

RECLAMATION
Managing Water in the West

Prize Competitions

A Tool for Solving Tough Issues and
Advancing Research



Reclamation R&D Objectives

- Improved Decision Making
- Increased Water Deliveries
- More Hydropower Generation
- Better Environmental Compliance
- Longer Infrastructure Life
- Improved Worker Safety
- Reduced Maintenance Costs



Reclamation R&D Programs

- **Address Technical Challenges in:**

- water infrastructure
- power and energy
- environmental issues in water mngt.
- water operations and planning
- developing water supplies

- **Customers**

- Reclamation facility managers and resource managers, customers, stakeholders, private sector, public

- **Programs**

- Desalination & Water Purification
- Science & Technology
 - Research
 - **Prize Competitions**
 - Technology Transfer



<https://www.usbr.gov/research/>

Preview

- **History, Overview, and Goals of Reclamation Prize Competitions**
- **Reclamation's upcoming plan of prize competitions, and those potentially of interest to CAMT**
- **Opportunities to get involved, partnering examples**

2015 Desal Prize (USAID lead)

- Challenge: treat brackish groundwater for rural and underdeveloped areas
- Success Criteria: potable and irrigation water volumes, renewable energy-powered, demo. at Reclamation's facility
- Winners: two sharing \$200K, additional \$400K grants
 - Bloomberg "Burning Man for Water Geeks"
- Maturing Solutions: winner & manufacturer partnering to commercialize

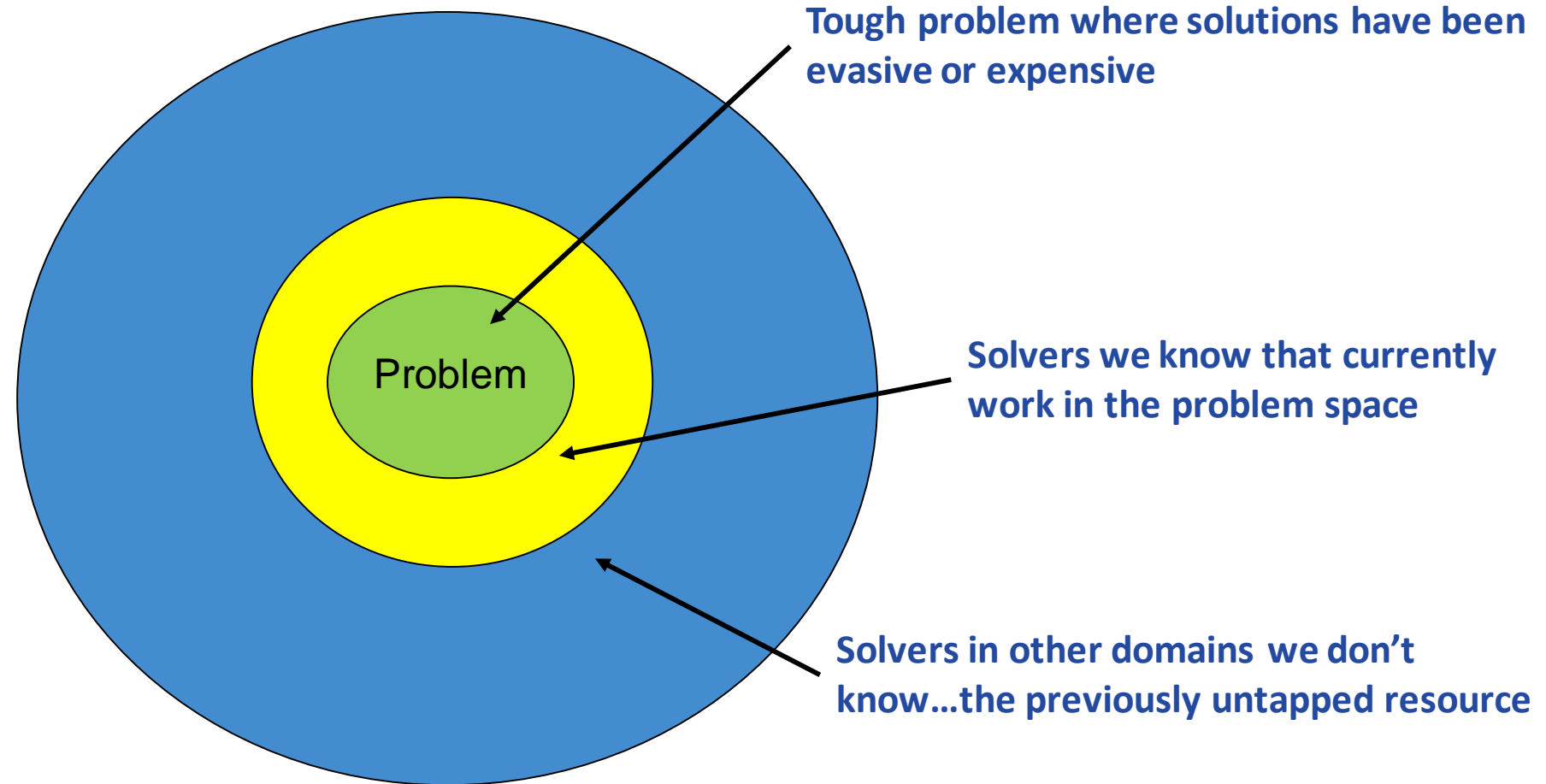


Prize Competitions in Reclamation



- **Crowdsource solutions, reset research, accelerate prototyping to use, promote growth**
- **Theme Areas:**
 - Water Availability
 - Infrastructure Sustainability
 - Environmental Compliance
- **History & Status:**
 - 20 launched since FY15
 - 11 planned for launch during FY19-20
 - Focusing more on prototyping and demonstration events in the field
- **Federal and non-Federal partners**

Why Prize Competitions?

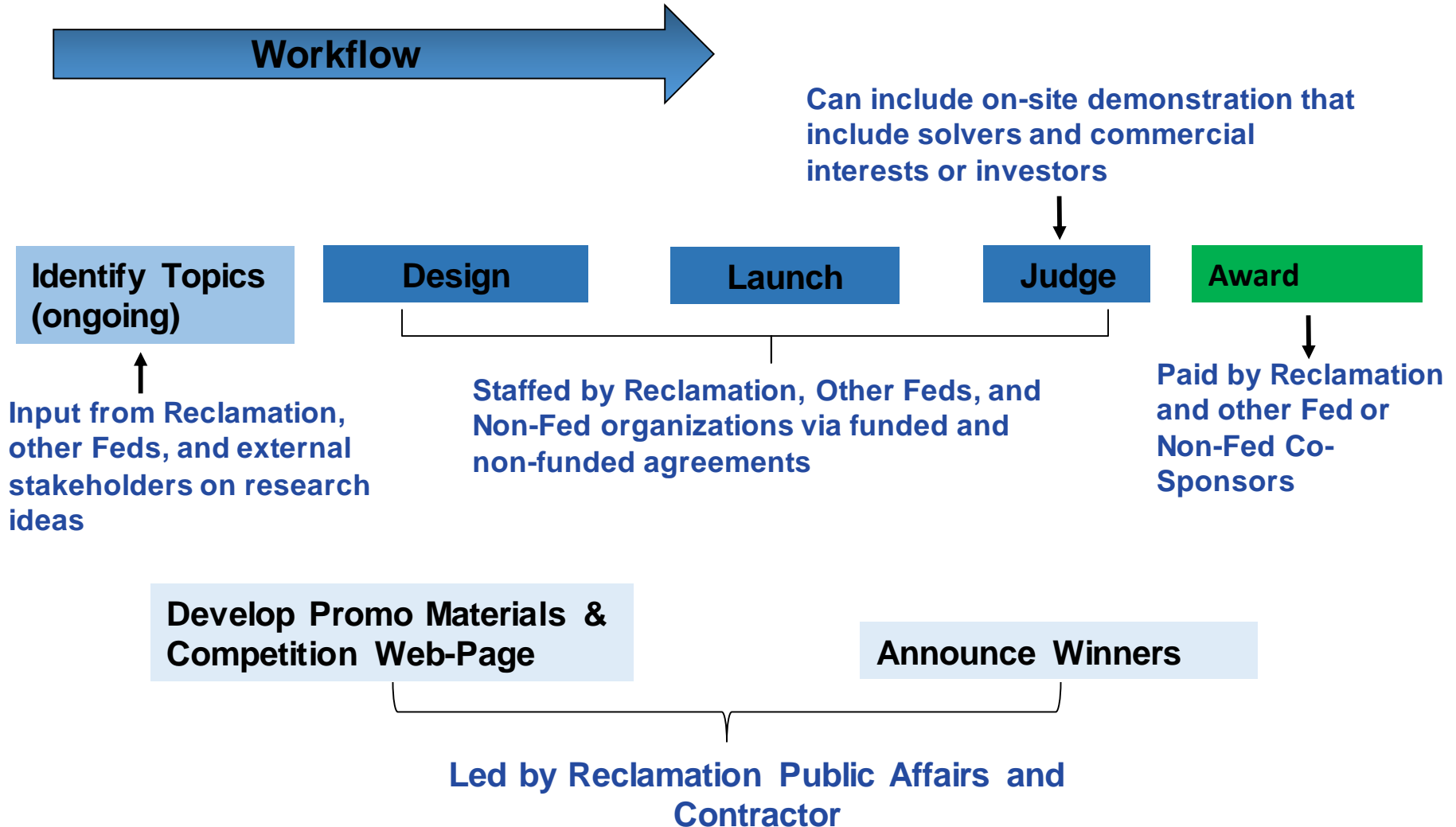


Crowd Sourcing for Solutions

How Prize Competitions Work

- **Issue a national or international challenge to solve a specific, difficult, technical problem.**
- **Establish monetary and/or non-monetary incentive prizes.**
- **Set the “Bar of Success” – winners’ submissions must satisfy success criteria established by sponsoring agency, and beat the performance of competitors**

General Process



Prize Outcomes

- **Depends upon the Design and Goals**
- **Starting Point or Reset for Research**
- **Demonstrated Prototype**
- **Partners for maturing solutions**

Example: Mussels Eradication in Open Water Competition

- Challenge: eradicate invasive zebra and quagga mussels from large reservoirs, lakes and rivers
- Success Criteria:
 - Species specificity
 - Cost effectiveness
 - Minimal impact to ecosystem
 - Scalable
- Winners: three, \$100K total
- Maturing Solution:
 - Cooperative Agreement with Biomilab, LLC.



Competition Partners

Molloy & Associates, LLC

Portland State University

U.S. Army Corps of Engineers

USGS

Example: Sub-Seasonal Forecast Rodeo I

- Challenge: Year long, real-time sub-seasonal forecasting competition
- Success Criteria: beat skill of federal forecasts, real-time and history
- Winners: three, \$525K total
- Maturing Solutions: NOAA evaluating winning solutions for application; two other teams withdrew and partnered to commercialize their techniques.

Weeks 3&4 Temperature

Team	Newest Score	Average Score
bgzimmerman	-0.0994	0.2855
proxix	-0.1821	0.2265
StillLearning	0.029	0.217
DampedPersistence	-0.0794	0.1952
CFSv2	-0.3997	0.1589
asanteko2000	-0.1117	0.0909
lupoa13	-0.2187	0.0895
Salient	0.05	-0.1365

Weeks 3&4 Precipitation

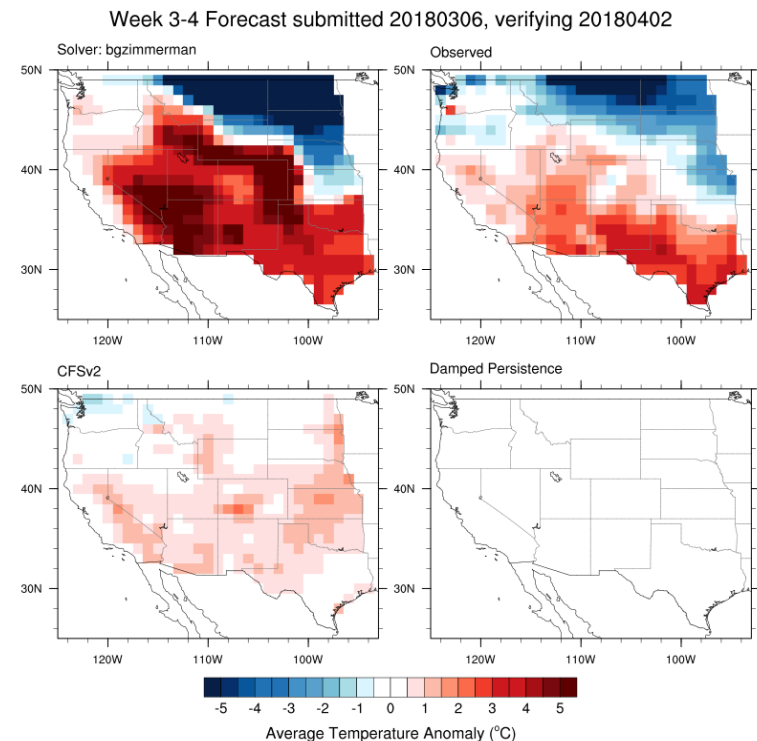
Team	Newest Score	Average Score
Salient	0.7758	0.2144
proxix	0.0921	0.1711
lupoa13	-0.1367	0.1246
CFSv2	0.1837	0.0713
StillLearning	0.7987	0.0227
bgzimmerman	0.1087	-0.0221
asanteko2000	-0.7981	-0.0612
DampedPersistence	-0.7996	-0.1463

Weeks 5&6 Temperature

Team	Newest Score	Average Score
bgzimmerman	-0.4472	0.2357
CFSv2	0.5267	0.2192
StillLearning	0.1436	0.2044
proxix	0.3105	0.2026
lupoa13	-0.5854	0.1675
asanteko2000	-0.1046	0.0897
DampedPersistence	0.1084	-0.0762
Salient	-0.8229	-0.09

Weeks 5&6 Precipitation

Team	Newest Score	Average Score
Salient	0.5897	0.2162
proxix	0.0995	0.1208
StillLearning	0.5816	0.0941
lupoa13	0.0916	0.0931
bgzimmerman	0.303	0.0773
CFSv2	0.0692	0.0227
asanteko2000	-0.5561	-0.0879
DampedPersistence	-0.4375	-0.1613



Competition Partners

NOAA (NIDIS [Leaderboard](#))

California Dept. of Water Resources

U.S. Army Corps of Engineers

USGS

Program Flexibility

- **NASA CoECI Interagency Agreement**
 - access to Open Innovation Services Contract → niche solver communities!
- **Continue to Identify Topics for Competitions**
- **Continue to Seek Partners**



Upcoming Competitions

Prize Title	Planning-Launch
Long-Term Corrosion Protection of Existing Hydraulic Steel Structures - Stage 2	Launch Aug. 2019
More Water Less Concentrate- Stage 2	FY19Q3 - FY20Q1
Arsenic Sensor - Stage 2	FY19Q4 - FY20Q2
Reservoir Sediment Management - Stage 2	FY20Q1 - FY20Q2
Water Temperature Management D/S from Dams - Stage 1	FY20Q2 - FY20Q3
Improving Canal Safety	FY20Q2 – FY20Q4
Improving Fish Exclusion from Diversions and Intakes – Stage 2	FY20
Lowering the Cost of Continuous Streamflow Monitoring - Stage 2	FY20Q1 - FY20Q3

Partnering Opportunities

- **Identifying Technical Challenges**
- **Providing experts to help design & judge**
- **Hosting competition events (facilities, in the field)**
- **Outreach and promotion**
- **Prize purses or other incentives**

Summary

- **Since 2015, Reclamation has used Prize Competitions to crowdsource science and technology solutions in water availability, infrastructure, and environmental compliance**
 - fresh starting points for research
 - accelerating prototyping to use
- **Reclamation has several upcoming competitions related to fisheries that may interest CAMT.**
- **Partnering opportunities exist in identifying challenges, designing competitions, judging, hosting, sponsoring prizes, outreach, maturing solutions, etc.**



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Learn more and view past, current, and upcoming competitions:

www.usbr.gov/research/challenges