



Better, Faster, Cheaper: Measuring Reservoir Capacity

When: Planned Launch Fall 2016

Problem Statement: Sediment deposition in reservoirs - or the accumulation of particles like pebbles, sand, mud, and salts carried by wind, water, or ice - limits the active life of reservoirs by reducing storage capacities and impacting structures, such as water outlets and intakes.

Accumulating sediments pose a significant problem for Reclamation in determining how to measure reservoir storage capacities. Repeat reservoir surveys, which measure the long-term problem of reservoir sedimentation, are costly and generally become a lower priority relative to short-term operation and maintenance needs at dams and reservoirs. As of 2015, less than 40% of Reclamation reservoirs had at least one repeat survey since first filling to estimate storage loss as a result of sedimentation. This scarcity of data across Reclamation's inventory of reservoirs presents a gap in assessing future sedimentation impacts at reservoirs that store and deliver water and power.

An alternative to a direct measurement is an indirect estimate of storage loss, or what is defined on a yearly basis as the *mean annual sediment yield*. Sediment yield estimates are generally based on empirical, analytical, or physically-based methodologies. There are many indirect methods available to estimate sediment yield (e.g. regional relationships, soil loss equations, process-based models), but many require extensive resources and yield what is often a less than desirable estimate, especially at reservoirs that have never been surveyed.

Brief description of the potential impact from a successful solution to this problem: Measurement of reservoir storage loss due to sediment accumulation is paramount in supporting Reclamation's mission. Developing an efficient and accurate indirect estimate model of reservoir storage would result in a significant better, faster, and cheaper solution and support Reclamation in meeting water and power deliveries now and into the future.

Prize Competition Scope: This data-driven ideation prize competition is proposed that will solicit new concepts for indirectly measuring storage loss due to sediment accumulation at a variety of reservoir locations. This challenge will rely upon publically available hydrographic and geologic datasets (e.g. National Hydrography Dataset, National Elevation Dataset, NRCS Land Use Data, etc.), and a select set of resurveyed reservoirs will be shared with prospective Solvers for model development and assessment.

Collaborators:

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