External Evaluation Report
National Geospatial Technology Center (NGTC)

YEAR 1
September 1, 2009 through February 13, 2009

SCATE Inc., lead by Elaine L. Craft, President/CEO, serves as the external evaluator of the Center. Craft also has years of experience as an ATE National Center Director, and she has provided pre- and post-award mentoring to the Principal Investigator (PI), primarily to assist with setting up the National Advisory Committee and numerous systems for managing the NGTC. The PI has been open and honest with sharing information. Extensive opportunities to observe the project team in action have been provided.

The National Geospatial Technology Center (NGTC) is working quickly to form a collaboration of community and technical colleges, universities, and industry, to increase the quality, quantity, and diversity of workforce technicians in the geospatial technology industry. All NGTC partner institutions seek to engage under-represented minorities and women in geospatial technology programs. Co-PI Kenneth Yanow has specifically been assigned to coordinate the diversity effort and has worked in Year 1 to collect successful practices from across the partnership as a first step in this effort.

The evaluation plan for the project follows:
Goals and Outcomes of NGTC.

The Center is seeking to
- Create a national clearinghouse of exemplary geospatial curriculum material and database web services.
- Increase the capacity to train geospatial technicians through new partnerships among colleges, universities, government, and industry.
- Increase the quantity, quality, and diversity of geospatial technicians to meet workforce needs.
- Increase the number of educators participating in geospatial professional development.
- Sustain the Center long-term by providing valued services to academic and industry partners and seeking collaborations and sources of funding to maintain and improve services and products.
If the Center meets its intended goals, the following outcomes should be attained.

- Models of exemplary geospatial programs in terms of technology, curriculum, articulation, and workforce education will be identified and broadly shared.
- The next generation of geospatial science students will include an increased number of under-represented minorities and women.
- The body of knowledge available to students, educators, researchers, and employers in the geospatial technology industry will be expanded.
- The capacity of two-year colleges to educate geospatial technicians will be increased.
- The quantity, quality, and diversity of geospatial technicians enrolling in and completing programs of study increased.
- Potential services, collaborations, and funding sources to sustain the work of the Center have emerged.

Evidence of Impact
National Geospatial Technology Center (NGTC)

Goal 1: Create a national clearinghouse of exemplary geospatial curriculum material and resources website and a national geodatabase web service, aligned with nationally recognized core competencies as identified in University Consortium GIScience (UCGIS) Model Curriculum Body of Knowledge (BoK).

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<tr>
<th>Evaluation Questions</th>
<th>Data collected</th>
<th>Methodologies</th>
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<tr>
<td>Was a national clearinghouse of geospatial curriculum material established?</td>
<td>-number of lessons, teaching/learning units, courses, etc. -number of other teaching/learning resources -number of geodatabase links and resources -website usage statistics -number of regional and national presentations made to promote the widespread use of the clearinghouse. -number of products listed in the clearinghouse database. -evidence of use of the clearinghouse by geospatial educators. -review criteria and process documents -NVC reports</td>
<td>-monitor and document the development of the clearinghouse. -review and analyze website statistics -review and document quality control processes -review and document the quantity of materials available on the website -monitor web-based evaluations by clearinghouse users. -regular emails and conference calls with institutional partners -review of NVC reports regarding effectiveness -comparison of evidence to project goals/metrics</td>
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<td>How many items have been added to the clearinghouse?</td>
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<td>How effective was the clearinghouse in disseminating information?</td>
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<td>Were effective methods developed for ascertaining the quality and usability of learning material submitted to the clearinghouse website?</td>
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How were nationally recognized geospatial core competencies determined? Were geodatabase and other web-based services developed by the Center useful to secondary schools and colleges?

- core competency determination process and reference source documents
- frequency of high school use of clearinghouse and web-based services
- frequency of college use of clearinghouse and web-based services

- monitor alignment of core competencies with documented state and/or national standards
- analyze website usage statistics
- on-site visits to attend planning and implementation sessions.
- partner surveys and/or focus groups

Goal 2: Increase the capacity to train geospatial technicians through new partnerships among community and technical colleges, universities, secondary schools, industry and government.

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| Are there more qualified geospatial technology teachers at educational institutions? Have more educational institutions introduced or expanded geospatial education courses or programs? Were partnerships among colleges, universities, government, and industry increased? By how many? Did articulation of credit increase between high school and college and between college and university? | -numbers of faculty trained through Center-offered or Center-supported faculty development events.
- number of faculty attaining GST credentials, e.g., certification.
- number of programs of collaboration between institutions and industry.
- number of articulation activities/agreements between secondary schools and colleges, and between colleges and universities.
- number of geospatial programs that currently exist in partner institutions.
- titles of geospatial-related courses and programs offered at partner institutions during 2007-2008 academic year.
- number of GST courses, programs, or programs adding a GST requirement at partner institutions. | -analyze project documentation related to faculty development
- document baseline number and type of courses and then of programs being added or expanded over the course of the project
- survey Co-PIs concerning programs at their institutions.
- monitor the growth of geospatial programs at partner institutions
- analyze evidence of articulation at all levels.
- regular conference calls with partner institutions.
- three on-site visits annually by evaluators to attend PI meetings, NVC and other advisory committee meetings, and to observe classes, interview instructors, students, and industry partners.
- comparison of evidence to project goals/metrics. |
| What mentoring links exist between secondary school teachers and college faculty? Between college faculty and industry representatives? | Documented mentoring activities:  
- One-on-one meetings between teachers  
- Number of contacts with high school teachers about GST education  
- Number industry contacts  
- Number of visits to industry  
- Number of industry visits to college | -analyze project documentation related to mentoring activities  
- survey and/or interview Co-PIs concerning partnerships and collaborative activities. |
|---|---|---|
| What geospatial industries are available and willing to collaborate with secondary schools and colleges? | -number of existing industry partners  
- number of new industry partners and partnership programs/activities  
- partner survey results  
- documented partner contributions to GST programs:  
  - Dollars  
  - Professional time  
  - Equipment and/or software  
  - Other | -establish baseline of industry partnership across partner institutions  
- review project documentation regarding the number of new partnerships and partnership programs/activities  
- evaluate impact of new industry partnership by surveying secondary school administrators, college faculty, industry representatives.  
- analyze growth in industry support over time. |
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<th>Goal 3: Increase the quantity, quality and diversity of geospatial technicians to meet workforce needs.</th>
<th>Evaluation Questions</th>
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| Were effective recruitment models for attracting students to geospatial technology programs developed and utilized? | - recruitment resource materials  
- communications between secondary schools and colleges  
- institutional enrollment data provided by partner institutions, including demographics | - monitor web site and published materials  
- regular conference calls with partner institutions.  
- analyze enrollment data and trends  
- comparison of evidence to project goals/metrics. |
| How was the website used to increase national awareness of employment opportunities for graduates? | -website usage statistics by page  
-website usage statistics by page  
-project documentation of career opportunities and its presentation on the web | -analysis of on-line surveys  
-analysis of institutional student data that include demographics of students, graduation data, placement data, transfer data, and term-to-term student retention.  
-comparison of evidence to project goals/metrics |
|---|---|---|
| What is the baseline of current college and secondary enrollments at partner institutions?  
What student populations are under-represented at partner institutions?  
Are women and other minorities successfully recruited to the geospatial programs, by partner location and overall?  
How are students tracked to determine retention?  
Are students completing programs and being employed as geospatial technicians?  
Are transfer options available and being pursued by students? | --institutional enrollment, demographics, and graduation data provided by partner institutions  
-survey data  
-Program enrollments  
-Course enrollments  
-Graduates  
-Placement in GST jobs or transfer  
-Employer feedback on graduates | |

Goal 4: Increase the number of community and technical college geospatial faculty and secondary school teachers participating in geospatial professional development.

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| What geospatial professional development opportunities exist for secondary and college instructors?  
Do teachers implement or enhance GST instruction as a result of participation? | -data regarding number of professional development events available in geospatial technology from www.TeacherTechnicians.org  
-attendance reports and rosters for Center-provided or Center-supported faculty development events  
-number of course or program completers | -monitor and analyze faculty development offerings announced at www.TeachingTechnicians.org  
-analyze baseline completer information for Center-offered or Center-sponsored events  
-analysis of high school and college instructor participation in faculty development in geospatial technology and subsequent implementation activity. |
### Evaluation Questions

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<td><strong>Goal 5: Sustain the Center long-term by providing valued services to academic and industry partners and continually seeking collaborations and sources of funding to maintain and improve services and products.</strong></td>
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<td>What new collaborations hold potential for future funding of the Center?</td>
<td>-donations to Center</td>
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<td>-requests to Center for materials</td>
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<td>-requests to Center for consulting or technical assistance</td>
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<td>-number of collaborations that resulted in follow-up work or interaction/sharing</td>
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<td>-requests to Center to partner in grant proposals or other initiatives involving financial support of the Center or Center personnel</td>
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<td>-number of grant proposals sought/received by partner institutions to expand or support geospatial programs</td>
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<td>-NVC reports</td>
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<td>-analysis of project data on requests and results of those requests</td>
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<td>-analysis of project data on donations or in-kind contributions of the type that could sustain the Center over time</td>
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<td>-industry/institution surveys to determine demand for fee-based services of the Center.</td>
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<td>-review of NVC recommendations regarding sustainability</td>
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<td></td>
<td>-project data regarding initiatives by partners designed to provide funding to support or expand geospatial programs</td>
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<td>-comparison of evidence to project goals/metrics.</td>
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<td>What fee-based services are offered? How are fee-based services determined, evaluated, and advertised?</td>
<td>-requests for specific fee-based services</td>
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<td>-feedback from institutions/industries regarding quality and usefulness of fee-based services.</td>
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<td>-analyze project data regarding fee based services and demand</td>
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<td>-attend PI and NVC meetings</td>
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<td></td>
<td>-review of NVC recommendations regarding sustainability</td>
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<td>-communicate through regular conference calls and emails.</td>
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Initial steps in the evaluation process have included working with the project team to develop data collection systems that will be helpful to each partner site while facilitating aggregate data reporting for the entire project. Care is being taken to collect data in ways that protect student privacy. Data elements are also designed to assist the PI with completing the annual ATE Program Survey. The goal is to use a secure, on-line data base system into which each partner will enter data. Until this system can be created (a secondary activity to getting the NGTC website/clearing house operational), an Excel spreadsheet template has been created to capture baseline data. Baseline data for the project will consist of Year 1 data captured from fall 2008 and spring 2009. Subsequent years will capture summer-fall-spring data for the grant year. All partners have been provided with data elements to capture, and some data has been received. Where missing data is discovered, partner sites are being prompted to provide the required data. In spite of carefully crafted partnership agreements and subaward stipulations that require providing data, partners have encountered some difficulty in supplying the data that has been determined essential to the project. Challenges range from time delays due to other institutional research priorities to administrative resistance to sharing data. The PI and his staff are working to resolve all issues and provide requested data. As of mid-February, no site has supplied all of the requested data for fall 2008.

The project team is benefitting from well established relationships that existed prior to the formation of NGTC. They truly “hit the ground running.” The work done in some cases is definitely moving the project towards its objectives. In some areas, however, the work has been focused too locally without a clear, strategic alignment to the goals of the Center. This seems to be particularly true for outreach and faculty development activities where many activities were already planned and, in some cases, are the work of other related projects. The National Advisory Committee and Evaluator have encouraged the team to resist taking on too many different activities and new initiatives so early in the life of NGTC; to be purposeful about all grant activities, aligning each with a “desired outcome” that supports one or more project objectives; and, to strategically work on a limited number of potentially high impact activities each year vs. trying to work on everything every year. Since several partner sites have related projects that are being conducted parallel to and synergistically with the work of NGTC, the team has been encouraged to differentiate the funding source for activities to help ensure accountability. The evaluator has provided a sample tracking template to the PI and encouraged the PI to work with partners to help ensure that all faculty development and outreach activities sponsored/funded by NFTC are evaluated as they occur and that plans are made for follow-up evaluation where appropriate. These activities are essential to evaluating the impact of the intervention.

The National Advisory Committee was very helpful in identifying what needs to be done first for the success of the Center so that the PI and project team can align priorities and activities accordingly. The project team meets regularly and uses technology very effectively to engage and inform all partners as well as to keep the evaluator apprised of project activities. The PI has strong communication skills and has established work practices that keep partners constantly engaged. Team member input is valued, and everyone knows what the issues are, what each
person is doing, and what is planned. This work practice bodes well for the Center going forward. The way in which the PI and project team took immediate action in response to the comments and recommendations of the National Advisory Committee is commendable and should result in improved outcomes for the Center.

The office that has been established for NGTC at Del Mar College is exceptional. It is accessible, attractive, spacious, and reflects a high level of professionalism and institutional commitment to hosting the ATE Center. This nice work space will make it easier for the project staff to provide the support needed by partners and the greater geospatial technology community that the Center aspires to serve. Dissemination activities are well underway although services and resources of the Center are limited at this time. Planned activities will start the important process of building the brand identity of NGTC as the central voice for technician education in the field of geospatial technology.

Progress on activities as reported by the PI and the project team have been verified and will not be repeated in this report. David DiBiase’s involvement appears pivotal to quickly achieving national recognition of the core competencies for, and role of, geospatial technicians in the workforce. His credibility in the discipline and enthusiasm for the work of NGTC are very positive attributes of the Center. Based on National Advisory Committee recommendations, his role in the project is being increased.

The work on the website and web-based clearing house has not progressed as desired and a change in contractor is anticipated. It is critical to get this piece right for many other aspects of the project to move forward.

An exciting contribution to the discipline may result from the technology research being explored for NGTC by Co-PI Vince Dinoto. If successful, one of the biggest barriers to expanding geospatial technology instruction in high schools and community colleges may be overcome by simplifying the process of installing and maintaining complex GIS software applications like ESRI ArcGIS on end-user desktop computers. The cost of and technical support required for this software is a well documented barrier to teaching geospatial technology.

Unlike many technologies in the ATE program, geospatial technology provides tools that can be employed within to display and promote the value of the Center. An early example is the map that one Co-PI has created to depict the location of all community colleges in the United States. Upon this background, various data can be displayed such as the location of existing geospatial technology programs. This work breaks new ground and will be very helpful not only to this Center but to the ATE program overall. The NGTC is already assisting the new EvaluATE Center at Western Michigan University to depict information from their work by geographic location. Having valuable services that evolve from applications of the technology may lead to successful sustainability strategies.
Recommendations

- Continue with ongoing responses to comments and recommendations from the National Advisory Committee
- Work with Co-PIs/partners to get complete sets of baseline data from each location.
- Consider how data collection will be achieved for new partners in the future (what are the “lessons learned” to date, and how can this experience help the project with new partners?)
- Be diligent in evaluating activities. Do not plan or conduct activities without collaborating with the evaluator so that evaluation tools can be developed and administered that are appropriate to the activity.
- Be systematic about documentation and employ on-line tools for partner reporting to the degree possible.
- Be purposeful and strategic in all actions, determining the desired outcome and the relationship of the activity and desired outcome to project goals/objectives.

Conclusion
The NGTC is off to an exuberant and solid start. The enthusiasm of all involved is evident. The focus on a central effort, however, appears to have been clearer during proposal development than in the first few months of operation. This is likely the result of the PI trying to do too much too soon coupled with hard-working Co-PIs who know how to get things done locally and immediately got to work in their home environment. With the re-focusing guidance of the National Advisory Committee and evaluator, the project is quickly realigning for national impact. No doubt the coming year will begin to produce solid evidence of progress towards NGTC goals.