

Opportunity Title: Quantifying and Assessing Soil Quality as an Indicator of

Regional Stability

Opportunity Reference Code: IC-17-11

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 11:59:00 PM Eastern Time Zone

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

Recent regional events suggest that soil quality can be a contributing factor for regional stability. Negative changes in soil quality can lead to loss of economic and food security, manifesting in increased risk of human conflict. However, this understanding of short and long term impacts of soil quality to regional security is incomplete. This is due in part to a lack of precise, accurate, spatially-explicit, and timely ground truth data plus a lack of detailed understanding of how natural and anthropogenic factors combine to influence soil quality. An improved characterization and understanding of soil quality through remotely observing and quantifying the factors affecting soil quality would provide better inputs for developing robust regional stability assessments. Soil quality factors include but are not limited to soil composition, mineralogy, salinity, chemistry, moisture, depth, and availability of nutrients. Other factors affecting soil quality include agricultural mode (e.g., intensive versus subsistence), use of pesticides, herbicides, fertilizers, and fungicides, the use of soil amendments, use of irrigation and source of water as well as non-agricultural pollution sources.

Example Approaches:

This is a complex and wide ranging research area suited to a multidisciplinary approach across soil science, physical geography, human geography, environmental science and agricultural sciences. A key challenge is the identification of specific remotely measurable indicators or factors that affect soil quality and accompanying measurement methods.

Research may involve local and regional studies with ground




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truth data in several environmental and cultural settings. A successful proposal will likely address one or more of the following broad problem areas:

- Determining how to develop a baseline understanding of soil quality so that changes can be detected
- Building local and regional in-situ and remote sensed observation methods to understand and quantify soil quality factors
- Quantifying factors that influence regional soil quality, identifying source(s) and identifying the specific impacts of these factors on soil quality
- Identifying key regional indicators of soil quality.

**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 )