypothesis

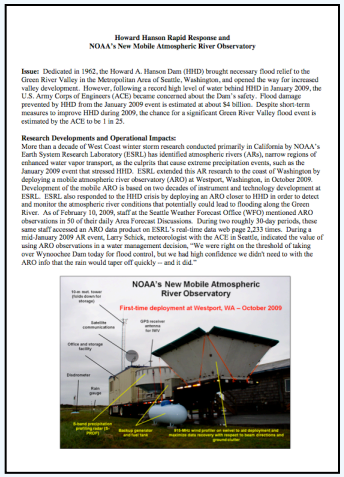


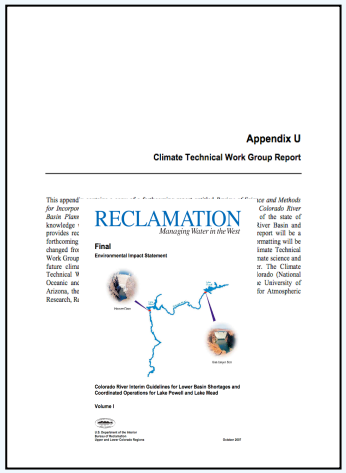




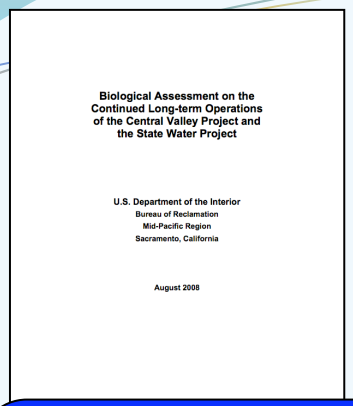








PSD Research Process: Co-Production of Knowledge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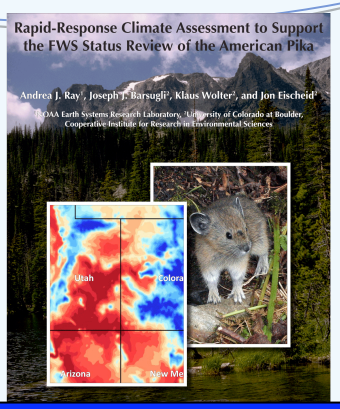
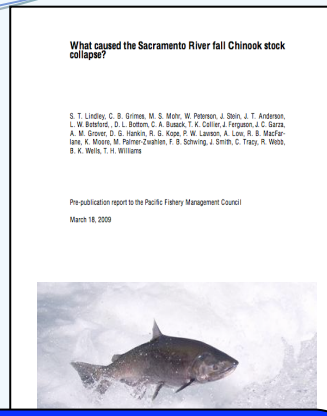
Reconciling Projections of Colorado River Streamflow



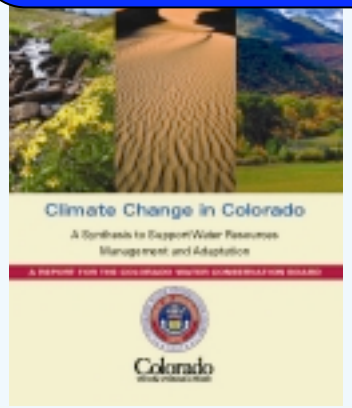

What caused the Sacramento River fall Chinook stock collapse?

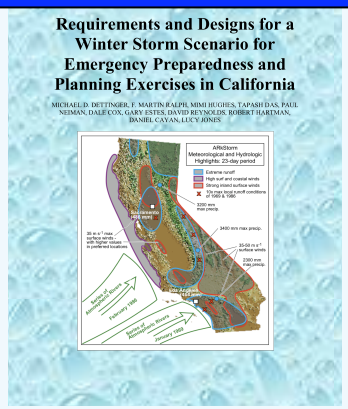
S. T. Lindley, C. B. Grimes, M. S. Mohr, W. Peterson, J. Stein, J. T. Anderson, L. W. Botsford, D. L. Bottom, C. A. Busack, T. K. Collier, J. Ferguson, J. C. Garza, A. M. Grover, D. G. Hankin, R. G. Kope, P. W. Lawson, A. Low, R. B. MacFarlane, K. Moore, M. Palmer-Zwahlen, F. B. Schwing, J. Smith, C. Tracy, R. Webb, B. K. Wells, T. H. Williams

Pre-publication report to the Pacific Fishery Management Council

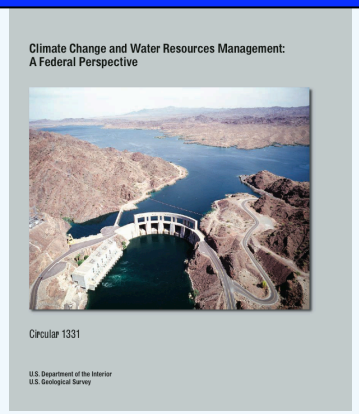
March 18, 2009

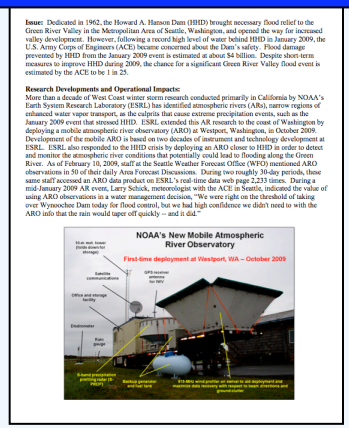
"climate science informing but not prescribing decision-making, and decision-making informing climate science but not prescribing research priorities" (Lowrey et al., 2009)

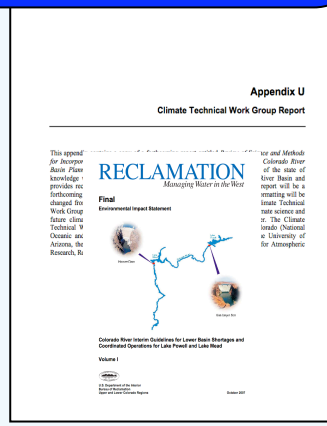



Requirements and Designs for a Winter Storm Scenario for Emergency Preparedness and Planning Exercises in California

MICHAEL D. DETTINGER, F. MARTIN RALPH, MIMI HUGHES, TAPASH DAS, PAUL NEIMAN, DALE COX, GARY ESTES, DAVID REYNOLDS, ROBERT HARTMAN, DANIEL CAYAN, LUCY JONES







PSD Collaborators

Key Partners (*and Customers*)

CIRES and CIRA
Regional Councils
State Agencies
State Task Forces
Municipalities
NOAA-OAR Labs
Other NOAA Joint Institutes
NOAA Line Offices
Interagency Task Forces
Federal Resource Management Agencies
Federal Science Agencies
Other Universities

Sectors

Agriculture
Energy
Recreation
Risk Management
Water Resources

Shared Lessons

- ***Sustained and trusted partnerships with users are essential to success***
- ***Promoting climate literacy and regular communication is critical***
- ***Need to build on existing systems, institutions, programs, relationships & networks***
- ***Developing new services often requires new approaches and research innovation, prototyping, experiment***
- ***Problem-focused approach helps ensure the information produced is actually needed and usable***
- ***Process and products need to be continuously evaluated and adjusted***
- ***Services must be founded on the best available science***

Future Directions

Develop, Improve and Support NOAA Services

- ***Advance understanding of the physical climate system to improve models, predictions and projections***
- ***Develop and apply the best available science at the spatial and temporal scales needed to support decision making***
- ***Observe and forecast hydrologic extremes in support of integrated water resources services***
- ***Bridge the gap between monitoring and predictions through climate attribution***
- ***Integrate physical climate science into ecosystem management through partnerships with resource managers***

Backup Slides

Examples of Applied Research & Prototyping - 1

What We Do/ Time Scales	*Understand, Explain, Predict, Assess, Communicate, Evaluate*	Weather and Climate Phenomena	USBR/USACE Partnership Examples
Short Term Extreme Events	*Develop experimental calibrated hydroclimatic forecasts, ARO monitoring and application products, reanalysis display and analysis tools, experimental attribution of extreme events.*	Subseasonal variability, floods, heat waves	Howard Hanson Dam (WA), Russian River Pilot Study (CA), Folsom Dam (CA), Southern Arizona network, Gila River (AZ)
Seasonal to multi-year	*Develop experimental drought and water supply forecasts, monitoring, and application products, experimental attribution of extreme events Assess social, environmental, and economic impacts.*	Flash droughts, snowpack evolution, monsoon, soil moisture evolution, El Niño and La Niña, multiyearl ocean variability	Upper Colorado River Basin, Southern Arizona network, Apalachicola/ Chattahoochee/Flint River Basin,

Examples of Applied Research & Prototyping - 2

What We Do/ Time Scales	*Understand, Explain, Predict, Assess, Communicate, Evaluate*	Weather and Climate Phenomena	USBR/USACE Partnership Examples
Decadal Climate Variability	*Develop experimental monitoring, attribution, and application products. Assessments of regional trends and risks to inform adaptation strategies.*	Pacific Decadal Variability, Atlantic Multidecadal Variability, Short term influences, Regional Trends	Recent southwest drying trend, Grand Canyon Adaptive Management, Appendix U -Climate Technical Work Group Report, California Central Valley Project
Climate Change	*Develop experimental attribution assessments of hemispheric to regional trends. Assess social, environmental, and economic risks (e.g., Colorado Compact).*	Observed, current and evolving trends, Enhanced hydrologic cycle, High elevation change	Climate Change and Water Working Group, Reconciling Projections Colorado River Flows, USGS 1331 - Climate Change and Water Resources Management: A Federal Perspective