

RECLAMATION

Managing Water in the West

Fiscal Year 2015

Science and Technology Research Awards



U.S. Department of the Interior
Bureau of Reclamation
Research and Development Program

November 2014

**FY 2015 Science and Technology Program
Advanced Water Treatment Research Projects**

Type	Title	Lead	2015 Award
Proposals for New Projects			
Competitive	Development and Commercialization of Chlorine Resistant Membranes	Katherine Guerra	\$ 190,000
Competitive	Solar Photovoltaic Desalination Using Distillation	Mitchell Haws	\$ 150,000
Competitive	Concentrate Management Toolbox and Selected Case Studies	Saied Delagah	\$ 100,000
Competitive	Oxnard Saline Demonstration Wetland	Doug McPherson	\$ 75,000
Competitive	Impacts of Reused/Reclaimed Water: Risks and Benefits	Denise Hosler	\$ 45,000
		New Projects Total	\$ 560,000
Continuing Projects			
Competitive	Investigating an Innovative Constructed Wetland Design for Removing Endocrine Disrupting Compounds from Reclaimed Wastewater	Chris Holdren	\$ 210,000
Competitive	Robust Water Treatment Systems for Rural and Small Communities	Michelle Chapman	\$ 130,000
Competitive	Development and evaluation of a hybrid photovoltaic reverse osmosis system for treating brackish groundwater	Katherine Guerra	\$ 75,000
		Continuing Projects Total	\$ 415,000
	TOTAL AWARD		\$ 975,000

**FY 2015 Science and Technology Program
Climate Change and Variability Research Projects**

Type	Title	Lead	2015 Award
Proposals for New Projects			
Competitive	A Web-Based Data Assimilation Framework for Improving Operational Decision Making	Douglas Blatchford	\$ 75,000
Competitive	Intermediate-range Climate Forecasting to Support Water Supply and Flood Control with a Regionally Focused Mesoscale Model	Eric Rothwell	\$ 55,000
Competitive	Soil-Water-Balance Recharge Estimates for the Upper Colorado River Basin under Climate Change	Subhrendu Gangopadhyay	\$ 50,000
Competitive	Evaluating Future Agricultural Water Needs using Integrated Modeling Methods	Jennifer Johnson	\$ 44,350
Competitive	Conveying Climate Change and Variability	Deena Larsen	\$ 17,920
Directed	Center for Western Weather and Water Extremes - Atmospheric River monitoring and forecasting research	Marty Ralph	\$ 100,000
Directed	Developing a Fee-Based Business Model for Climate Change Training	Rich Jeffries	\$ 50,000
Directed	UCAR PWP5 - Residence-to-Virtual Course Conversions supporting Climate Science and Water Resources Distance Learning Efforts	Wendy Abshire	\$ 50,000
Directed	Reclamation Reservoir Operators engagement in NCAR research to improve short-term streamflow prediction (UCAR PWP3 and PWP10)	TBD	\$ 40,000
Directed	Reclamation PN and Technical Service Center Support - Research Roadmapping on user needs for modeling Groundwater Interactions with Surface Waters in a Changing Climate	Jennifer Johnson	\$ 35,000
Directed	Reclamation Technical Service Center - Support to develop 4th edition Climate Change Literature Synthesis	M. Spears	\$ 20,000
		New Projects Total	\$ 537,270
Continuing Projects			
Competitive	Effects of Climate Change and Reservoir Operations on Riparian Vegetation	Blair Greimann	\$ 80,000
Competitive	Flood Frequency Variability on Seasonal to Multidecadal Time Scales in the Western US and Implications for Infrastructure Planning	Subhrendu Gangopadhyay	\$ 64,985
Competitive	Enhancing Predictions of Climate Change Impacts on Snow Distribution and Melt Patterns in the Mountain West	Ted Day	\$ 56,000
Directed	UCAR PWP10 An Experimental Demonstration and Evaluation of Real-time, Over-the-Loop Streamflow Forecasting	Martyn Clark	\$ 150,000
Directed	UCAR PWP 7 Development of Methods to Assess the Hydrological Impacts of Climate Change over the Contiguous United States	Martyn Clark	\$ 150,000

**FY 2015 Science and Technology Program
Climate Change and Variability Research Projects**

Type	Title	Lead	2015 Award
Directed	UCAR PWP11 Climate science and water resources distance learning efforts and customized courses: Less Technical Professional Development Series	Wendy Abshire	\$ 100,000
Directed	Reclamation Technical Service Center - Instructional support for UCAR COMET Climate Training efforts	Blair Greiman	\$ 50,000
Directed	Reclamation Technical Service Center - Climate Projection Downscaling Support	Tom Pruitt	\$ 50,000
Directed	Reclamation Technical Service Center - Modeling support for "Airborne Snow Observatory - Value of Information during Snowmelt Management in western Colorado", partnering with NASA JPL	Todd Vandegrift	\$ 18,000
Continuing Projects Total			\$ 718,985
TOTAL AWARD			\$ 1,256,255

**FY 2015 Science and Technology Program
Invasive Zebra and Quagga Mussel Research Projects**

Type	Title	Lead	2015 Award
Proposals for New Projects			
Competitive	Predicting Mussel Invasions with Predictive Modeling	Denise Hosler	\$ 50,000
Competitive	Studying the Morphology of Invasive Mussel Veligers Using 3D Models Created With a Scanning Electron Microscope	Audrey Rager	\$ 26,000
Competitive	Using Microsatellite Analysis to Track Changes in Quagga Mussel Populations in the Western United States	Sherri Pucherelli	\$ 20,000
Competitive	Using Freshwater Sponge Chemical/Mechanical Defense as a Bio-Control for Mussel Settlement	Kevin Bloom	\$ 18,472
Competitive	Movement of quagga mussel DNA by migratory birds	Rick Wydoski	\$ 15,000
		New Projects Total	\$ 129,472
Continuing Projects			
Competitive	Optimization of Turbulence Generation System to Prevent Invasive Mussel Colonization within Pipelines	Josh Mortensen	\$ 93,000
Competitive	Testing ability of widely used fish screens to resist quagga mussel fouling	Cathy Karp	\$ 85,000
Competitive	Life history and ecological impacts of quagga mussels in Lake Havasu, Lower Colorado River	Cathy Karp	\$ 77,000
Competitive	Antifouling Coatings for Invasive Mussel Control	Allen Skaja	\$ 69,800
Competitive	Performance Testing for Polymerase Chain Reaction Assays	Kevin Kelly	\$ 48,398
Competitive	Field Scale-up testing of Foul Release Coatings	David Tordonato	\$ 18,000
Directed	Zebra and Quagga Mussel Pulse Pressure Technology	Joseph Kubitschek	\$ 1,116,277
		Continuing Projects Total	\$ 1,507,475
	TOTAL AWARD		\$ 1,636,947

**FY 2015 Science and Technology Program
Renewable Energy and Energy Conservation**

Type	Title	Lead	2015 Award
Proposals for New Projects			
Competitive	Implementing Noise Engineering Controls in larger powerplant	Theresa Gallagher	\$ 200,000
Competitive	Shear Pin Failure Prediction Through the Use of Acoustic Emission Sensing and Analysis	John Germann	\$ 84,952
Competitive	Cavitation Detection Technology for Optimizing Hydraulic Turbine Operation and Maintenance	John Germann	\$ 82,340
Competitive	Non-dispatchable Renewable Integration	Jim DeHaan	\$ 45,000
Competitive	Use of Natural Ester Oil as a Dielectric for Power Transformers	Benjamin Few	\$ 45,000
Competitive	Hydropower Research Roadmap - Mechanical and Electrical	Josh Mortensen	\$ 40,000
Competitive	Large Synchronous Generators Computer Models	Jim DeHaan	\$ 35,000
Competitive	Develop advanced engineering controls for further noise reduction in Chandler and Roza or in Seminole Powerplants	Theresa Gallagher	\$ 30,000
Competitive	Power System Safety	Jim DeHaan	\$ 30,000
Competitive	Penstock Air Vent Analysis	Josh Mortensen	\$ 29,008
Directed	Remote Community Renewable Energy Partnership	Erin Foraker	\$ 100,000
Directed	Examine use of SF6 transformers for Reclamation Facilities	Jay Boggess	\$ 60,000
Directed	Scoping Efficiency and Energy Benefits using Performance Testing	ONRL	\$ 50,000
Directed	Demonstration Performance Testing at Flaming Gorge Powerplant	David Hulse	\$ 30,000
Directed	Improved Economic Analysis for Facility Scale Renewable Energy, Training, and Improved Hydropower Models	David Harpman	\$ 25,000
		New Projects Total	\$ 886,300
Continuing Projects			
Competitive	Power System Diagnostics	Erin Foraker	\$ 105,000
Competitive	Plant Condition Monitoring	Jim DeHaan	\$ 100,000
Competitive	Reduced Cost Maintenance	Benjamin Few	\$ 95,000
Competitive	Value Attributes in Pump Generation Plants	David Harpman	\$ 92,000
Competitive	Evaluation of Hydro-Kinetic Impacts to Existing Water Delivery and Power Infrastructure	Josh Mortensen	\$ 53,250
Competitive	Protection System Testing Improvements	Jim DeHaan	\$ 45,000
		Continuing Projects Total	\$ 490,250

FY 2015 Science and Technology Program
Renewable Energy and Energy Conservation

Type	Title	Lead	2015 Award
	TOTAL AWARD		\$ 1,376,550

FY 2015 Science and Technology Program

Sustainable Water Infrastructure and Safety Research Projects

Type	Title	Lead	2015 Award
Proposals for New Projects			
Competitive	Three-Dimensional (3D) Scanning to 3D Printing Technology Development	David DJ Bandrowski	\$ 95,000
Competitive	Trinity Intake Tunnel ROV Photogrammetry Analysis	Matthew Klein	\$ 95,000
Competitive	Potentiodynamic Polarization Testing of Zinc Anodes in Natural Waters	Roger Turcotte	\$ 84,000
Competitive	Underwater Cure Polymeric Repairs to Seal Seepage Cracks	Veronica Madera	\$ 80,000
Competitive	Composites Research Roadmap	Lee Sears	\$ 74,500
Competitive	Mobile Information Collection Application (MICA) Implementation Plan	Jessica Torrey	\$ 73,500
Competitive	Novel Methods for the Detection of Corrosion on Rebar in Concrete	Jessica Torrey	\$ 65,000
Competitive	Finding a Green Alternative to Vinyl Resin Coatings	David Tordonato	\$ 60,000
Competitive	Cracked Embankment Erosion Research	Peter Irely	\$ 40,000
Competitive	Demonstration Project to Implement Electro-Osmotic Pulse (EOP) Technology to Satop Water Leaks Through Concrete	Daryl Little	\$ 39,000
Competitive	Evaluating Methods to Seal Leaking Contraction Joints in Dams	David Starbuck	\$ 37,500
Competitive	Coal Tar Enamel & Coal Tar Epoxy Materials Analysis and Performance History	Bobbi Jo Merten	\$ 36,000
Competitive	Extending the Useful Service Life of Wire Hoist Ropes using Nondestructive Testing	Daryl Little	\$ 35,000
Competitive	Integrating Reclamation's Mission in the National Wildland Fire System	Chuck Dillon	\$ 30,000
Competitive	Corrosion Mitigation System Monitoring	Jessica Torrey	\$ 27,500
Competitive	Comparative Analysis on Reducing Concrete Shrinkage and Cracking	Katie Bartojay P.E.	\$ 25,000
Competitive	Investigating Techniques for Sealing Small Cracks in Thick Concrete	David Starbuck	\$ 22,500
Competitive	Developing efficient and smart protocols for conducting JHAs	Jennifer Johnson	\$ 20,500
Competitive	Safety Practices & Protocols for Natural Resources Field Investigators	Allyn Meuleman	\$ 20,500
Competitive	Photogrammetry App for Roughness Profile	Matthew Klein	\$ 20,000
Competitive	Utilizing Drones to Survey Elephant Butte Dam - Aging Infrastructure and Safety	Mike Landis	\$ 20,000
Competitive	Evaluating Filter Material and Water Chemistry for Potential of Promoting Bacterial Growth Resulting in Clogged Drains	Audrey Rager	\$ 20,000
Competitive	Develop GPS/GIS-enabled Tablet Applications to Modernize Resources and Facility Condition Monitoring	Steve Jalbert	\$ 20,000

FY 2015 Science and Technology Program

Sustainable Water Infrastructure and Safety Research Projects

Type	Title	Lead	2015 Award
Competitive	Photogrammetric Tools for Condition Assessment of Reclamation Structures	Matthew Klein	\$ 15,000
		New Projects Total	\$ 1,055,500
Continuing Projects			
Competitive	Reclamation Infrastructure Sustainability Research Roadmapping	Bobbi Jo Merten	\$ 100,000
Competitive	Moisture Content Requirements for Effective Concrete Repairs	Kurt Von Fay	\$ 95,000
Competitive	Coating Service Lifetime Evaluation by Electrochemical Impedance	Bobbi Jo Merten	\$ 44,400
Competitive	Verification that Type V Cement is required for CLSM with high sulfate native soils	Janet White	\$ 28,000
Competitive	Leaching Lithium	John Robertson	\$ 19,000
Competitive	Use of Aqualastic to encapsulate degraded RCC Lining in Canals	Kathy Kihara	\$ 2,000
		Continuing Projects Total	\$ 288,400
TOTAL AWARD			\$ 1,343,900

**FY 2015 Science and Technology Program
Regional Director Research Projects**

Type	Title	Lead	2015 Award
Proposals for New Projects			
Directed	LC - 2014 Las Vegas Wash Time-of-Travel Study	Kevin Kelly	\$ 34,348
Directed	MP - Effectiveness of a Delta Cross Channel Graduated Field Electrical Fish Barrier to Reduce Movement of Adult Fall-run Chinook Salmon from the Mokelumne River into the Sacramento River, CA	Zak Sutphin	\$ 180,000
Directed	PN - Employee Safety Benchmarking Study	Jennifer Johnson	\$ 100,000
Directed	UC - Evaluating an Innovative Fish Weir for Preventing Fish Entrainment	Mark McKinstry	\$ 100,000
Directed	GP - Evaluation of improving water quality in reservoirs with aeration and oxygenation of associated canals.	Collins Balcombe	\$ 87,000
Directed	MP - Evaluation of Land Subsidence Impacts Due to Groundwater Pumping Near the Delta-Mendota Canal	Jobaid Kabir	\$ 75,000
Directed	GP - Evaluation of methods to mitigate nitrosamines in regional rural water systems	Collins Balcombe	\$ 20,086
Directed	LC - Evaluation of Project Management Solutions	Nathaniel Gee	\$ 20,000
		New Projects Total	\$ 616,434
Continuing Projects			
Directed	PN - Fire Impacts to Watersheds	Chuck Dillion	\$ 10,000
Directed	LC - Canal Seepage Detection Methods	Nathaniel Gee	\$ 10,000
Directed	MP - Data Needs Proposal	Dave Mooney	\$ 30,000
Directed	MP - Ecosystem Indicators	Rod Wittler	\$ 25,000
		Continuing Projects Total	\$ 75,000
TOTAL AWARD			\$ 691,434

FY 2015 Science and Technology Program

Water Operations and Decision Support Research Projects

Type	Title	Lead	2015 Award
Proposals for New Projects			
Competitive	Fostering Data Stewardship Best Practices in Reclamation	Douglas Clark	\$ 180,000
Competitive	Time Series Web Service -- water.usbr.gov	Karl Tarbet	\$ 53,000
Competitive	Developing and Maintaining a Community of Interest Dedicated to the Potential Uses of Near Remote Sensing and Unmanned Aerial Systems (UAS) Technologies within the Bureau of Reclamation (Reclamation) to Reduce Costs and Add Technical Capacity	Douglas Clark	\$ 37,000
Competitive	Electronic Emergency Action Plan Application	Grant Sorensen	\$ 30,000
Competitive	Investigation of Software Tools for Visualization of Results from Water Resources Planning Models	Thomas FitzHugh	\$ 25,000
Competitive	Improving Reclamation's Capacity to Disseminate Information and Receive Feedback	Douglas Clark	\$ 20,000
Competitive	Structure from Motion Photogrammetry: Constructing 3 Dimensional Structure from Ordinary Photography	Eric Peterson	\$ 17,000
Competitive	Use of a Continuous Simulation, Process-based Model to Predict Sediment Inflow in Unsurveyed Reservoirs	Joel Murray	\$ 12,000
		New Projects Total	\$ 374,000
Continuing Projects			
Competitive	Continued Field Measurement of Riparian ET, Lower Colorado River Basin	Ian Ferguson	\$ 94,780
Competitive	Analysis of infrequent large groundwater recharge events: Their importance for long-term groundwater availability, use, and management	Subhrendu Gangopadhyay	\$ 75,000
Competitive	Improved Estimation of Reservoir Evaporation	Mark Spears	\$ 62,000
Competitive	Application of a Physically-Based Distributed Snowmelt Model in Support of Reservoir Operations and Water Management	Ted Day	\$ 41,000
Competitive	Comparison of physical observations and simulations of air entrainment	James Higgs	\$ 39,200
		Continuing Projects Total	\$ 311,980
	TOTAL AWARD		\$ 685,980

FY 2015 Science and Technology Program

Environmental Issues in Water Delivery and Management Research Projects

Type	Title	Lead	2015 Award
Proposals for New Projects			
Competitive	Helix Downstream Fish Passage Design	Leslie Hanna	\$ 158,000
Competitive	Field Testing and Calibration of a Hydrophone System for Surrogate Bedload Measurement	Robert Hilldale	\$ 101,500
Competitive	Signal Processing From Bedload Impact Plates Instrumented With an Accelerometer	Robert Hilldale	\$ 98,000
Competitive	An Integrated Modeling Tool to Assess Mercury Transport and Transformation Processes at Reservoirs	Yong Lai	\$ 85,000
Competitive	Application of New Discounting Approaches for Long-Lived Water Resource Investments	David Harpman	\$ 81,000
Competitive	Can a numerical model simulate observed patters of gravel dispersion based on river bed morphology and flow hydraulics?	D. Nathan Bradley	\$ 63,000
Competitive	Synthesis of Ecological and Physical Effects of Dam Removal Projects	Jennifer Bountry	\$ 62,000
Competitive	Evaluation of a new PIT tag antenna for large, deep, flashy river/canal systems	Cathy Karp	\$ 40,000
Competitive	Developing tool to assess model uncertainty in sediment simulation	Blair Greimann	\$ 35,000
Competitive	Ephemeral Tributary Sediment Transport Measurement	David Varyu	\$ 26,000
Competitive	Seismic Monitoring of Bedload Transport in Large Gravel-bed Rivers	David Gaeuman	\$ 24,050
Competitive	The Development of a Bonytail Fish Population in Lake Mead or Lake Powell	Mark McKinstry	\$ 20,000
Competitive	Researching a Concept for a Self Regulating Articulated Fishway 2	Dale Lentz	\$ 19,000
Competitive	Advanced Algorithms and Workflows for Ecohydraulic River Restoration Design	Blair Greimann	\$ 15,000
Competitive	Effect of Electric Fish Barriers on Corrosion and Cathodic Protection	Daryl Little	\$ 15,000
Competitive	Groundwater Model Coupling to Reclamation Surface Water Models	Sean Kimbrel	\$ 10,000
		New Projects Total	\$ 852,550
Continuing Projects			
Competitive	Quantitative Modeling Tools of Scour and Morphological Impact due to Large	Yong Lai	\$ 80,000
Competitive	Federal Interagency Sedimentation Project	Robert Hilldale	\$ 24,000
		Continuing Projects Total	\$ 104,000
	TOTAL AWARD		\$ 956,550