Preview of Award 1560862 - Annual Project Report

Accomplishments

* What are the major goals of the project?

This RCN project has six major goals:
1. Catalyze research planning with strong potential to result in transformative research projects in geography education.
2. Facilitate collaborative research among geographers and STEM education researchers.
3. Attract more diverse cohorts of graduate students to Ph.D. programs in Geography Education.
4. Increase research productivity and the knowledge base in geography education.
5. Secure the long-term growth and stability of the RCN.
6. Promote the use of research to improve practice in geography education.

The primary mechanism for pursuing the goals under this project is a grant program administered by the National Center for Research in Geography Education (NCRGE). This grant program is designed to catalyze the formation of research groups working in different thematic areas of geography education research. Their research planning activities are intended to position them for long-term work connected to the Road Map Project's agenda for transformative research. See appended group reports for details.

* What was accomplished under these goals (you must provide information for at least one of the 4 categories below)?

**Major Activities:**

- **Spatial thinking assessment.** One research group, originating with Geographic Alliances in Maine, New Hampshire, and Colorado, received an NCRGE grant to develop a line of research in the area of assessment, with a specific focus on maps and spatial thinking in elementary school classrooms. Research on spatial thinking is relatively deep, with intriguing connections to learning processes in math and science. Building further on that literature, this group developed a framework for analyzing how students learn fundamental mathematics and spatial analysis skills using giant floor maps of each state. The primary goal of their research planning was to formulate procedures for interacting with teachers, researchers, and Geographic Alliance Coordinators in order to prepare for future research investigating how experience on giant maps impacts students’ understanding of space and mathematical thinking. The transformative potential of this project is evident in the capacity building afforded by developing and testing research instruments and procedures capable of replication in multiple types of classrooms, schools, and districts. Geography faculty, education faculty, mathematics faculty, graduate students, and elementary school teachers all participated in these development and assessment activities.

- **Geography learning progressions.** A second research group, based at Kansas State University and the Kansas Geographic Alliance, received funding to expand the learning progressions research of NCRGE’s GeoProgressions project. The Road Map project identified learning progressions as a significant area of research pioneered in math and science education. One of the key outcomes of GeoProgressions was the publication of a research handbook on learning progressions for maps, geospatial technology, and spatial thinking that was collaboratively developed by geographers and STEM education researchers (Solem, Huynh, and Boehm 2015). The Kansas State-led research group is building upon this prior work by researching learning progressions in the context of national geography standards for teaching and learning about places and regions. Whereas the literature on spatial cognition is relatively deep and interdisciplinary, much less is known about the ways children develop successively more complex and sophisticated knowledge of the geographic concepts of place and region. To evince a path forward, this research group convened a workshop in fall of...
2016 that brought together established learning progressions scholars, geography education and cognitive psychology researchers, early career geography education specialists, and teachers affiliated with the Kansas Geographic Alliance. The workshop addressed the current state of knowledge related to K-12 teaching about places and regions, as a prelude to research that enables the development of learning progressions that capture the complexity and contested nature of places and regions. Following the workshop, the research group will collaboratively write a manuscript based on the workshop proceedings. This publication will be contributed to the existing GeoProgressions research clearinghouse as a resource to support future proposals and activities of this research group. Over time, their research has potential to challenge assumptions about how children comprehend the concept of place and how this influences their understanding of geographic processes related to climate change, migration, national identity, and other relevant topics.

**Geospatially-enabled project-based learning.** The third research group that received funding in 2016 focused its activities in the area of project-based learning (PBL) with geospatial technology. The group is led by researchers at Texas Tech University and Concordia University, with additional collaborators in Panama. They are working to support research recommendations in the Road Map Project by examining field-based learning in a virtual setting and the need for data collection in other natural learning environments, including laboratory settings. Through a series of research meetings, the group designed a pilot study to analyze how authentic project-based learning classrooms can be connected internationally to support geographic and geospatial learning. U.S. secondary school students engaged remotely with Panamanian peers to populate an OpenStreetMap of areas in Panama’s Azuero Peninsula. Through observations of these learning spaces and interactions, the project identified the key mechanisms and assessments of project-based learning environments using geospatial technologies. As one of the most transformative movements in 21st century education, PBL shows broad promise for effective teaching and learning of geography with geospatial technologies. There is a paucity of research that investigates the value of an international component to PBL for transforming geography learning, particularly content linked to national standards and geospatial competencies. By analyzing how students think geographically through international interactions, the project is pioneering work on the notion that there is a scalar dimension to how people learn and think about local-to-global environmental connections and processes.

Specific Objectives: One of the major goals of this RCN project is to nurture the growth of an interdisciplinary and international network of researchers in geography education. See attached RCN member overview for data on the current membership and areas of expertise within the RCN.

Significant Results:

Key outcomes or Other achievements:

* What opportunities for training and professional development has the project provided?

Refer to attached individual reports from the three research groups funded by the 2016 Transformative Research in Geography Education program.

* How have the results been disseminated to communities of interest?
For the 2017 AAG Annual Meeting in Boston, the National Center for Research in Geography Education is welcoming abstracts and organized session proposals for a special track of sessions on *Transformative Research in Geography Education*. This is the first of a planned series of activities at the AAG Annual Meeting to raise the visibility of research in geography education, grow the research network, and provide productive spaces for discussion about geography education research and the notion of what makes research in the field potentially transformative.

Additional dissemination is reported in the attached individual reports from the three research groups funded by the 2016 Transformative Research in Geography Education program.

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*What do you plan to do during the next reporting period to accomplish the goals?*

NCRGE will award a second round of Transformative Research grants in the summer of 2017. The RFP is available at www.ncrge.org/funding with a submission deadline of May 15, 2017.

**Supporting Files**

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<td>2017 NCRGE Transformative Research RFP.pdf</td>
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<td>Michael Solem</td>
<td>04/26/2017</td>
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<td>NCRGE Transformative Research Session Track.pdf</td>
<td>NCRGE Transformative Research sessions at 2017 AAG Annual Meeting</td>
<td>Michael Solem</td>
<td>04/26/2017</td>
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<td>Michael Solem</td>
<td>04/26/2017</td>
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<td>2016 RCN group reports</td>
<td>Michael Solem</td>
<td>05/13/2017</td>
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**Products**

**Books**

**Book Chapters**


**Inventions**

**Journals or Juried Conference Papers**

Michael Solem Richard Boehm (). Transformative Research in Geography Education: The Role of a Research Coordination Network. *The Professional Geographer*. Status = UNDER_REVIEW; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes

Niem Tu Huynh, Patricia Solis, Nwasi Menkiti, and Philippe Huot (). Does International Experience make Students Better
Scientists?. International Journal of STEM Education. Status = SUBMITTED; Acknowledgment of Federal Support = Yes; Peer Reviewed = Yes


Thomas Larsen and John A. Harrington, Jr (. Developing a Learning Progression for Place.. Journal of Geography. Status = ACCEPTED; Acknowledgment of Federal Support = Yes; Peer Reviewed = Yes

Licenses

Other Conference Presentations / Papers

Other Products

Other Publications

Patents

Technologies or Techniques

Thesis/Dissertations

Websites
National Center for Research in Geography Education RCN Social Network http://ncrge-rcn.ning.com/

This site is intended to facilitate communications across the entire research coordination network. All RCN members are invited to:

View and contact the current Members of the RCN, invite someone to join a research project, or suggest a collaboration. Contribute to Forums on Events, Publications, Grants, Graduate Research Opportunities, and Projects. Use the RCN Blog for general discussions about issues of interest to members.

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Participants/Organizations

What individuals have worked on the project?

<table>
<thead>
<tr>
<th>Name</th>
<th>Most Senior Project Role</th>
<th>Nearest Person Month Worked</th>
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<tr>
<td>Solem, Michael</td>
<td>PD/PI</td>
<td>1</td>
</tr>
<tr>
<td>Name</td>
<td>Role</td>
<td>Nearest Person Month Worked</td>
</tr>
<tr>
<td>---------------------</td>
<td>-------------------------------</td>
<td>----------------------------</td>
</tr>
<tr>
<td>Boehm, Richard</td>
<td>Co PD/PI</td>
<td>1</td>
</tr>
<tr>
<td>Zadrozny, Joanna</td>
<td>Graduate Student (research assistant)</td>
<td>1</td>
</tr>
</tbody>
</table>

**Full details of individuals who have worked on the project:**

**Michael N Solem**  
**Email:** msolem@aag.org  
**Most Senior Project Role:** PD/PI  
**Nearest Person Month Worked:** 1  

**Contribution to the Project:** AAG Co-Director of the National Center for Research in Geography Education.  

**Funding Support:** N/A  
**International Collaboration:** No  
**International Travel:** No

**Richard G Boehm**  
**Email:** rb03@txstate.edu  
**Most Senior Project Role:** Co PD/PI  
**Nearest Person Month Worked:** 1  

**Contribution to the Project:** Texas State University Co-Director of the National Center for Research in Geography Education.  

**Funding Support:** N/A  
**International Collaboration:** No  
**International Travel:** No

**Joanna Zadrozny**  
**Email:** J_z37@txstate.edu  
**Most Senior Project Role:** Graduate Student (research assistant)  
**Nearest Person Month Worked:** 1  

**Contribution to the Project:** Provided research assistance to the project directors.  

**Funding Support:** Grosvenor Center for Geographic Education, Texas State University.  
**International Collaboration:** No  
**International Travel:** No

**What other organizations have been involved as partners?**  
Nothing to report.

**What other collaborators or contacts have been involved?**
See attached list of participating collaborators in the three 2016 research groups.

**Impacts**

**What is the impact on the development of the principal discipline(s) of the project?**

Each of the three research groups established in 2016 are pursuing activities that have significant potential to have transformative impacts on geography education, including new theories of geography learning and approaches to curriculum development, teacher education, and assessment practices.

**What is the impact on other disciplines?**

This RCN is forging research collaborations between geographers and STEM educational researchers, thereby opening opportunities for interdisciplinary insights on critical educational research questions and challenges. Refer to appended journal manuscript for additional commentary on the RCN's likely impact on other disciplines.

**What is the impact on the development of human resources?**

RCN projects engage students and practitioners in research training activities. NCRGE will extend the work of the RCN by sponsoring additional research workshops and conferences for early career scholars and graduate students. Refer to appended journal manuscript for additional commentary on the RCN's likely impact on human resources.

**What is the impact on physical resources that form infrastructure?**

Nothing to report.

**What is the impact on institutional resources that form infrastructure?**

Nothing to report.

**What is the impact on information resources that form infrastructure?**

Nothing to report.

**What is the impact on technology transfer?**

Nothing to report.

**What is the impact on society beyond science and technology?**

Nothing to report.

**Changes/Problems**

**Changes in approach and reason for change**

Nothing to report.

**Actual or Anticipated problems or delays and actions or plans to resolve them**

Nothing to report.

**Changes that have a significant impact on expenditures**

Nothing to report.

**Significant changes in use or care of human subjects**

Nothing to report.
Significant changes in use or care of vertebrate animals
Nothing to report.

Significant changes in use or care of biohazards
Nothing to report.
Learning Progressions for Place and Region

NSF Report Information

1. Facilitate collaborative research among geographers and STEM education researchers.

Please send us a list of individuals who are participating in your project: Name, Title, Affiliation, Location, Area of Research Expertise.

<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Affiliation</th>
<th>Location</th>
<th>Area of Expertise</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lisa Millsaps</td>
<td>Assistant Professor of Geography</td>
<td>University of Northern Iowa</td>
<td>Cedar Falls, IA</td>
<td>Geography Education</td>
</tr>
<tr>
<td>Alex Oberle</td>
<td>Assistant Professor of Geography</td>
<td>Northern Iowa University</td>
<td>Cedar Falls, IA</td>
<td>Geography Education</td>
</tr>
<tr>
<td>Brad Burenheide</td>
<td>Associate Professor of Education</td>
<td>Kansas State University</td>
<td>Manhattan, KS</td>
<td>Social Studies Education</td>
</tr>
<tr>
<td>John Harrington Jr</td>
<td>Professor of Geography</td>
<td>Kansas State University</td>
<td>Manhattan, KS</td>
<td>Geography Education, Climatology, Geographic Thought</td>
</tr>
<tr>
<td>Thomas Larsen</td>
<td>PhD Student of Geography</td>
<td>Kansas State University</td>
<td>Manhattan, KS</td>
<td>Geography Education, Human-Environment Relationship</td>
</tr>
<tr>
<td>David Uttal</td>
<td>Professor of Psychology and Education</td>
<td>Northwestern University</td>
<td>Evanston, IL</td>
<td>Psychology, Education</td>
</tr>
<tr>
<td>Sarah Bednarz</td>
<td>Professor Emerita of Geography</td>
<td>Texas A&amp;M University</td>
<td>College Station, TX</td>
<td>Geography Education, Spatial Thinking</td>
</tr>
<tr>
<td>Kristin Gunckel</td>
<td>Professor of Teaching, Learning, and Sociocultural Studies</td>
<td>University of Arizona</td>
<td>Tucson, AZ</td>
<td>Learning Progressions, Science Education</td>
</tr>
<tr>
<td>Phil Gersmehl</td>
<td>Michigan Geographic Alliance, Central Michigan University</td>
<td>Michigan Geographic Alliance, Central Michigan University</td>
<td>Mount Pleasant, MI</td>
<td>Neuroscience, Geography Education</td>
</tr>
<tr>
<td>Tom Herman</td>
<td>Alliance Coordinator of the California Geographic Alliance, Faculty at San Diego State University</td>
<td>San Diego State University, Center for Interdisciplinary Studies of Youth and Space, California Geographic Alliance</td>
<td>San Diego, CA</td>
<td>Children’s Geographies, Geography Education</td>
</tr>
<tr>
<td>Paul Phillips</td>
<td>Professor Emeritus of Geosciences</td>
<td>Fort Hays State University</td>
<td>Hays, KS</td>
<td>Cultural and Historical Geography</td>
</tr>
<tr>
<td>Deborah Hann</td>
<td>Assistant Professor of Geography</td>
<td>Emporia State University</td>
<td>Emporia, KS</td>
<td>Children’s Geographies, Geography Education</td>
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<tr>
<td>Name</td>
<td>Position and Institution</td>
<td>Institution Details</td>
<td>Geographies</td>
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<tr>
<td>David Rutherford</td>
<td>Associate Professor of Public Policy Leadership</td>
<td>University of Mississippi, Oxford, MS</td>
<td>Geography Education, Public Policy</td>
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<tr>
<td>Rhonda Lefferd</td>
<td>K-6 Special Education Teacher</td>
<td>Shawnee Heights Middle School, Tecumseh, KS</td>
<td>K-6 Education</td>
<td></td>
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<tr>
<td>Jinhee Lee</td>
<td>PhD Student of Geography</td>
<td>Texas State University, San Marcos, TX</td>
<td>Spatial Thinking, Geography Education in Korea and U.S.</td>
<td></td>
</tr>
<tr>
<td>Jenny Dauer</td>
<td>Assistant Professor in Science Literacy</td>
<td>University of Nebraska, Lincoln, NE</td>
<td>Learning Progressions, Science Education</td>
<td></td>
</tr>
<tr>
<td>Eleanor Rawling</td>
<td>Research Fellow of Geography</td>
<td>University of Oxford, Oxford, UK</td>
<td>UK Geography Education, GeoHumanities</td>
<td></td>
</tr>
<tr>
<td>Michael Solem</td>
<td>Research Professor and Lecturer of Geography</td>
<td>Texas State University, San Marcos, TX</td>
<td>Geography Education, Transformative Research</td>
<td></td>
</tr>
<tr>
<td>Richard Boehm</td>
<td>Professor and Jesse H. Jones Distinguished Chair in Geographic Education</td>
<td>Texas State University, San Marcos, TX</td>
<td>Geography Education, Economic Geography, Applied Geography</td>
<td></td>
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</table>

2. Attract more diverse cohorts of graduate students to Ph.D. programs in Geography Education.

- Thomas Larsen, graduate student of geography, Kansas State University, Caucasian
- Jinhee Lee, graduate student of geography, Texas State University, Korean

3. Increase research productivity and the knowledge base in geography education.

**Publications**

2017 (Accepted with revisions) Larsen, T., and J.A. Harrington, Jr. Developing a Learning Progression for Place. *Journal of Geography*.

2017 (Forthcoming) Larsen, T., and J.A. Harrington, Jr. Transformative Research in Geographic Education. *Research in Geographic Education*.

**Conference Presentations**


Proposals to Be Submitted


Contributions to NCRGE Research Clearinghouse

Eight members have attained membership on the Learning Progressions (Places & Regions) RCN group webpage.

4. Long-term growth and stability of the RCN.

We have most of the data we need to address this goal. However, we would like to know what external organizations (e.g., professional societies, teacher organizations, etc.) you may have worked with under your project, or plan to work with in the future.

Thus far, our RCN group has begun to work with the National Geographic Network of Alliances for Geographic Education and teachers in the Kansas Geographic Alliance. The group plans to work closely with the state alliance network and interested teachers on future research projects.

5. Promote the use of research to improve practice in geography education.

Provide a brief statement of how you see the longer term implications of your work in terms of broader impacts on geography standards, teacher training programs, curriculum development, assessment development, etc.

RCN research on how students learn place and region has at least three future implications. First, this research will contribute toward a better understanding of how K-12 students develop their knowledge of multi-dimensional, yet foundational, geographic concepts like place and region. That knowledge, in turn, may add to the efforts in learning progressions research in science and mathematics. Second, empirical findings from the RCN will be able to provide a basis for critically evaluating and revising the concepts of place and region in the National Geography Standards. Third, we wish to broaden our understanding of how students learn place and region by diversifying the RCN. We intend to expand the RCN to include more scholars from other disciplines and nationalities. In addition, we hope to engage K-12 teachers within and beyond the social studies and administrators from around the United States to get them using place and region as a format for cross-cutting idea development. Through these objectives, we plan to transform how place and region are taught in K-12 education.
Scaling State Maps research group report

Facilitate collaborative research among geographers and STEM education researchers.

- List of individuals who are participating in the project: Name, Title, Affiliation, Location, Area of Research Expertise.
  - Peter Anthamatten, Associate Professor, Department of Geography and Environmental Studies, University of Colorado Denver, Spatial Thinking
  - Lara Bryant, Associate Professor, Geography Department, Keene State College, NH, Geographic Education
  - Grant Clayton, Assistant Professor, College of Education, University of Colorado Colorado Springs, Curriculum and Instruction
  - Beverly Ferrucci, Professor, Mathematics Department, Keene State College, NH, Math Education
  - Steven Jennings, Associate Professor, Department of Geography and Environmental Studies, University of Colorado Colorado Springs, Geography
  - Cathleen McAnneny, Professor, Department of Geography, University of Maine Farmington, GIS Education
  - Rebecca Theobald, Assistant Research Professor, Department of Geography and Environmental Studies, University of Colorado Colorado Springs, Geography Education

Attract more diverse cohorts of graduate students to Ph.D. programs in Geography Education.

- Tirzha Zabarauskas, female graduate student at UCDenver
- Heather Wittmer, Alexandra White, and Megan Wendolowski, undergraduate female Caucasian students at Keene State College

Increase research productivity and the knowledge base in geography education.

- Publications (all pending)
  - Transformative research article in the RGE
  - Pilot study results will be submitted to the Journal of Geography
  - An article based on the undergraduate seminar study related to teacher attitudes about the giant map will be submitted to a math journal
- Conference presentations
  - “Scaling Giant Traveling State Maps”, New England – St. Lawrence Valley Geographical Society Annual Fall Conference, Quebec, Canada, October 15, 2016
  - “Transformative Research in Geography Education” and “Strategies for Integrating Spatial Skills across Pedagogies and Disciplines” AAG Annual Meeting Boston, MA April 8, 2017

- Proposals submitted, awarded, declined
  - In progress
- Contributions to NCRGE research clearinghouse
  - Research group has been created
  - Giant Map Math Curriculum
  - Sample piloted Assessment
  - Sample data collection forms and surveys
  - Lessons learned from the IRB process and working with schools
  - Pilot Study pending

Long-term growth and stability of the RCN.

- National Network of Geographic Alliances
  - presented a lightning round regarding our curriculum to solicit interest in the next stage of research and data collection.
- State Councils for the Social Studies
  - Maps and curriculum were shared at local conferences
- Association of Teachers of Mathematics in New England

6. Promote the use of research to improve practice in geography education.

The interdisciplinary nature of the research has been very positive. Alliance Coordinators were immediately interested in obtaining information about the math lessons we demonstrated. While coordinating data collection in the schools we have noted that not only are teachers and administrators excited about the opportunity to use the giant map, they are equally excited that they can use it during math time, which is a critical and significant portion of the day. Preliminary teacher surveys indicated that geography teachers were more likely to see and understand connections to math than math teachers were to see and understand connections to geography. The use of this medium and direct connection to math skills will have significant implications in both fields of education in regards to curriculum, materials and teacher training.
**Project Based Learning and Authentic International Experiences for Open Geospatial Education in Secondary Settings**

**ANNUAL REPORT: SOLIS & HUYNH**

**INDIVIDUALS who are participating in our project: Name, Title, Affiliation, Location, Area of Research Expertise, Role:**

**Patricia Solís, PhD**
Co-Director, Center for Geographic Technologies, Texas Tech University, Dallas, Texas
*Areas of expertise:* youth participation, open mapping, Latin America, geospatial technologies;
*Role:* PI, site visits coordinator and proposal development lead; contributor to publications

**Niem Tu Huynh, PhD**
Manager, Graduate Student Recruitment, Concordia University, Montreal, Quebec, Canada
*Areas of expertise:* geospatial thinking assessment, geography education,
*Role:* Co-PI; leader on the assessment framework; contributor to publications

**Lynn Ojeda**
Principal, Plano Independent School District Academy High School, Dallas, Texas
*Areas of expertise:* PBL innovation; teacher professional development; curriculum; pedagogy and assessment
*Role:* keynote speaker in Panama event; contributor to proposals and publications; NCRGE RCN Fellow

**Daniel Carpenter, Ph.D**
Director of STEM Education and Co-director of the Ph.D. in STEM Education and Assistant Professor, Texas Tech, Lubbock, Texas
*Areas of expertise:* specializes in science education, place based learning models, and assessment of learning in place based science projects.
*Role:* NCRGE RCN Fellow

**Manuel Quintero**
Consultant; Former Geospatial Advisor in the Panamanian national institution, Authority for Governmental Innovation; Panama City, Panama
*Areas of expertise:* supports the research team connect end-use cases and data needs of decision makers in the international pilot site Panama
*Role:* training of Panamanian students in geospatial tools for project; youth-based volunteer mapping and hacking initiatives; NCRGE RCN Fellow
Other collaborators on closely related proposals/publications/events:

**M. Duane Nellis, Ph.D**
Past President of Texas Tech University, Outgoing Professor, Honors College and Department of Geosciences, Incoming President of Ohio University; Athens, Ohio
*Areas of expertise:* specializes in integrative sciences, physical geography, geo-spatial technologies, and leadership, education, diversity, remote sensing

**Guofeng Cao, Ph.D**
Co-Director, GIS Center, Assistant Professor at Texas Tech, Lubbock, Texas
*Areas of expertise:* specializes in geo-spatial technologies, including geographic information systems (GIS) and interfaces with social networks; place-based cyber learning environment design

**May Yuan, PhD**
Ashbel Smith Professor of Geospatial Information Sciences in the School of Economic, Political, and Policy Sciences at the University of Texas at Dallas, Dallas, Texas
*Areas of expertise:* geospatial technologies, temporal GIS; GIScience; women’s participation in geography and GIScience

**Maria Adames de Newbill, PhD**
Professor of Geography, University of Panama, Panama City, Panama
*Areas of expertise:* geography, geographic education; study abroad; ecotourism; student mapping; YouthMappers chapter advisor in Panama

**STUDENTS**

**Nwasi Menkitti,** Doctoral Graduate Student in Interdisciplinary Studies, College of Landscape Architecture, Texas Tech University
Gender/Ethnicity: Female, African

**Julia Kleine,** Undergraduate Student in Geosciences, College of Arts & Sciences, Texas Tech University and President of TTU YouthMappers chapter
Gender/Ethnicity: Female, Caucasian

**Halle Miller,** High School student, International Baccalaureate Program, Plano East High School
Gender/Ethnicity: Female, Black

**PUBLICATIONS**

In submission


In preparation

CONFERENCES & WORKSHOPS

SOLIS & HUYNH:

2017 “Transformative Research in Geography Education.” Panelists; National Center for Research in Geography Education Symposium, April 9, Boston, Massachusetts.

2017 Best Practices in Project Based Learning and Authentic Experiences for Open Geospatial Education in Secondary Settings, Workshop Organizers and Facilitators, AAG Annual Meeting, April 8, Boston, Massachusetts.

SOLIS:

2017 “Creando jóvenes mapeadores, no sólo mapas,” Keynote Speaker, Conference Theme on Geography Education, Encuentro de la Geografía en America Latina, April 27, La Paz, Bolivia.

2017 “Building mappers not just maps: challenges and opportunities from YouthMappers on scaling up the crowd in crowd-sourced open mapping for development.” Paper presenter. AAG Mapathon; AAG Annual Meeting, April 7, Boston, Massachusetts.

2016  “El Reto y la Oportunidad del Mapeo Abierto.” Invited Speaker, Directing Council Meeting of the PanAmerican Institute for Geography and History of the OAS, November, Asunción, Paraguay.

2016  “We don’t just build maps. We build mappers.” Keynote Speaker, GeoWeek and International Education Week, Monroe Community College, November, Rochester, NY.


2016  Mapping to fight Malaria in Kenya, Workshop Instructor, training and career awareness session for ~120 secondary students, September 30, Academy High School, Plano, Texas.

2016  “Aprendizaje basado en Proyectos,” Invited Speaker, Ministry of Education (MEDUCA), Panama; August, City of Knowledge, Clayton, Panama.

SOLIS: Teaching with PBL & GIS as a Service Learning Faculty Fellow (sponsored by the TTU Teaching, Learning and Professional Development Center)

- Spring 2017 Special Topics in Geography: Open Mapping for Resilience, GEOG4320/5130-S, undergraduate and graduate hybrid online course with Service-Learning designation, Spring Semester, 15 students and wiki-coauthors for projects in Uganda, Colombia, Nigeria, Philippines, with USAID GeoCenter, Missing Maps, Red Cross, USAID Office of Foreign Disaster Assistance, presented via StoryMap, Department of Geosciences, Texas Tech University
- Fall 2016 Special Topics in Geography: Open Mapping for Resilience, GEOG4320/5130-S, undergraduate and graduate hybrid online course with Service-Learning designation, Fall Semester, 18 students and wiki-coauthors for projects with USAID GeoCenter in Kenya, Colombia, Ghana, Indonesia, presented via StoryMap, Department of Geosciences, Texas Tech University

PROPOSALS

NSF EAR, GP-IMPACT: Bringing Innovation into the Equation through a Place-Based Pathway, DECLINED (10/10/2016); $408,852

NSF IIS EXP: GeoPlaceBased-Cyberlearning Communities for Cross-Boundary (G-C3) Learning Advances, PENDING (02/10/2017); $549,971
TTU Internal Quality Enhancement Plan, Center for Global Communication, “Story Maps of Humanitarian Projects around the World.” PENDING (04/12/2017); $80,000

CONTRIBUTIONS to NCRGE research clearinghouse
- 17 members thus far in the PBL Research Group
- Forum is active and has ~30 images
- Annotated Bibliography of over two dozen highly relevant articles/books/resources related to PBL

STATEMENT
Long-term implications of your work in terms of broader impacts on geography standards, teacher training programs, curriculum development, assessment development, etc.:

By explicitly linking project-based-learning to national standards, intercultural and geospatial competencies, we hope to build a body of work that can shape, justify, and provide a foundational capacity for research in PBL-GIS that is supportive of geography learning. We also believe the international component adds much value to this RCN. The authenticity of the experiences connected to real-world situations, especially international experiences, is expected to provide a tested model transcending current frameworks. We also see that the complexity of assessing learning outcomes relative to national standards and competency based rubrics for real-world PBL, particularly assessments which are gender-sensitive are in short supply and much needed in the current STEM/STEAM pathway research.
When we started the RCN (prior to NSF funding) we had 30 national locations and 10 international. Since then we have added 27 national and 7 international locations.

36 of the total 74 RCN locations are accounted for on the social media site.

Of the 71 individual members that have joined the RCN social media network, these are their research interests and areas of expertise. 21 of the members are international and 50 are national.