

Opportunity Title: Expanding hydrologic insight with satellite remote sensing

Opportunity Reference Code: IC-17-12

Organization Office of the Director of National Intelligence (ODNI)

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How to Apply **Create and release your Profile on Zintellect** – Postdoctoral applicants must create an account and complete a profile in the on-line application system. **Please note: your resume/CV may not exceed 2 pages.**

Complete your application – Enter the rest of the information required for the IC Postdoc Program Research Opportunity. The application itself contains detailed instructions for each one of these components: availability, citizenship, transcripts, dissertation abstract, publication and presentation plan, and information about your Research Advisor co-applicant.

Application Deadline 3/31/2017 6:00:00 PM Eastern Time Zone

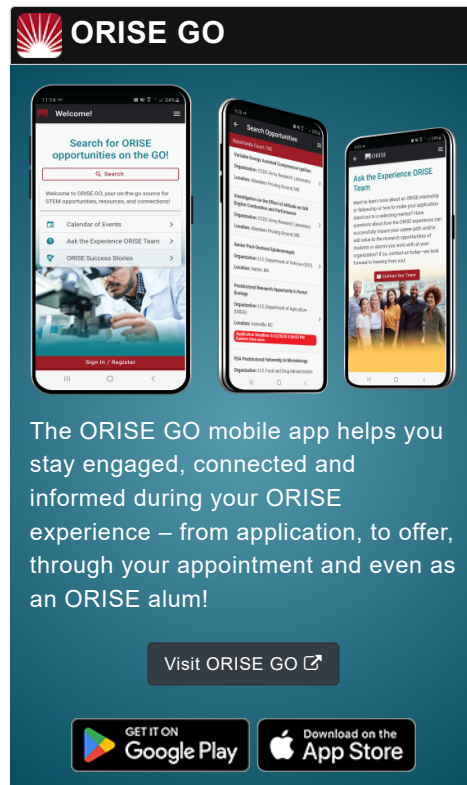
Description **Research Topic Description, including Problem Statement:**

Traditional hydrology and hydrogeology datasets include field-based data from well logs, pumping experiments, tracer experiments, stream gauges, and/or sampling for water quality, isotopic, or other chemical analyses. These methods require frequent site access. In addition, the need for expert installation or expert collection techniques generally limits field area size to what can be visited by a well-trained individual or highly trained small team. The expanding constellation of commercial satellites has increased data availability due to improved revisit time and resolution. As these sensors multiply, the scientific community gains a source of data that does not require physical proximity or expertise in field methods to obtain data useful for many scientific disciplines. Given the expansion of satellite sensors available to the scientific community, there are two questions this postdoc might address: Can hydrologic knowledge/models be improved by expanding or interpolating a traditional dataset using remote sensing data or by fusing remote sensing data and the original data source? Can inaccessible areas or areas with extremely sparse data be analyzed hydrologically with satellite methods?

Example Approaches:

Research approaches could include extrapolating data beyond a small study area, interpolating between sparse samples, fusing two datasets together to reach additional insights, or other approaches that take advantage of remotely sensed data to inform hydrology in novel ways.

Examples could include, but are in no way limited to:



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- Determining how information such as spectral vegetation indices (e.g., NDVI) can be combined with proximal information (e.g., ^{18}O or ^2H data) to increase resolution or interpolate between sample locations.
- Combining Gravity Recovery and Climate Experiment (GRACE) satellite data with well data and/or water age models to assess aspects of regional aquifer recharge.
- Using remotely sensed data in conjunction with sampled water quality analyses to assess available potable water for developing regions or nations.

**Eligibility
Requirements**

- **Citizenship:** U.S. Citizen Only
- **Degree:** Doctoral Degree.
- **Discipline(s):**
 - **Business** (11 )
 - **Chemistry and Materials Sciences** (12 )
 - **Communications and Graphics Design** (6 )
 - **Computer, Information, and Data Sciences** (16 )
 - **Earth and Geosciences** (21 )
 - **Engineering** (27 )
 - **Environmental and Marine Sciences** (14 )
 - **Life Health and Medical Sciences** (45 )
 - **Mathematics and Statistics** (10 )
 - **Other Non-Science & Engineering** (13 )
 - **Physics** (16 )
 - **Science & Engineering-related** (1 )
 - **Social and Behavioral Sciences** (28 )