

## 2011 CAP Category 4

### Proposal Narrative

#### 0. Proposal Summary

- a) Project Title  
2011 CAP Category 4: Multi-State Planning and Implementation of Geodetic Control Framework Components
- b) Applicant Organization – Idaho State University, GIS Training and Research Center
- c) Collaborating Organizations
  1. Montana Department of Administration (DOA), Base Map Service Center, will contribute existing control point database and online application for adaptation and provide significant input and perform or arrange for selected project tasks.
  2. Idaho Department of Administration (DOA), Idaho Geospatial Office, will assure alignment with strategic and business plans and edit documents
  3. National Geodetic Survey (NGS) will assure alignment with NGS strategic and business planning goals and provide guidance and expertise by making its advisor for both states available (federal partner).
  4. Montana Geodetic Control Workgroup will contribute advice, Montana customization information and help carry out project tasks.
  5. Idaho Cadastral Reference Workgroup and Idaho Geodetic Control Technical Workgroup will contribute Idaho customization information and help carry out project tasks. These workgroups are bodies recognized by the Idaho Geospatial Council (IGC).
  6. Bureau of Land Management (BLM), Montana State Office, will assure results are useful for GCDB enhancement and accessible to agency needs and provide Federal survey expertise as requested.
  7. Bureau of Land Management (BLM), Idaho State Office, will assure results are useful for GCDB enhancement and accessible to agency needs and provide Federal survey expertise as requested.
  8. Idaho Society of Professional Land Surveyors (ISPLS) will advise on Idaho data model customization.
- d) Organization Internet – <http://giscenter.isu.edu>
- e) Principal Investigator  
Name – Keith Weber  
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- f) Other key contact personnel

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- g) Previous NSDI Cooperative Agreement Participation  
The applicant was awarded a CAP grant in 2010 (G10AC00170), Business Plan Development for Regional Resource Centers in Idaho.

h) Short Description of Project

This joint proposal by Montana and Idaho employs a two-part approach to demonstrate technical and governance approaches to support Geodetic Control in a multi-state environment. The technical part will provide tools to support the discovery, use, and exchange of geodetic information in two states by adapting the Montana Control Point Database and application to consume and make available Idaho's control points. The result will be a Multi-state Control Point Database and application (MCPD). This project requests \$39,336 with a 51% match (\$19,885) and is planned to begin 1-March-2011 through 28-February-2012.

To achieve long-term success, the second part addresses collaborative development of a business plan to:

- a) Establish and operate a Regional Geodetic Reference Center to sustain the MCPD and
- b) Realize a real-time network of Continuously Operating Reference Stations (CORS) in both states and possibly others.

The plan will address governance, management, funding, technical issues, and other aspects that insure accountability, longevity and stability. The results will demonstrate a viable path to a Geodetic Control Framework for the region and, potentially, the nation.

## 1. Project Scope

*a) Describe the existing status of strategic and business planning activities.*

Idaho's strategic and business plans for a spatial data infrastructure were developed through a 2008 Fifty States CAP grant. The plans are actively used to guide and prioritize SDI activities. Also, Idaho is completing a business plan project for regional resource centers, an organizational component of its strategic plan.

The Montana Geospatial Strategic Plan was compiled with a 2005 FGDC CAP grant. The five-year plan expires December 31, 2010. However the Montana Land Information Advisory Council is considering extension since much of the plan is still valid. Montana business planning is embodied in its annual Land Information Plans required by the Montana Land Information Act. The annual plans prioritize SDI activities and drive spatial data policy.

Both states have active collaborative Framework teams working on geodetic control and cadastral themes of the National Spatial Data Infrastructure (NSDI), and both themes are part of the strategic vision for each state's SDI strategic and business plans.

*b) Describe the proposed business plan development and implementation.*

Geodetic control supports all National Spatial Data Infrastructure Framework. This was recognized by the Federal Geographic Data Committee in its *FRAMEWORK Introduction and Guide* (1997, ch. 3):

Geodetic control provides a common reference system for establishing the coordinate positions of all geographic data. It provides the means for tying all geographic features to common, nationally used horizontal and vertical coordinate systems. ... Geodetic control information plays a crucial role in developing all framework data and users' applications data, because it provides the spatial reference source to register all other spatial data.

Both Idaho and Montana realize the key to a successful spatial data infrastructure is sound geodetic control that is accessible and continuously improving and not reliant on any single organization for its perpetuation.

This proposal has two parts: 1) extend Montana's existing control point database and application to incorporate two states' data; and 2) develop a business plan to establish a Regional Geodetic Reference Center to manage and sustain the Multi-state Control Point Database and application (MCPD), as well as to establish, manage and sustain a real-time network to improve and streamline surveying and mapping activities.

The Montana Geodetic Control Working Group has developed a geodetic control point database and data discovery and retrieval application published at <http://gisservice.mt.gov/MCPDviewer>. This capability includes geodetic control that is not part of the National Geodetic Survey's database by standardizing and integrating private- and public-sector data into a single database. This augmented geodetic control supports the survey and mapping communities in a variety of geospatial needs.

Idaho needs a database and application for similar reasons and has canvassed solutions, Montana's among them. After a year of research, Idaho concluded that Montana's application could be adapted but key resources such as personnel and money were necessary and neither were forthcoming. Instead, the concept of a joint Montana-Idaho database and application was broached as a potentially more feasible alternative that would build on existing resources and enhance state-level collaboration to overcome the existing barriers. This approach would also simplify the client experience for data discovery and data sharing. Moreover, it would help realize seamless Hydrography, Elevation, and Imagery Framework across state boundaries.

We propose to extend Montana's existing capability to include Idaho's data to form the MCPD. To achieve this goal, we will develop a standard data submittal format and interchange formats for data export. The existing tools for discovery, use, and exchange of geodetic information will be modified, as well. Proof-of-concept will be demonstrated by the ability to load data into a multi-state database, display and query multi-state data in an online viewer application, and export data to a common format. The viewer application will show the status of data development for Idaho and Montana, as well as GCDB and NGS points, and provide feature-level metadata.

The business planning component will address organizational, funding, operational and related issues associated with a multi-state partnership to establish a Regional Geodetic Reference Center. The two major pieces of the Center will be the MCPD and a multi-state real-time network. We will use the business planning guidance, along with our collective experience, to

shape a practical plan addressing all the major questions. Among those will be identifying what is required for database moderation and administration, continued control point data submittal by surveyors, maintenance of the application and real-time GNSS network, and the mechanism to permit multi-state funding.

This project will advance geospatial coordination and collaboration by its multi-state nature, its team of collaborating organizations working through the issues together, and its aim to perpetuate key Framework data. NGS and the two state BLM offices will provide essential advice and receive augmented geodetic control information that can be used to more efficiently achieve their agency missions. For instance, the Montana Cadastral Mapping Program in conjunction with the Bureau of Land Management Cadastral Surveys Office uses the existing service to improve the accuracy of the Geographic Coordinate Database (GCDB). An improved GCDB results in better Cadastral and Governmental Units Framework, all of which enhances decision making in redistricting, public safety, economic development and land use planning. It will also help adjust the historic expectation for BLM to collect and incorporate geodetic control beyond federal lands and facilitate distributed responsibilities for stewardship.

This proposal is the first bi-state Fifty States project, and the outcome could lead the way to develop other multi-state/regional planning and Framework development activities.

This proposal advances strategic goals and initiatives in both states' plans. Highlights from each state are provided below.

Idaho's primary SDI document is the *Strategic Plan* completed in 2008. In this Plan, Goal 3 (p.15) focuses on Standards, Framework Development and Stewardship and Goal 4 promotes enhanced access and use of SDI data and services. These goals are advanced by specific initiatives in the companion *Business Plan* (2009) embracing two high-priority themes, Geodetic Control and Cadastral. See Table C1 Initiative D4 (p. 77) and Table D2, Cadastral and Geodetic Control description and cost projection (p. 86). Both plans are available at <http://gis.idaho.gov/portal/IGO/stratplan.htm>.

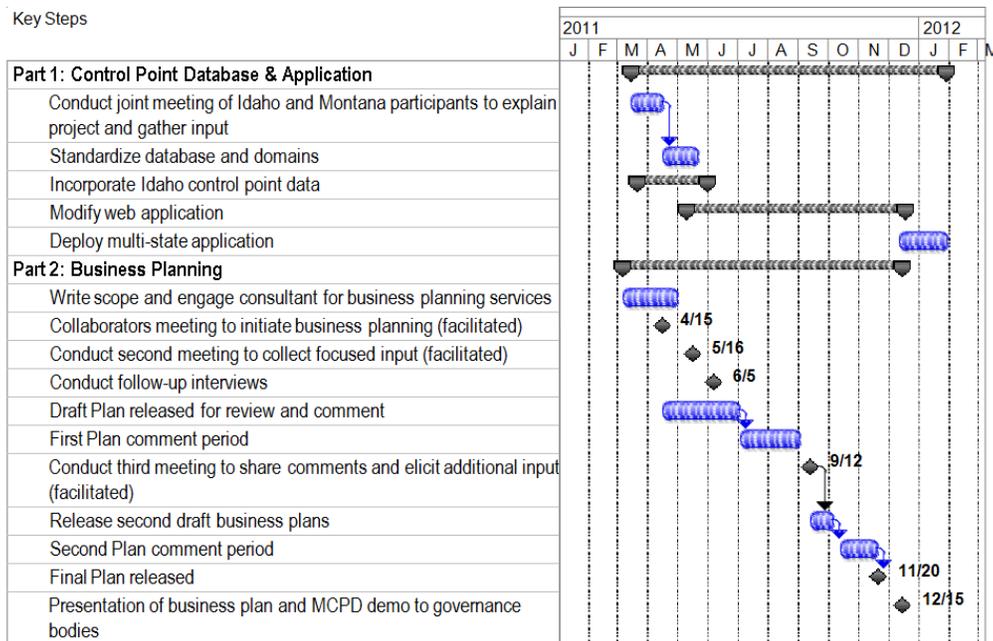
The ratified goals of the Cadastral Reference Workgroup support a seamless, accurate, accessible, sustainable Idaho Cadastral Reference layer, and include "Promoting the use of standards for reporting control data" and "Establish[ing] a central web-based application...to input control point...coordinates..." (<http://gis.idaho.gov/portal/framework/cadastral.htm>, Vision, Goals, Objectives, 4/18/2008). The necessity of establishing a control point database was again recognized in a diagram included in June 2010 meeting notes. Cadastral Reference Meeting Notes, June 25, 2010, p. 1; <http://gis.idaho.gov/portal/framework/cadastral.htm>.

An Idaho Height Modernization Program proposal included this goal in the Project Narrative in 2009: Establish a Spatial Reference Center at Idaho State University in Pocatello, Idaho (IDSRC). The proposal was well-received, but funds through the National Height Modernization Program are no longer available. Current efforts are focused on forming a partnership to establish a real-time network after a successful pilot project in southeast Idaho. A map of the proposed CORS sites is posted at <http://gis.idaho.gov/portal/framework/cadastral.htm>.

This project will further a number of goals and objectives expressed in the *Montana Geospatial Strategic Plan* (pp. 20-23 [http://itsd.mt.gov/content/policy/councils/mliac/docs/Strategic\\_Plan](http://itsd.mt.gov/content/policy/councils/mliac/docs/Strategic_Plan)) to “support standardized and sustainable methodologies to collect, maintain, and disseminate land information” by enhancing means to collect and disseminate geodetic control information, and by reducing redundancies in the collection of geodetic control data. Additionally this project also supports the 2001 *Montana Geodetic Control Strategic Plan* objectives and goals (not available online but echoed in the *Montana Geodetic Control Theme Plan* available at [http://giscoordination.mt.gov/theme%20plans/Geodetic\\_Control\\_2010.doc](http://giscoordination.mt.gov/theme%20plans/Geodetic_Control_2010.doc)), which spearheaded the development and implementation of the Montana Geodetic Control Point database and application. Similar goals are also expressed by the Montana Height Modernization Executive Committee in its *Montana Height Modernization Program Plan* (p. 7, [http://www.mdt.mt.gov/mdt/docs/heightmod/program\\_plan.pdf](http://www.mdt.mt.gov/mdt/docs/heightmod/program_plan.pdf)), which promotes efforts to *Coordinate Position Programs; Centralize Data Holdings; and Integrate Positioning Projects* and recommends establishing a Geodetic Reference Center.

## 2. Project Plan and Managerial Capacity

The overall project will be managed by Keith T. Weber at ISU-Pocatello. Stu Kirkpatrick will act as project manager for part one. Keith T. Weber will manage the tasks in part two. Both parts will proceed concurrently and will engage both states’ partners collaboratively and with balance. A Project Advisory Committee composed of representatives of collaborating organizations will help guide the overall direction of the project and resolve issues as they arise. The PI and key partners all have the capacity and the intent of completing this project on time and on budget. The main steps to complete each part are set out below:



Deliverables:

- 1) Multi-state Control Point Database and Web Application
- 2) Business Plan for Regional Geodetic Reference Center

The outcomes of this joint project will leverage existing capabilities, share resources and expertise, augment the scope of the database and the impact of having access to it. It facilitates BLM business within each state and could be helpful in resolving boundary and other issues between the two states. Surveyors will be able to contribute to the common good, while benefitting from research of existing control in bidding and carrying out survey projects. In addition, the RTN component will make field surveying more efficient and accurate for public and private-sector surveyors. A myriad of public and private business purposes would be similarly impacted. The GIS community will get access to better control, which would be available to improve the GCDB and support a better spatial representation of the Public Land Survey System (referred to as Cadastral Reference in Idaho). The improved Cadastral Reference will improve parcel mapping specifically and all other mapping generally in both states. The business plan will provide a pathway and touchstone for sustainability and governance needed to keep the gains and efficiencies going.

Communications between the states and the parts will be robust. Keith will establish a forum Web presence to collect input and distribute documents and information. Web meeting and telephone and/or video conferencing will be used to maximize participation and minimize travel and related expenses. Each state will use its established general listservs and Web pages to leverage and augment the targeted communications developed for this project.

The plan schedule anticipates completing the project work within the one-year time frame. The partners' commitment to the effort will keep the project tasks on track. Key partners in both states have substantial records of delivering grant projects on time and on budget.

### **3. Skills and Capabilities**

In the capacity of GIS Director at Idaho State University, Keith Weber has acquired over \$8M of research funding since 1998, from organizations such as NASA, NOAA, USDI BLM, and others. He has proven effective leadership and demonstrated effective management in acquiring and meeting the objectives of many awards. Keith is also committed to and actively involved with The Idaho Map activities and provides critical leadership in academic opportunities and projects throughout the state. Indeed one role of the GIS Director at Idaho State University is the promotion and support of GIS activities outside the University and support for the statewide GIS community. He is on schedule to complete a successful Fifty States grant project to develop business plans for Idaho Regional Resource Centers.

Other partners also have substantial experience in project management. Stewart Kirkpatrick, Chief of the Montana Base Map Service Center, and Gail Ewart, Geospatial Information Officer in the Idaho Department of Administration, have both managed successful Fifty States grant projects. The nature of the project activities proposed here are logical extensions to projects already accomplished by Keith, Stu, and Gail. In addition, the Idaho Geospatial Office received esri's Special Achievement in GIS Award (2010) acknowledging Idaho's progress in SDI. Idaho's progress includes establishing a policy for data standard development and its first Framework data standard, two successful Framework pilots with automated stewardship (Roads and Structures), and transition to more robust governance.

Other participants have been active in SDI activities. Donna Pitzer is Chair of the Cadastral Technical Working Group for Idaho, and RJ Zimmer is Chair of the Geodetic Control Technical Working Group for Montana. These team players have demonstrated commitment to the progression of geospatial technology for SDI and, by extension, NSDI activities, and will make key contributions to the success of this project. Additional experienced Idaho partners will be involved in this project.

#### 4. Commitment to Effort

<b>Partner Organizations</b>		
<b>Name</b>	<b>Role</b>	<b>Level of Support</b>
Stewart Kirkpatrick and Robert Holliday, MT DOA	Technical lead	Donate MCPD; Program Management (PM) services for technical scope, outreach assistance, assure alignment with SDI strategies and plans
Gail Ewart, Idaho Geospatial Office, OCIO, DOA	GIO Guidance	Document editor, outreach assistance, assure alignment with TIM strategic and business plans
Robert Smith, Idaho Geospatial Office, OCIO, DOA	Collaborator	Gather and organize survey control and help load into the database
MT Geodetic Control Workgroup	Collaborator	MCPD technical advice; business plan input
BLM Montana	Advisory Team Member	Advisory, help shape deliverables
National Geodetic Survey	Federal partner, Advisory Team Member	Geodetic control expertise and knowledge of NGS strategy and implementation plans
BLM Montana	Advisory Team Member	Advisory, help shape deliverables
BLM Idaho	Advisory Team Member	Advisory, help shape deliverables
GIS Training and Research Center, ISU	PI, Business Plan Lead	Overall project management, business plan development
ID Geodetic Control TWG of IGCEC	Collaborator	RTN Technical advice, business planning input gathering, outreach
ID Cadastral Reference Workgroup, Cadastral TWG of IGCEC	Collaborator	Technical input MCPD, Business Plan input, outreach
Dept. of Interior, U.S. Bureau of Reclamation, Middle Snake Field Office, Chair of the Idaho Cadastral TWG	Advisory Team Member	Lead Idaho's collaborative input; shape outcomes
D J & A, P.C., Chair of Montana Geodetic Control Workgroup	Advisory Team Member	Lead Montana's collaborative input; shape outcomes

note: not all partner organizations have been included in the match contribution table.