

Guardians of the Reservoir Challenge

Presented by
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Guardians of the Reservoir Challenge

Sponsors

- Bureau of Reclamation



- U.S. Army Corps of Engineers (USACE)



Contractors

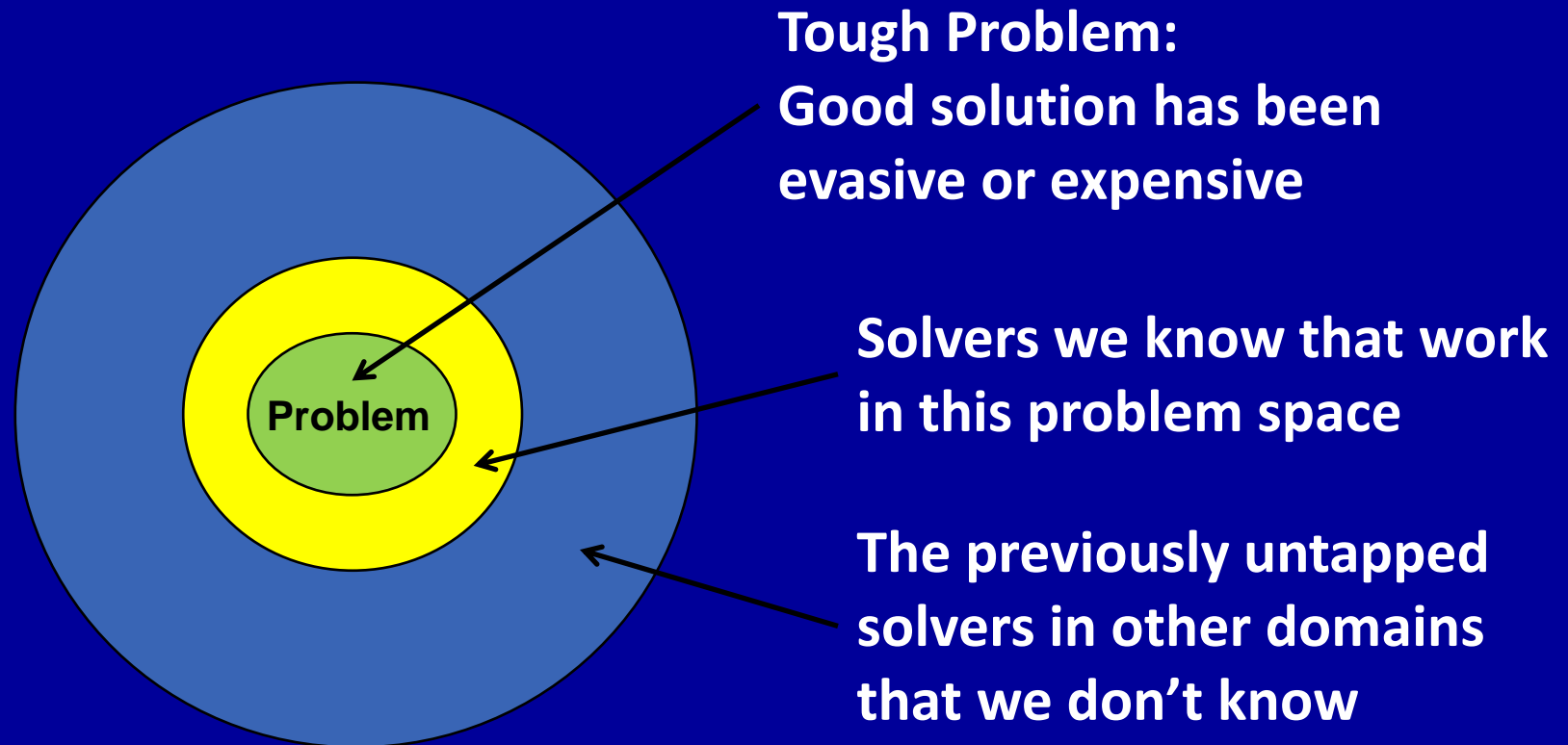
- NASA's Tournament Lab



- HeroX



- **Research prize challenges address tough problems, where solutions have been evasive or expensive, by opening the problem area to previously untapped domains**



Challenge Goal

- Develop and demonstrate new processes and technologies.
- Looking for technologies that will annually move sediment downstream.
- Technologies that would regain lost reservoir storage capacity would be of interest if environmentally acceptable.



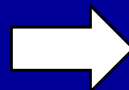
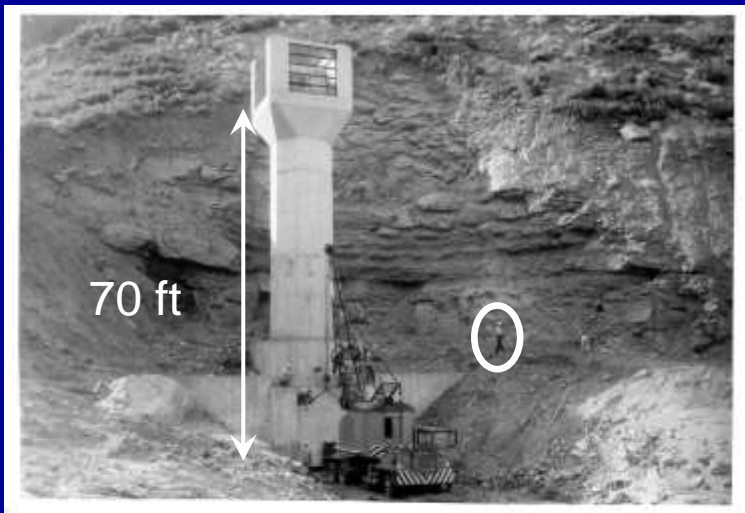
Challenge Objective

- Ask a global community of solvers to find an innovative solution.
- Identify the most promising ideas and help to develop them.
- Connect promising technologies with industrial partners.



Background

- Part of a larger sustainability effort to maintain our nation's reservoirs, which are part of the nation's aging infrastructure.
- Raising awareness about the problem of reservoir sedimentation.



**July
1961**



**Paonia
Reservoir, CO**

**November
2014**

Challenge Prize

- Up to \$550,000 in cash prizes shared among winners.
- The authors of the most compelling submissions will have the opportunity to develop and demonstrate their technologies at increasing scales for the Challenge sponsors.
- The Challenge will be conducted in three phases.



Challenge Prize

- Challenge offers development support and field-testing opportunities to the most compelling ideas.



Challenge Phase 1

- Everyone is invited to participate in Phase 1.
- Submissions must be received by October 20, 2020.
- As many as 5 of the most compelling submissions will each receive \$75,000 and advance to Phase 2.
 - \$50,000 at the beginning of phase 2
 - \$25,000 after successful completion of their mid-point check-in

Challenge Phase 2

- Development period: December 8, 2020 - February 15, 2022
- Phase 1 winners have about 15 months to work according to their proposed project plans, develop their proposed approaches, perform a laboratory-scale demonstration, and submit a report.
- Up to 3 of the top-performing teams will advance to Phase 3 and each will receive an additional \$25,000.

Challenge Phase 3

- Demonstration period: April 5 - June 10, 2022
- Phase 2 winners have 9 weeks to prepare for a large-scale demonstration, where they will set up and run their demonstration for Reclamation, USACE, and their partners.
- At a final demonstration event, teams will present an overview of their work to Reclamation, USACE, and possibly affiliated commercial partners.
- The final winner will receive \$100,000 cash award.

Limitations of Current Methods

- Expense
 - Dredging can cost more than \$20/yd³
- Durability and reliability
 - Sand and gravel can be very abrasive, causing equipment failure and downtime
- Versatility
 - Reservoirs have different shapes and sizes and many have depths greater than 50 ft
- Water loss
 - Reservoir flushing or sluicing uses valuable water storage

Ideal Challenge Solutions

- Applicable to a wide range of sediment types and reservoir geometries.
- Solutions that specifically address a targeted issue, such as sediment collection or transport, deeper reservoirs, more cohesive sediments, or very abrasive sediments are also of great interest.
- Reclamation and USACE are interested in innovative approaches that may have additional capabilities over existing sediment removal solutions.

Solution Constraints



- Must not cause significant reservoir drawdown.
- Must be able to coexist with recreational activities, without limiting access to large areas of the reservoir or endangering visitors.
- Should not release harmful materials into the water or the air and should not endanger wildlife.



Ideas should consider the following

- Technical maturity
 - Develop and demonstrate within Phase 2 (15 months)
- Practicality and scalability
 - Able to implement within a real reservoir
- Expense
 - Cost to implement idea would be less than the cost of current methods or at least comparable
- Novelty
 - Looking for new and innovative ways of thinking about the problem

Here is How to Become a Solver

- To accept the challenge, visit <https://www.herox.com/GuardiansoftheReservoir>
- The prize is open to anyone aged 18 or older participating as an individual or as a team.

