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Project Title: Multi-State Planning and Implementation of Geodetic Control Framework Components

Final Report

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Executive Summary

In summary, the Multi-state planning and implementation of Geodetic Control Framework Components project was a successful one. The improvements to the multi-state control point database (MCPD) and web interface were successfully completed by GCS Research and the project team. In addition, the business plan for a Geopositioning Cooperative (GeoCoop) was developed by Croswell-Schulte and the project team. The latter was the most successful accomplishment with much enthusiasm garnered in the region as a result of this plan. We are moving forward immediately toward implementation of this plan and would appreciate help from USGS FGDC in identifying funding sources for initial startup.

As expected, clear and frequent communication among the project team was key to our successes as was a series of stakeholder outreach activities including a web-survey, in-person meeting, and follow-up teleconference. As a direct result of these efforts much progress has been made toward building a solid working relationship with the precision agriculture community as potential end-users of the GeoCoop.

Project Narrative

Summary of project activities

This joint Idaho and Montana project employs a two-part approach to describe a well-conceived approach to support geodetic, surveying and mapping control across a multi-

state environment. The technical portion provided tools to support the discovery, use, and exchange of geospatial control information in two states by adapting the Montana Control Point Database to similarly integrate data from Idaho. The result is the new Multi-state Control Point Database and web application (MCPD; http://gisservice.mt.gov/MCPDviewer/ or http://geo.gcs-holdings.net/itsd/mscpd [a mirror server]).

The second and interrelated portion of the project developed a business plan for a Regional Geodetic Reference Center which will support both Idaho and Montana. The aptly named Geopositioning Cooperative (GC) will support various projects and programs such as hosting the MCPD, working toward densifying the Continuously Operating Reference Stations (CORS) network in Idaho and Montana, and establishing a real-time GNSS network in these states. The business plan addresses benefits, governance, management, funding, technical issues, and identifies a phase development approach that will help insure accountability, longevity and stability of the GC.

Key accomplishments
The project completed all tasks and deliverables on or before the end-date. GCS Research in Missoula Montana completed many of the technical aspects related to the MCPD web application. Croswell-Schulte and Associates completed numerous drafts of the business plan. In both cases, interaction between contract services, the PI, and the project team were extensive with weekly communications and action items the norm. A total of 14 formal technical/project meetings were held over the year with enumerable additional e-mail communications and telephone conversations, including an important stakeholders meeting on June 21st and an additional special precision agriculture stakeholders meeting on August 10th.

The latter stakeholder meetings were a follow-up from an on-line survey which was conducted using Survey Monkey software. That survey had over 100 respondents and the follow up meeting allowed us to forge a vital contact with precision agriculture stakeholders. Notes from the stakeholders meetings were submitted as part of the interim report.

Inclusiveness of efforts
Our efforts have been as inclusive as possible. As anticipated, we have had good involvement from the GIS, GPS, and surveying community. In addition, the machine control (construction industry), local government engineers, and precision agriculture communities have been quite involved across both states. To include these new stakeholder groups we held a stakeholders meeting with both in-person and web-conferencing venues, and a second special follow-up teleconference with the precision agriculture community as a direct result of their expressed interest at the initial stakeholders meeting.

We have leveraged a number of community contacts and technologies to aid in our success. One is a presentation at the 2011 Intermountain GIS Users' Conference to let the GIS community in Idaho and Montana know about the project while others were articles which

appeared in the Gem State Surveyor and Treasure State Surveyor magazines (publications of the Idaho and Montana state surveyors associations, respectively).

In addition, project team members will be presenting results of this study at the Idaho public land surveyors' annual conference in Twin Falls, Idaho on March 29th and at the 2012 Intermountain GIS Users' Conference in Kalispell, Montana on April 18th.

Statewide and Multi-state coordination
Within Idaho, it seems both the business plan and development of a multi-state control point database are being well accepted by most segments of the user base. Indeed, several agencies and surveyors are eager to add their data to the database. The multi-state endeavor has been more difficult however as momentum and interest from some in Montana has waned over the duration of the project. It is difficult to know if multi-state coordination will be truly enhanced by this effort though it has all potential to be very beneficial for future coordination and collaboration. Within each state I feel certain this project will be viewed as a success.

Success factors
It became quite clear throughout this project that the dedication of the project team would be an important factor in its success. Frequent communication with team members and the consultants was critical. In total 14 meetings were held over the past year with innumerable e-mail and telephone conversations. Have said this, the exact opposite was also found to be true, if a given team member was not dedicated to the project they tended to disconnect and fail to attend meetings. As a result, the remaining team members were compelled to do even more for the project, hence the need for a large team with several truly dedicated to the project's success.

In addition to the project team, Croswell-Schulte and Associates were extremely helpful and beneficial to this project. Peter Croswell acted with sincere dedication throughout this project and without his efforts and skills the project would not have been as successful as it was.

NSDI advances
As described in the attached business plan, there are many states with existing GNSS real-time networks and control point databases. Both Idaho and Montana are exceptions to this general rule but with the completion of this project are making strides towards remedying this. For example, we realized well over a year ago that the development of a statewide RTN was not feasible without a viable plan for long-term sustainability. The CAP project provided the perfect opportunity to satisfy this important prerequisite. As a result of these efforts the national spatial data infrastructure has been advanced incrementally with the potential for a significant advance once the RTN is funded and deployed.

Next Steps
Currently, the final stage of MCPD website transition is being completed with the updated MCPD website expected to be fully operational on or before February 24th, 2012. The next steps in this project are to implement the carefully designed business plan. Toward that

end, we are seeking approval by both the Geodetic control technical working group (TWG) and Cadastral TWG at their regular March meetings. After this, the business plan will move to the Idaho Geospatial Council-executive committee for recognition and acceptance at their April meeting. In addition, we have begun working with ISU's purchasing department to prepare for the purchase of RTN server software and have begun working closely with various end-user organizations to enter into partnership with them to fund the purchase of the RTN software. Other avenues to acquire the necessary funding are currently being explored. In addition to these steps, ISU's GIS TReC recently invested in a substantial upgrade to the server which will be used for the RTN.

Assuming start-up funding is obtained, we will follow the business plan to maintain the RTN and MCPD into the future using subscription/membership fees as well as other opportunities to fund and sustain this project into the future. Given the unpredictable nature of funding availability long-term sustainability can never be guaranteed.

To assist both Idaho and Montana in realizing the full implementation goals of this project it would be very helpful if a source of potential funding could be identified. In addition, a letter of support for this project from the USGS FGDC would be most appreciated.

Attachments
Attached to this final report is the completed business plan (also available at http://giscenter.isu.edu/research/Techpg/capGC/pdf/GeoCoopBP-FINAL.pdf). Within that business plan is the URL to the upgraded MCPD website (http://gisservice.mt.gov/MCPDviewer/ and http://geo.gcs-holdings.net/itsd/mscpd [mirror site]).

Feedback on Cooperative Agreements Program
What are the CAP Program strengths and weaknesses?
The CAP program is a great program and without it I suspect a large number of meritorious and much needed projects would simply never occur. Its concept is perfect and I cannot speak to any weaknesses.

Where does it make a difference?
As eluded to above, the CAP program provides a unique niche for funding. Without the ability (time and resources) to create a well-documented plan many projects related to the NSDI would never come to fruition.

Was the assistance you received sufficient or effective?
Yes, the assistance received from USGS FGDC was effective. I especially liked the mid-term project meeting that was accomplished via teleconference.

What would you recommend that the FGDC do differently?
I especially liked the mid-term project meeting that was accomplished via teleconference and hope FGDC will be able to leverage this type of meeting more in the future. I also appreciated getting to know other PI's through the teleconference and being made aware of their projects. Several were very appropriate to issues faced in Idaho.

Are there factors that are missing or additional needs that should be considered?
I cannot identify any missing elements from this program.

Are there program management concerns that need to be addressed, such as the time frame?
No, I do feel there are program management concerns. Running this program on a yearly cycle is important, requiring firm deadlines, reviews, and award dissemination.

If you were to do this again, what would you do differently?
I would be hesitant to conduct another multi-state project. That is not to say that all collaborative efforts across state lines will have problems as I have been involved with several research studies that were quite successful with investigators in various locations, including international collaborations. I believe if a multi-state investigator team has an established track record of successful collaboration together then the project will be successful. Having said this, I do not want to misconstrue the results of this project to suggest they were not successful. On the contrary, this was project was fully successful but required additional efforts by the PI and dedicated team members to make it so.