



<http://www.IS-GEO.org>

Site in revision

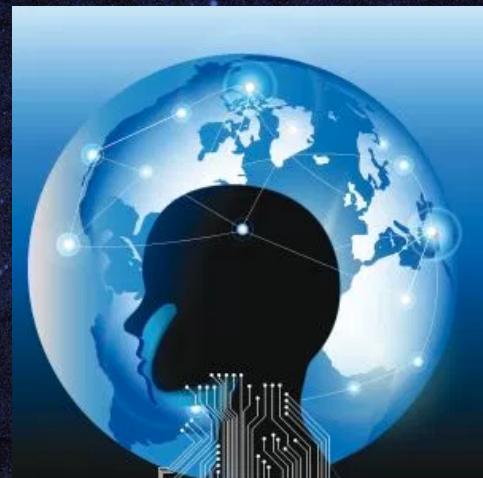
Intelligent Systems with Geosciences



EarthCube RCN IS-GEO: Intelligent Systems Research to Support Geosciences

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UTexas at Austin
Sept 2016 - Aug 2018

IS-GEO Initiative Began:
• 2015 Workshop



IS-GEO has broad membership:

GEO includes:

All earth sciences,
including polar, atmospheric, ocean and geospace sciences.



IS includes:

Knowledge representation, semantics and meta data,
machine learning/statistics/data mining, geospatial computing,
visualization, robotics (for data collection).

The RCN invites interested individuals to join via varying levels of involvement

(Initial plan)

1) Supporting members:

- Informed of all activities
- Help shape activities + provide feedback on needs, ideas, etc. (optional)
- Participate in virtual meetings and activities (optional).
- Anyone can *sign up* to be supporting member.
- We welcome international members!

2) Core members:

- Heavier involvement
- Attend planning + collaboration workshops.
- Must show commitment to become core member (e.g. 1st workshop lead a session)

3) Steering members:

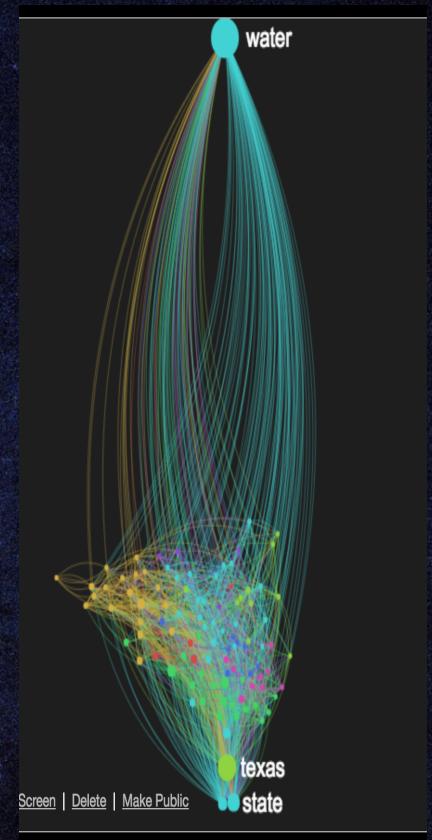
- Leadership involvement
- Actively contribute to strategic implementation + Attend planning + collaboration workshops.
- Supported proposal preparation and project design efforts.

IS-GEO builds on and supports existing communities.

- Already over 35 members
- Steering committee: Omar Ghattas & Basil Tikoff (GEO), Yolanda Gil & Imme Ebert-Uphoff (IS)

- 1) Foster and Grow a Community across IS and GEO
- 2) Identify barriers to research and establish mechanisms to overcome them
- 3) Enhance communication channels between GEO and IS researchers
- 4) Identify Grand Challenges for an IS-GEO Research Vision
- 5) Encourage robust, long-term collaborations between GEO and IS researchers

Primary Goals of IS-GEO



- ▶ **Goal 1: Foster and Grow a Community across IS and GEO**
- ▶ The goal is to foster an active and broad-based IS-GEO research community that supports research activities across the disciplines. To do this, the team will establish a range of activities to encourage connections and networking across IS and GEO.
- ▶ *Objective 1.1:* Establish connections with narrower ongoing efforts, such as existing EarthCube funded projects and the Climate Informatics workshop series to build momentum in the community.
- ▶ *Objective 1.2:* Form an EarthCube Special Interest group on IS-GEO to establish an ongoing space for collaborative efforts within EarthCube.
- ▶ *Objective 1.3:* Reach out to research groups that are pursuing IS-GEO collaborations, which were identified by the IS-GEO workshop participants.

Primary Goals

Goal 2: Identify barriers to research and establish mechanisms to overcome them

- ▶ To streamline interactions and accelerate IS-GEO collaborations, important barriers must be addressed; such as terminology differences among the disciplines involved and highlight key knowledge gaps that hinder collaboration across the disciplines.
- ▶ *Objective 2.1:* Conduct and facilitate workshop sessions that foster substantive dialogue among IS-GEO researchers.
- ▶ *Objective 2.2:* Establish a Working Group for IS-GEO Education to evaluate potential for cross-training of students, researchers and faculty, such as offering tutorials at conferences, summer workshops, asynchronous courses, etc.

Primary Goals

- ▶ **Goal 3: Become the recognized center point for IS-GEO Information Seekers establish and enhance communication channels between GEO and IS researchers**
- ▶ Extend the impact of the *IS-GEO RCN* by becoming the recognized place within the community for researchers and practitioners to find, pursue, and disseminate research ideas and collaboration opportunities.
- ▶ *Objective 3.1:* Extend the established IS-GEO.org website to serve as a central entry point for information about events, resources, and information of use to the community.
- ▶ *Objective 3.2:* Define generalizable geoscience problems and create a repository for grand challenges with associated datasets.
- ▶ *Objective 3.3:* Implement social networking and communication mechanisms for IS-GEO researchers to interact and match skills and problems via meetup boards.

Primary Goals

Goal 4: Identify Grand Challenges for an IS-GEO Research Vision

- ▶ The goals of *IS-GEO RCN* will be to identify grand challenges, while also refining understanding about target areas and topics among the community members. The first objective of the RCN community will be to define key cross-over fields of interest within the IS-GEO community.
- ▶ *Objective 4.1:* Identify grand challenges in the Geosciences that are well suited to IS research.
- ▶ *Objective 4.2:* Identify cutting edge ideas in IS that would benefit geoscience researchers.
- ▶ *Objective 4.3:* Construct a matching and cross-over map to aid researchers seeking collaborative connections and disseminate through the online website/information portal.
- ▶ *Objective 4.4:* Delineate grand challenges and opportunities that are ripe for immediate progress as well as longer term efforts and needs.

Primary Goals

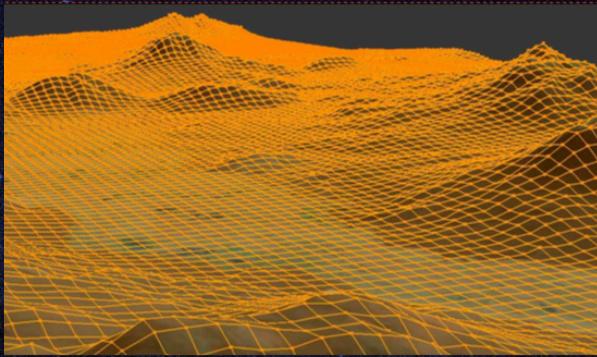
Goal 5: Encourage robust, long-term collaborations between GEO and IS researchers

- ▶ Extend the impact of NSF-funded IS-GEO research by encouraging activities that support awareness and build a knowledgeable community over time.
- ▶ *Objective 5.1:* Form working groups to explore, define, and sustain activities in subtopics of high interest to the community.

Primary Goals

Workshop 1 (January 18-20, 2017)

- 1) Create relationships,
- 2) Dialogue to increase understanding across the fields,
- 3) Begin to learn about important concepts, terms, and topics of interest, and
- 4) Start to collect science drivers and technical details about ongoing IS-GEO collaborations.



- ▶ [Lexithon](#) Challenge to create a glossary of terminology with explanations and examples
- ▶ Define working groups, training modules, datasets and pilot efforts

IS-GEO RCN ACTIVITIES AND TIMELINE
3 face-to-face workshops planned

- Interim Steering Committee Retreats Workshops and symposia proposed in co-location with major conferences, such as AAAI, IJCAI, ICML, KDD, IUI, ISWC, K-CAP, and others.
- AGU 2016 – IS-GEO session and Townhall Event
- AAAI – proposed, but not accepted
- CI – too close this year?
- Regular Teleconference Calls and Contact Points (TBD post workshop 1)

IS-GEO RCN ACTIVITIES AND TIMELINE **Interim Coordination**

IS-GEO RCN ACTIVITIES

- ▶ Hosted 1st Steering Committee Planning Retreat
- ▶ Formed an Early Career Committee

- Michael Christofferson, undergraduate UT-Austin
- Mariana Guerneque, doctoral, UT-El Paso
- Kate Skinner, doctoral, Umich
- Daniel Garijo, postdoc, USC

- ▶ Planned Workshop #1, Jan 18-20, 2017

- ▶ 2 ½ days Draft Agenda [here](#)

- ▶ RCN Presentations at

- ▶ GSA 2016 full session



You will be able to find links at the main
is-geo.org webpage

- The workshop agenda is available here:

<https://goo.gl/FKu52x>

- A wiki with the main discussions and materials resultant from the meeting is available here:

http://organicdatacuration.org/is-geo/index.php/Main_Page

Workshop Information:

