



DataApp: A Mobile App Framework for Field Data Capture

When: Planned Launch Spring 2017

Problem Statement: Data collection is fundamental to water and environmental management. Streamflows, reservoir elevations, and flows in canals and conduits, for example, are continuously monitored to support decisions ranging from real-time operations to long-term planning. Data are routinely collected to monitor infrastructure conditions and identify maintenance priorities, and a wide range of environmental data are collected to characterize habitat conditions, monitor fish and wildlife populations, and support ecosystem restoration programs. Scientists, engineers, and technicians are increasingly using mobile devices such as tablets and smartphones to record measurements, document site locations via GPS, and take photos and notes in the field.

Several apps are already available to support general data collection; however, these existing apps do not provide the functionality and flexibility needed to support the broad range of water and environmental monitoring needs. For example, most existing apps are unable to interface with field instruments (e.g., sensors and data loggers), and many have limited options for exporting data. Just as important, these existing apps lack features to encourage and facilitate standardization of data collection across a given community of practice, including data management planning, data and metadata standards, and data collection protocols, all of which significantly improve data quality, transparency, and sharing within and between communities of practice. While some of these limitations have been addressed through the development of custom apps for specific monitoring programs, custom apps are expensive and time consuming, and typically are not transferrable to other programs.

Brief description of the potential impact from a successful solution to this problem: Development of a flexible, extensible, and open source data collection app framework for mobile devices will facilitate the use of mobile devices for field data collection, which in turn will improve data collection efficiency, lower data collection costs, and improve data quality, transparency, and dissemination for applications to management, decision making, and scientific discovery. Flexibility and extensibility will allow the use of mobile devices for across broader range of data collection situations, whereas use of open source software will allow data collection communities of practice to develop common protocols and standards for data collection, management, and sharing.

Prize Competition Scope: This is a “baby” Grand Challenge envisioned to consist of 3 main stages. The decision to proceed to Stage 2 will depend on the results of Stage 1 and other considerations.

- **Stage 1** is a concept challenge requiring a white paper submittal, with a total prize purse of over \$30,000. Stage 1 will focus on outlining software architecture concepts and technologies for the app framework
- **Stage 2** is envisioned as a subsequent theoretical challenge requiring a white paper submittal, with a total prize purse of over \$60,000. Stage 2 will focus on designing and visualizing the app framework using UML and wireframe diagrams.
- **Stage 3** is envisioned as a Reduction-to-Practice requiring submittal of a working app framework prototype, with a total prize purse of \$100,000.

Reclamation also plans to invite industry, non-profit organizations, and venture capital representatives to participate as partners and/or, official judges of this competition and seek potential business deals with competition participants.

Collaborators:

