2015 NSF WORKSHOP ON INTELLIGENT SYSTEMS FOR GEOSCIENCES
1-Page Statement
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1) summarize 3-4 big ideas in your field in the last few years that you think may have an impact in geosciences research:

- Crowdsourcing: Leverage contributions from a large group of people, especially from an online community;
- Cloud as a Service: Infrastructure as a service (IaaS), Platform as a service (PaaS), Software as a service (SaaS), Storage as a service (STaaS), Network as a service (NaaS), Information as a service (IaaS), Workflow as a service (WaaS)
- Internet of Things: Link all Things (including any device and human that may be connected) and their relationships (including social networking) to help better understand the world;
- Big Data as a Service: Leverage cloud computing to realize real-time service provisioning.

2) highlight 2-3 important research trends in your area that can be relevant to the workshop goals.

Data-Driven Service Discovery, Recommendation, and Composition

As current satellite measurements rapidly magnify the accumulation of scientific knowledge, new discoveries increasingly require collaborative integration and adaptation of various data-driven software components (tools). In recent years, scientists have learned how to codify tools into reusable software modules that can be chained into multi-step executable workflows. However, although computing technologies continue to improve, adoption via the sharing and reuse of modules and workflows remains a big challenge.

Collaborative Big Data Analytics

Facing the big data challenge, the need for collaborative data analysis increases significantly. Existing data-oriented workflow tools, however, are not suitable to support collaborative design of such a workflow, to name a few, (1) to support real-time co-design; (2) to track how a workflow evolves over time based on changing designs contributed by multiple researchers; and (3) to capture and retrieve collaboration knowledge on workflow design (discussions that lead to a design).

Next-Generation Cloud-Based Service-Centric IDE

One research trend in service oriented computing is to explore the next-generation SOA technology, with an emphasis on open source. Leveraging cloud computing technology, researchers aim to design and develop a shared cloud-based service-centric Integrated Development Environment (C-IDE). Such a C-IDE provides three categories of intelligent facilities. First, the C-IDE will serve as an SOA-based IDE to allow data analytics researchers to find services and compose services to develop workflows and execute workflows. Second, the C-IDE will provide a platform for service providers to publish services, deploy services, and host services effectively and efficiently. Third, the C-IDE will serve as a service market place equipped with search and recommendation engine.