

# INTRODUCTION TO THE GEOPOSITIONING COOPERATIVE AND THE IDAHO/MONTANA MULTI-STATE CONTROL POINT DATABASE

Donna Pitzer, Reclamation

Keith T. Weber, GISP, Idaho State University

Stewart Kirkpatrick, Montana State Library

# GEOPOSITIONING COOPERATIVE

---

Federal Geographic Data Committee (FGDC)

Category 4 CAP Award

(March 2011-February 2012)

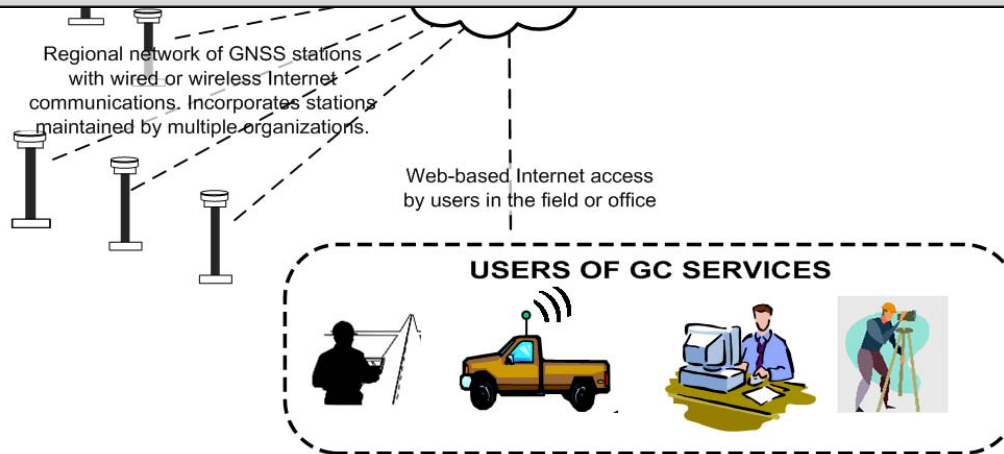
- Business Plan for Geopositioning Cooperative
  - Enhanced Multi-state Control Point Database
  - Global Navigation Satellite Real-time Network

# GEOPOSITIONING COOPERATIVE MISSION

## Geopositioning Cooperative (GC) Administration

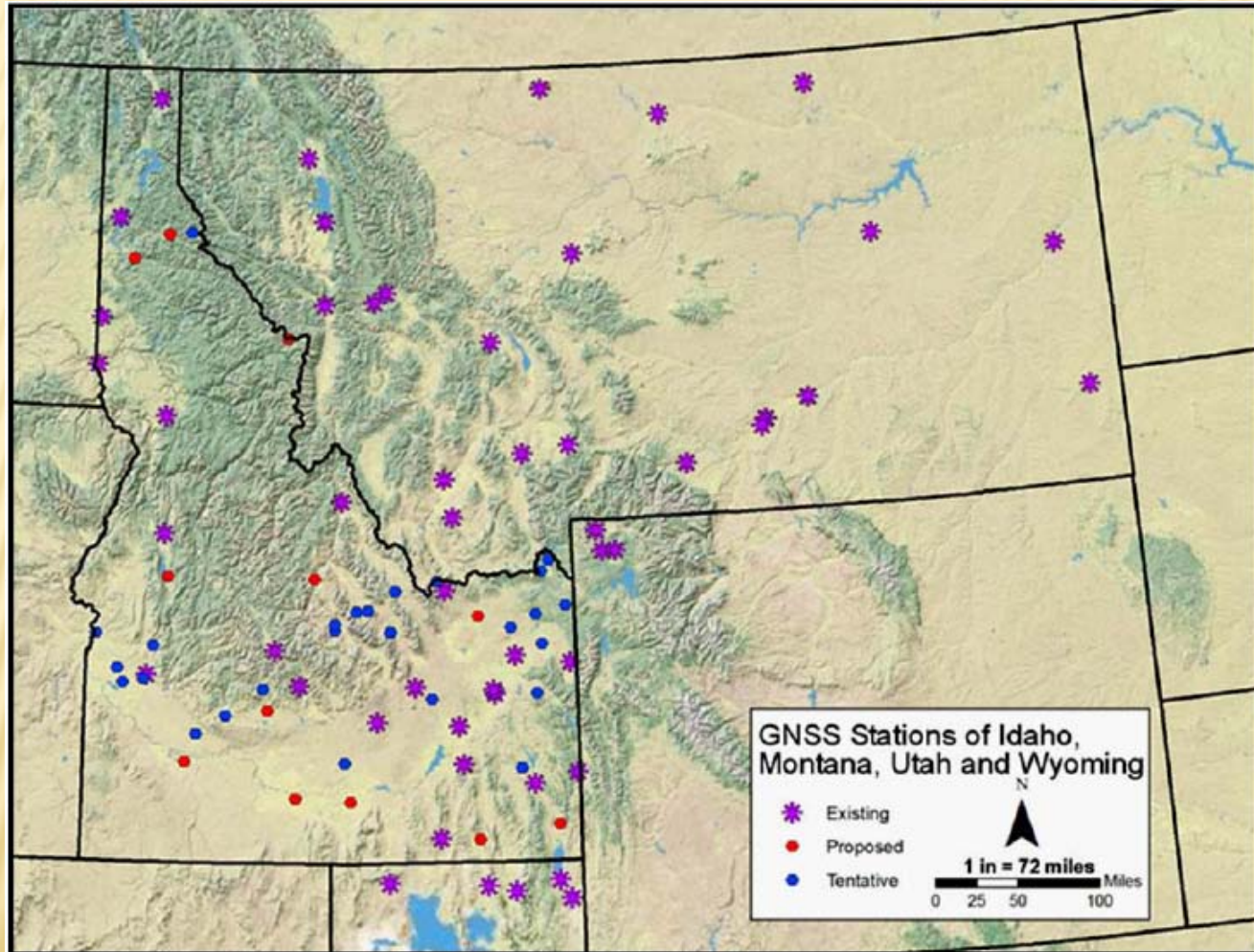


*Establish a sustainable geopositioning cooperative that serves the needs of the broad user communities of Idaho and Montana by providing effective access to high-quality geodetic control information, GNSS Infrastructure, and related services.*

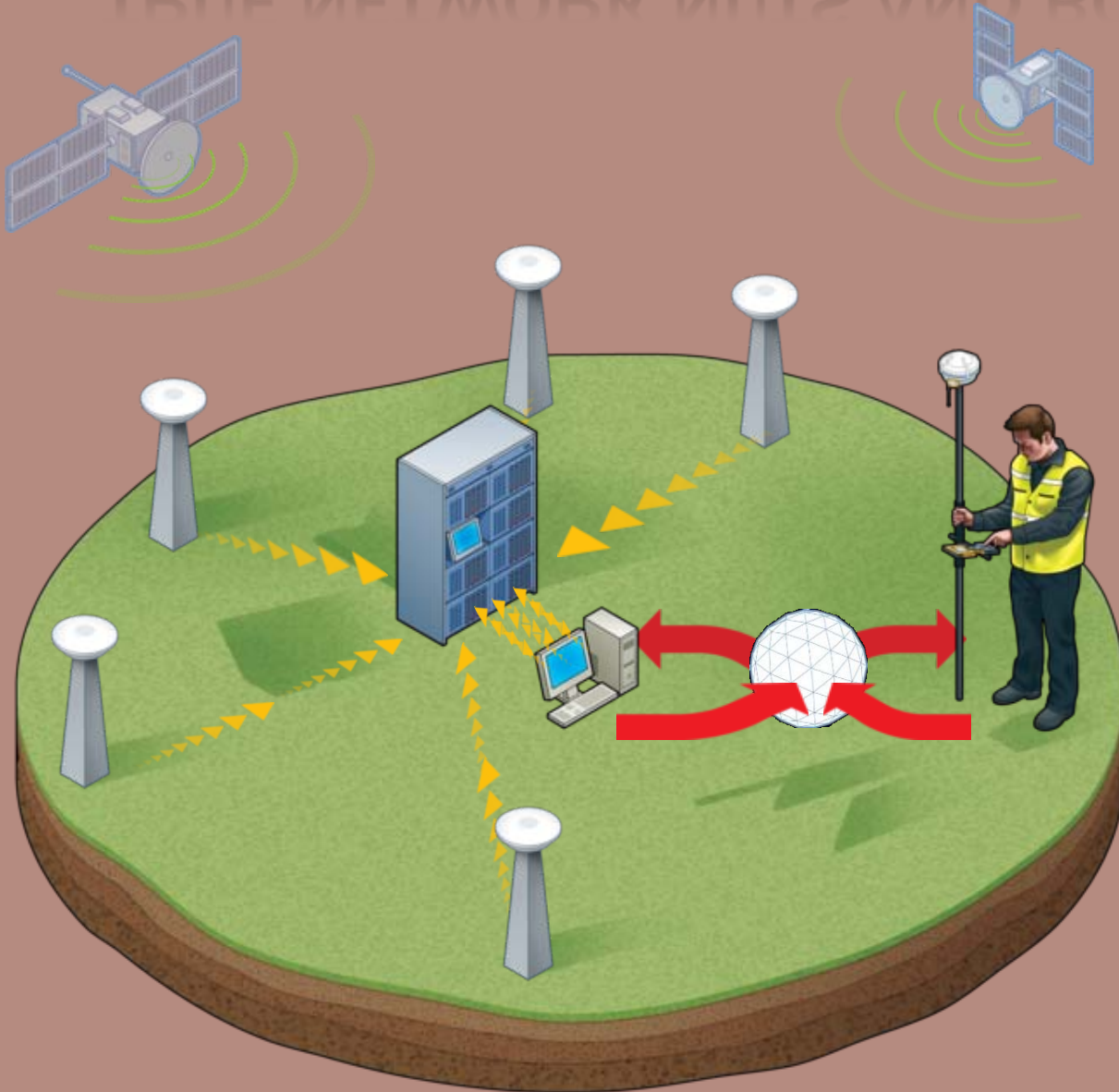




# GNSS REAL-TIME NETWORK



# TRUE NETWORK NUTS AND BOLTS



Select data source

Mount point	Identifier
Halswell_RTCM2.1	Halswell_RTCM...
Halswell_RTCM2.3	Halswell_RTCM...
Halswell_RTCM3.0	Halswell_RTCM...
Multistation_5010	Multistation_501...
Redwood_RTCM2.1	Redwood_RTCM...
Redwood_RTCM2.3	Redwood_RTCM...
Redwood_RTCM3.0	Redwood_RTCM...
TN7_RTCM2_1	TN7_RTCM2_1

No survey PDOP:2.4

Esc All Refresh Enter

# **MULTI-STATE CONTROL POINT DATABASE**

---

## **MCPD**



# HISTORY OF THE MCPD

---

A group of surveyors formed the Montana Geodetic Control Working (MTGCWG) in 2000 in order to develop strategies to facilitate the sharing of control point information for the following reasons:

- Less than 1% of geodetic and mapping control is reported to the National Geodetic Survey (blue-booked).
- Public funds are often used to create surveying or mapping and control that is used for only one project.
- GIS and surveyors can reduce project costs and improve project quality.

The primary strategy was to develop an online control point database application named the Montana Control Point Database (MCPD) which premiered in 2010.

In 2011 the Idaho Geodetic Control and Cadastral Reference Working Group joined with the MTGCWG on a Federal Geographic Data Committee grant to expand the Montana Control Point Database to a Multi-state Control Point database.

MCPD is currently housed at the Montana State Library.

# PURPOSE OF THE MCPD

---

**Find and publish survey and mapping control contributed by Montana and Idaho's professional land surveyors.**

**For Surveyors, the MCPD provides:**

- **a standardized, consistent format for data collection and storage.**
- **an opportunity for off-site data back up.**
- **one stop access to control point data thus reducing or eliminating research costs.**

**For GIS mappers, the MCPD provides:**

- **access to high quality control point information for improving geospatial data.**



# MCPD VIEWER OVERVIEW

---

## Behind the scenes

Database

Application

Viewer

Services

Submitting data

# MCPD VIEWER OVERVIEW

The screenshot displays the MCPD Viewer interface. On the left is a Google Maps view of the Idaho-Montana border region. In the center is a 'Welcome' window with the following content:

**Multi-state Control Point Database**

Welcome | Disclaimer | Credits

**Welcome to the Montana and Idaho Multi-state Control Point Database!**

Here you will find survey and mapping control contributed by Montana and Idaho's professional land surveyors who are committed to improving the positional accuracy of geospatial information.

The public may use this site to search for and download survey and mapping control points that are unique to the Montana and Idaho data set. For your convenience we also provide links to the National Geodetic Survey (NGS) control point data sheets and corner coordinates of the Geographic Coordinate Database (GCDB) of the US Bureau of Land Management. The GCDB information provided here is for reference information only and is not regularly updated. For the most current GCDB information, go to [www.geocommunicator.gov](http://www.geocommunicator.gov).

Professional Land Surveyors who are licensed to practice in the States of Idaho and Montana may use this site to contribute control point records to make them available to the public.

Enter

On the right is a control panel with map style options (Terrain, Satellite, Hybrid, Road) and a 'MCPD' section containing:

- Database Search
- Map Search
- Measure Tool
- Clear Map
- Print Map
- Street View
- Show Tooltips (checked)
- Control Points:
  - MCPD
  - GCDB
  - NGS
- Surveyor Login
- Excel Template - Help

# MCPD VIEWER OVERVIEW

The screenshot displays the MCPD Viewer interface. A map of Idaho is visible in the background, showing locations like Lethbridge, Hat, and Minot. A 'Welcome' dialog box is open in the center, titled 'Multi-state Control Point Database'. The dialog has a header with three images and a sub-header with 'Welcome', 'Disclaimer', and 'Credits' buttons. To the right, a sidebar contains map navigation options: 'Terrain', 'Satellite', 'Hybrid', and 'Road'. Below these are buttons for 'Database Search', 'Map Search', 'Measure Tool', 'Clear Map', 'Print Map', and 'Street View'. At the bottom, a 'Windows Media Player' window is partially visible.

1. The coordinates available in this database are stored as provide by the surveyor. The administrators of this database do not modify, re-project, adjust, transform, reformat, update, or change in any way the coordinate values provided herein.
2. There could be multiple records for what is, purported to be, the same point, i.e. a surveyor or surveyors might provide competing coordinates for a section corner. The administrators and hosts of this database **do not adjudicate** conflicting or competing coordinates for any point in this database. It is up to you the user, to decide which coordinate to use, if any. Caveat Emptor!!
3. This application may from time to time create **mapping** coordinates for each point that may be different from those contained in the database record. These **mapping** coordinates are for the sole purpose of generating a graphical display. These *mapping* coordinates should not be used for any purposes or relied upon in any way. This application presents, and you should use **only** the surveyor supplied coordinates, extracted from the database, for viewing and downloading (see 1. above).



# MCPD VIEWER OVERVIEW

Pan & Zoom Controls

Map Search

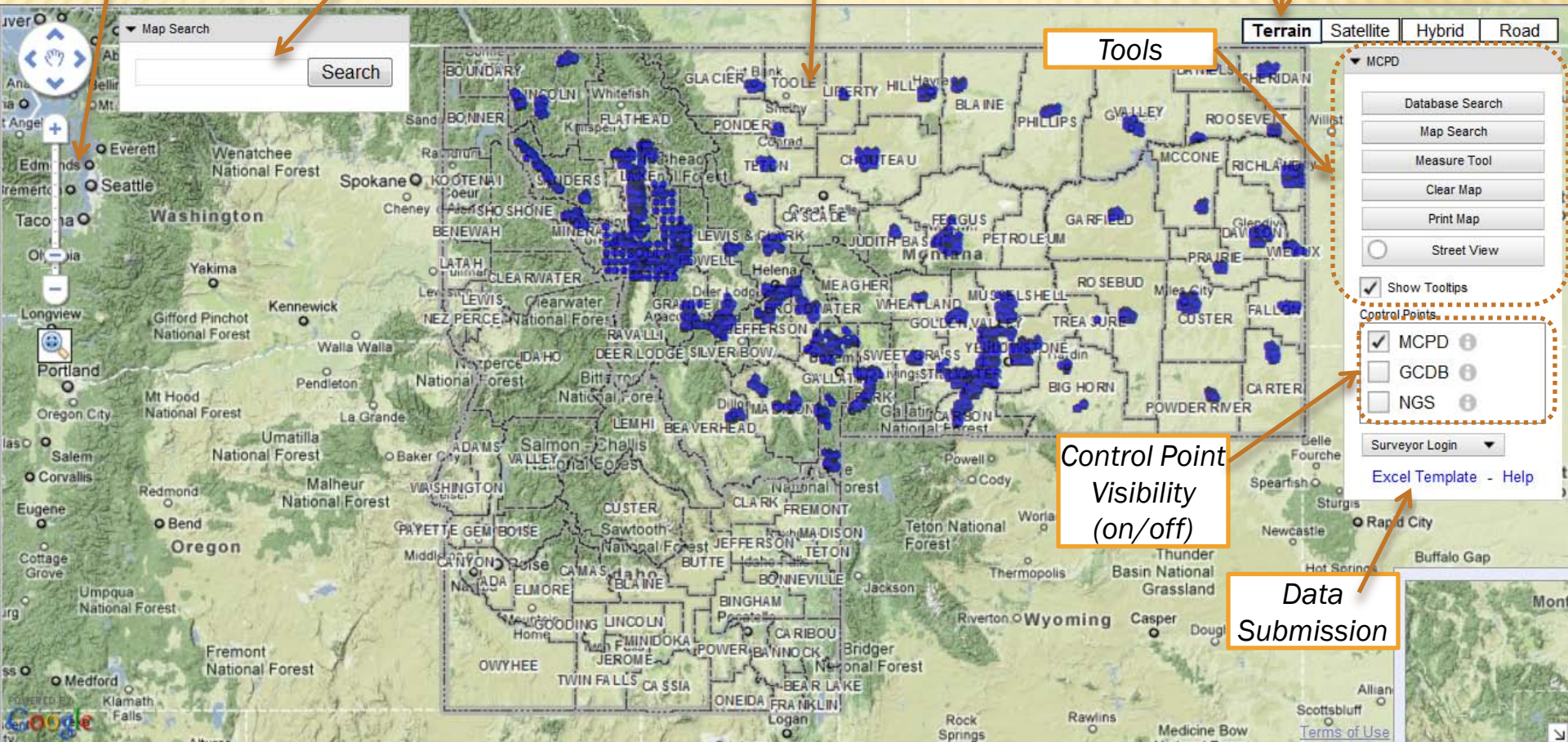
Map Window

Background Map Control

Tools

Control Point Visibility (on/off)

Data Submission



MCPD

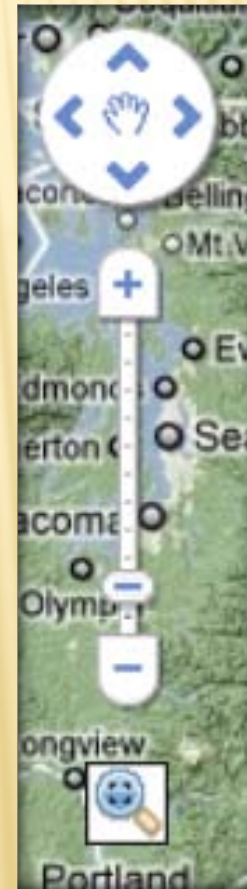
# MAP CONTROLS FOR VIEW & DISPLAY



# PAN & ZOOM CONTROLS

The MCPD viewer implements the standard Google Maps™ zoom and pan controls for zooming in and out and moving the map display around.

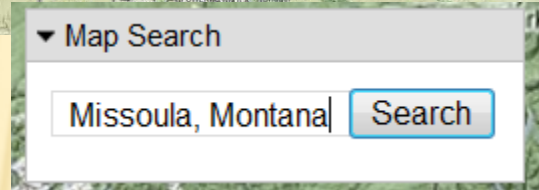
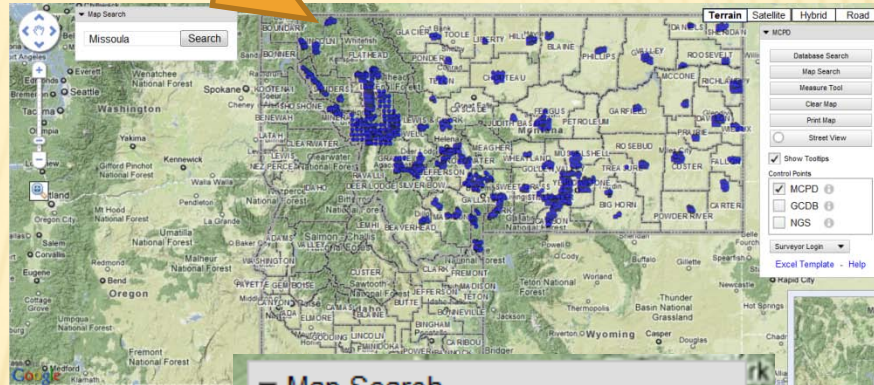
The magnifying glass is used to draw a rubber band box for zooming in.





# MAP SEARCH

The Map Search tool is a Google Maps tool that will search for a *place* on the map

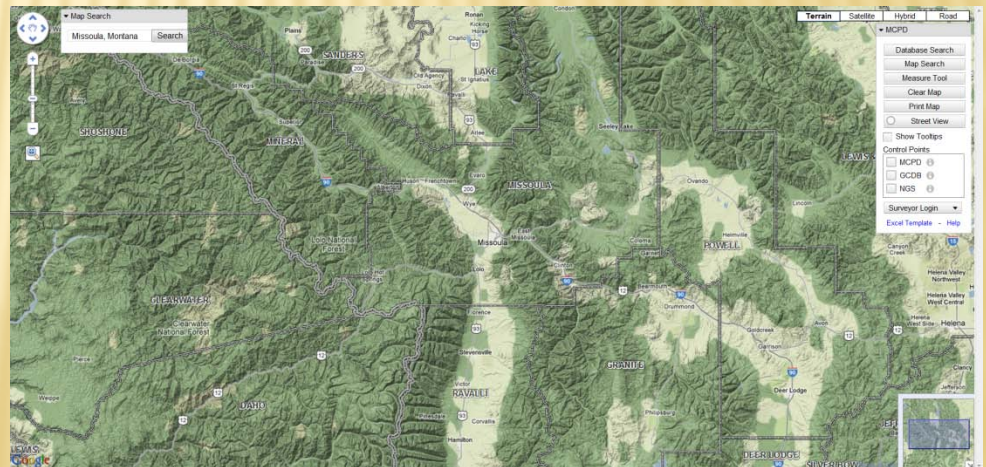


Example:

Find Missoula

1. Type Missoula, Montana in the Map Search edit box (*not case sensitive*)
2. Click Search
3. The map will pan and may also zoom (depending on your present zoom level) to your area.

You may also enter a street address, adding city and state.





# BACKGROUND MAP CONTROL

This menu provides alternative background maps based on the Google Maps™ engine.

To use this control, click on the tab for the background map of your choice.



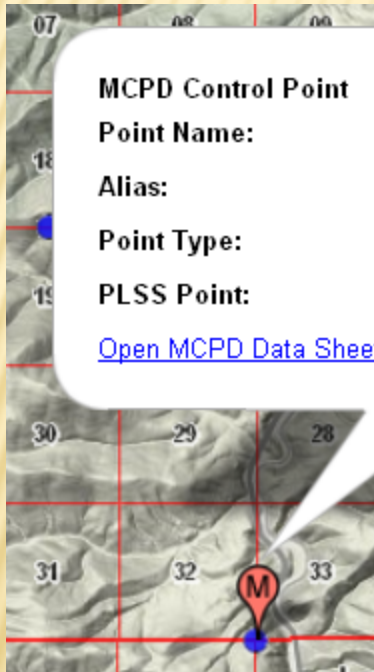




MCPD

# QUERYING AND RETRIEVING CONTROL POINTS

# MAP CLICK INFO



## CONTROL POINT DATASHEET

Multi-state Control Point Database - Date extracted on: 3/27/2012

### CONTROL POINT INFORMATION

Point Name:	6460	General Location	
Point Alias:	NA	Meridian:	NA
Is this a PLSS Corner:	NA	Township:	NA
GCDB Point ID:	MT20T0240n0040W400700	Range:	NA
Monument Type:	NA	Section:	NA
Monument Description:			

### HORIZONTAL COORDINATE INFORMATION

Northing:	405427.297 m	Easting:	404657.577 m
Horizontal Accuracy:	0.03 m	Horizontal Method:	Geodetic GPS
Horizontal Coordinate System:	Montana State Plane Meters	Horizontal Datum:	NAD83 (CORRS96)

### VERTICAL COORDINATE INFORMATION

Elevation:	1160.33 m	Vertical Accuracy:	0.1 m
Vertical Datum:	NAVD88	Vertical Method:	
Vertical Method:	GPS and Geoid Model		

### PROJECT INFORMATION

Project Name:	GCDB Enhancement -Highline	Project Date:	3/16/2007
Project ID	DJA-5247		
Comments:			

### SURVEYOR CONTACT INFORMATION

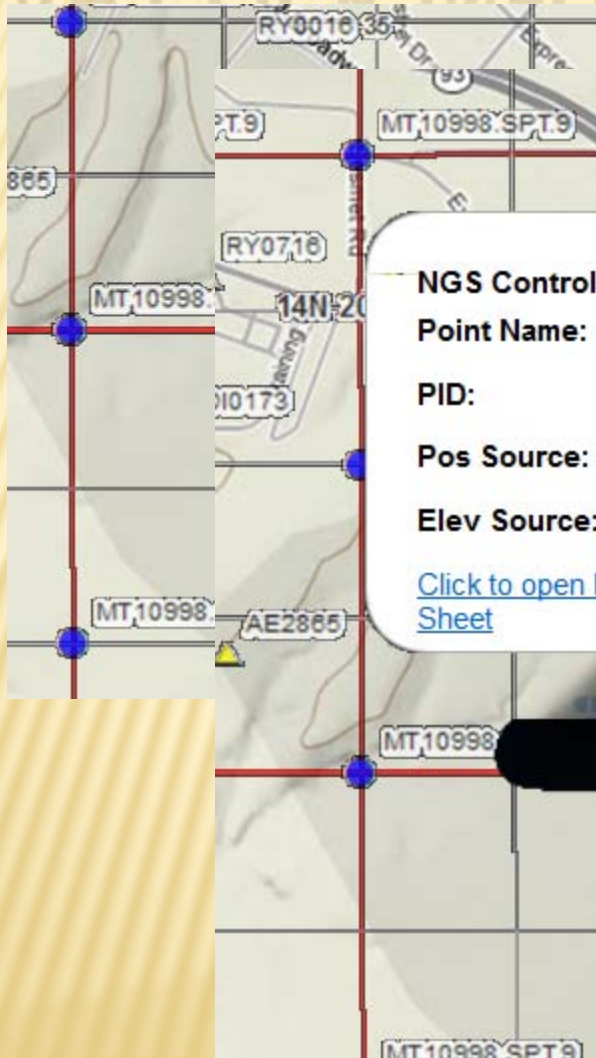
Surveyor:	Kurt A. Luebke	License:	MT13237
Phone:	406-721-4320	Business:	DJ&A, P.C.
Business Address:	3203 Russell St.	Address 2:	NA
City:	Missoula	State:	MT
Zip Code:	59801	Email:	kurtl@djanda.com



MCPD ID: MT13237.CPT.2112



# MAP CLICK INFO



## The NGS Data Sheet

See file [dsdata.txt](#) for more information about the datasheet.

```
DATABASE = NGSIDB , PROGRAM = datasheet95, VERSION = 7.87.6
1 National Geodetic Survey, Retrieval Date = MARCH 27, 2012
*****
NU0071
NU0071 DESIGNATION - C 164
NU0071 PID - NU0071
NU0071 STATE/COUNTY- ID/BANNOCK
NU0071 USGS QUAD - POCA TELLO NORTH (1971)
NU0071
NU0071 *CURRENT SURVEY CONTROL
-----
NU0071* NAD 83(1986)- 42 55 14. (N) 112 27 35. (W) SCALED
NU0071* NAVD 88 - 1363.141 (meters) 4472.24 (feet) ADJUSTED
-----
NU0071 GEOID HEIGHT- -12.74 (meters) GEOID09
NU0071 DYNAMIC HT - 1362.363 (meters) 4469.69 (feet) COMP
NU0071 MODELED GRAV- 980,002.3 (mgal) NAVD 88
NU0071
NU0071 VERT ORDER - FIRST CLASS I
NU0071
NU0071.The horizontal coordinates were scaled from a topographic map and have
NU0071.an estimated accuracy of +/- 6 seconds.
NU0071.
NU0071.The orthometric height was determined by differential leveling and
NU0071.adjusted in June 1991.
NU0071
NU0071.WARNING-Repeat measurements at this control monument indicate possible
NU0071.vertical movement.
NU0071
NU0071.The geoid height was determined by GEOID09.
NU0071
NU0071.The dynamic height is computed by dividing the NAVD 88
NU0071.geopotential number by the normal gravity value computed on the
NU0071.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
NU0071.degrees latitude (g = 980.6199 gals.).
NU0071
NU0071.The modeled gravity was interpolated from observed gravity values.
NU0071
NU0071; North East Units Estimated Accuracy
NU0071;SPC ID E - 139,320. 176,070. MT (+/- 180 meters Scaled)
NU0071
NU0071 SUPERSEDED SURVEY CONTROL
-----
NU0071
NU0071 NGVD 29 (08/20/92) 1362.087 (m) 4468.78 (f) ADJUSTED 1 1
NU0071
NU0071.Superseded values are not recommended for survey control.
NU0071.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
NU0071.See file dsdata.txt to determine how the superseded data were derived.
NU0071
NU0071 U.S. NATIONAL GRID SPATIAL ADDRESS: 12TUN808530 (NAD 83)
NU0071
NU0071 MARKER: DB = BENCH MARK DISK
NU0071 SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
```

# MAP CLICK INFO





# **MULTIPLE POINT DATABASE SEARCH**

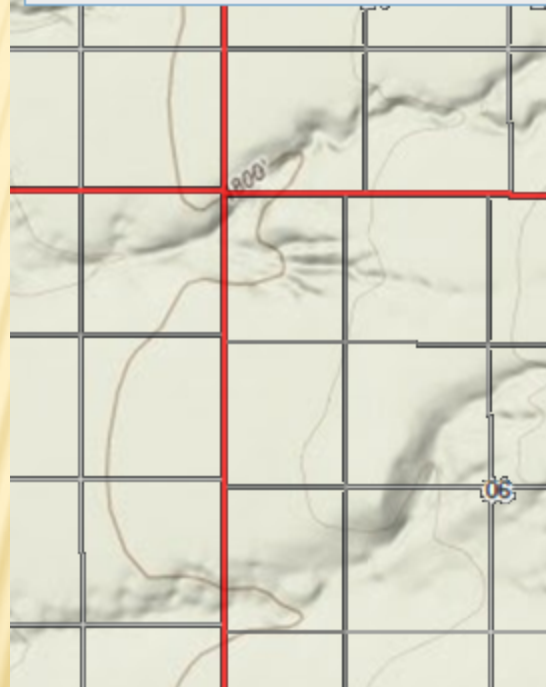
# MCPD VIEWER OVERVIEW

The screenshot displays the MCPD Viewer interface, which is a web-based application for viewing and interacting with spatial data. The main component is a map of the Pacific Northwest, showing county boundaries and numerous blue data points. The map is overlaid with a grid of county names, including Boundary, Lincoln, Flathead, Pondera, Teton, Chouteau, Phillips, Valley, Roosevelt, Blaine, Hill, Liberty, Toole, Glacier, and others. The interface includes a search bar at the top left with a 'Search' button. On the right side, there is a 'Tools' panel with a 'Tools' label and a list of functions: Database Search, Map Search, Measure Tool, Clear Map, Print Map, and Street View. Below these are checkboxes for 'Show Tooltips' and 'Control Points', with 'MCPD' checked. At the bottom right, there is a 'Surveyor Login' dropdown menu and a link to 'Excel Template - Help'. The map also shows major cities like Seattle, Portland, and Spokane, and various national forests.



# SELECT CONTROL POINT DATA:

The **Database Search** tool allows you to export MCPD or GCDB control point data to text or KML file through an attribute query interface. **Click to Close.**



Hybrid Road

▼ MCPD

Database Search

Map Search

Measure Tool

Clear Map

Print Map

Street View

Show Tooltips

Control Points

MCPD ⓘ

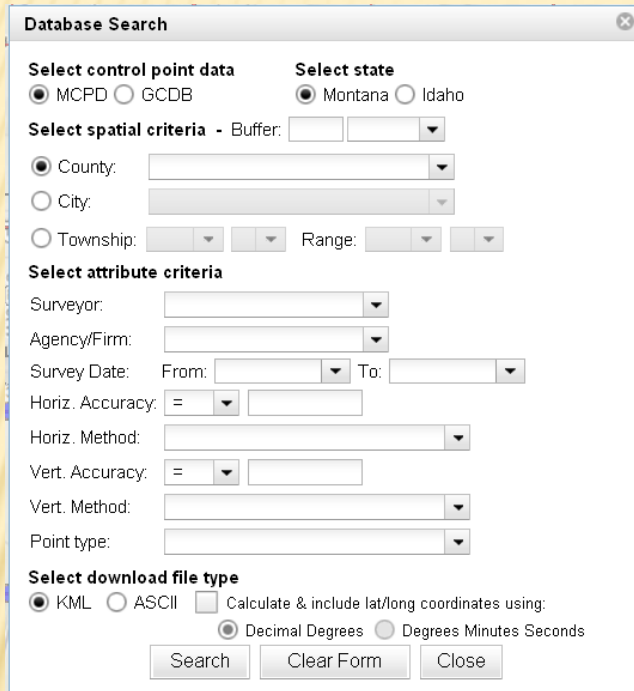
GCDB ⓘ

NGS ⓘ

Surveyor Login ▼

[Excel Template](#) - [Help](#)

# The Database Search tool can query for MCPD or GCDB points



**Database Search**

**Select control point data**  
 MCPD  GCDB

**Select state**  
 Montana  Idaho

**Select spatial criteria - Buffer:** [ ] [ ] [v]

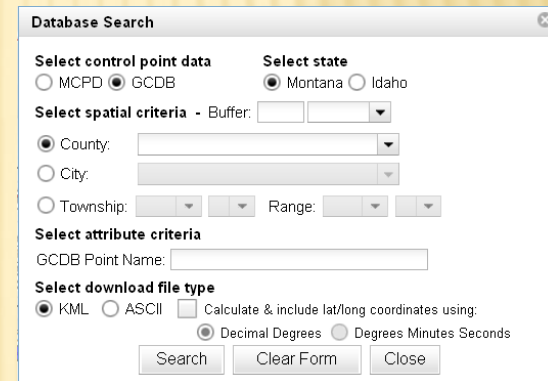
County: [v]  
 City: [v]  
 Township: [v] [v] Range: [v] [v]

**Select attribute criteria**  
Surveyor: [v]  
Agency/Firm: [v]  
Survey Date: From: [v] To: [v]  
Horiz. Accuracy: [=] [v]  
Horiz. Method: [v]  
Vert. Accuracy: [=] [v]  
Vert. Method: [v]  
Point type: [v]

**Select download file type**  
 KML  ASCII  Calculate & include lat/long coordinates using:  
 Decimal Degrees  Degrees Minutes Seconds

[ Search ] [ Clear Form ] [ Close ]

**MCPD QUERY FORM**



**Database Search**

**Select control point data**  
 MCPD  GCDB

**Select state**  
 Montana  Idaho

**Select spatial criteria - Buffer:** [ ] [ ] [v]

County: [v]  
 City: [v]  
 Township: [v] [v] Range: [v] [v]

**Select attribute criteria**  
GCDB Point Name: [v]

**Select download file type**  
 KML  ASCII  Calculate & include lat/long coordinates using:  
 Decimal Degrees  Degrees Minutes Seconds

[ Search ] [ Clear Form ] [ Close ]

**GCDB QUERY FORM**



# MCPD POINT SELECTION CRITERIA

Control dataset to query

Location Query

Who and when criteria

Accuracy criteria

Point Type

Export file format

Perform the Query

**Database Search**

**Select control point data**  
 MCPD  GCDB

**Select state**  
 Montana  Idaho

**Select spatial criteria** - Buffer:

County:

City:

Township:     Range:

**Select attribute criteria**

Surveyor:

Agency/Firm:

Survey Date: From:   To:

Horiz. Accuracy: =

Horiz. Method:

Vert. Accuracy: =

Vert. Method:

Point type:

**Select download file type**  
 KML  ASCII  Calculate & include lat/long coordinates using:  
 Decimal Degrees  Degrees Minutes Seconds

State to query

All options that you select on this form operate as AND queries to the database.

Add geographic coordinates

# EXAMPLE QUERY

Find MCPD points that are:

✓ In Missoula County, Montana

AND

✓ Have horizontal error less than 5 units

AND

✓ Calculate and include lat/long coordinates

**Database Search**

Select control point data:  MCPD  GCDB

Select state:  Montana  Idaho

Select spatial criteria - Buffer:

County: MISSOULA

City:

Township:   Range:

Select attribute criteria

Surveyor:

Agency/Firm:

Survey Date: From:  To:

Horiz. Accuracy: <  5

Horiz. Method:

Vert. Accuracy: =

Vert. Method:

Point type:

Select download file type

KML  ASCII  Calculate & include lat/long coordinates using:

Decimal Degrees  Degrees Minutes Seconds

Results:

667 MCPD points meet all those criteria

**Database Search Results**

[667 control points found](#)  
(Right-click to "save-as")

[pan](#) [zoom](#)

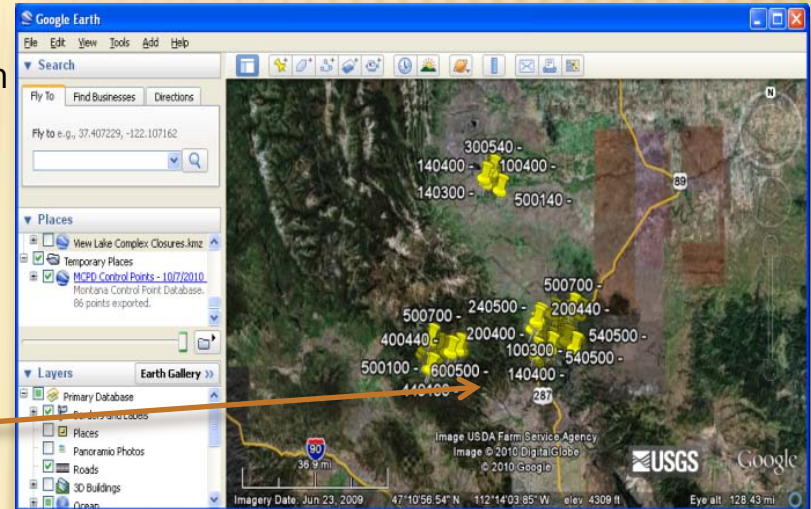
[toggle markers](#)

[search again](#)

# RESULTS – KML OUTPUT

Exporting selected points to KML.

- 1) KML markers are added to the MCPD Viewer map.
- 2) Download Control Points  
This options puts a KML file on your computer, which Google Earth can read.



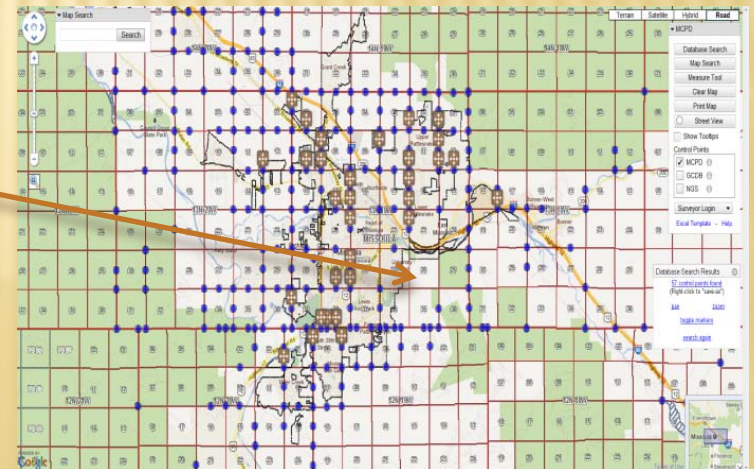
Database Search Results

[57 control points found](#)  
(Right-click to "save-as")

[pan](#) [zoom](#)

[toggle markers](#)

[search again](#)





# EXPORT MCPD TO ASCII



Exports to a comma delimited text file that you may save on your computer.

All the point data are extracted from each record of your selected points.

Bring into a spreadsheet or load into your GPS unit.

```
10/7/2010 1:32:44 PM
86 total control points found
PointName,PointAlias,PLSSCorner,PointType,GCDBPOINTID,Northing,Easting,HorizontalUnits,HorizontalAccuracy,Horiz
200700,,,Section Corner,200700,309284.037,408327.146,m,0.03,m,NAD83 (COR96),Geodetic GPS,1113.09,m,NAVD88,0.1,m
100400,,,Section Corner,100400,305879.83,359044.041,m,0.03,m,NAD83 (COR96),Geodetic GPS,1388.55,m,NAVD88,0.1,m
340400,,,Quarter-Section Corner,340400,305697.192,363004.611,m,0.03,m,NAD83 (COR96),Geodetic GPS,1413.87,m,NAVI
600200,,,Section Corner,600200,310984.025,405285.006,m,0.03,m,NAD83 (COR96),Geodetic GPS,1247.07,m,NAVD88,0.1,m
500540,,,Quarter-Section Corner,500540,308410.501,355907.262,m,0.03,m,NAD83 (COR96),Geodetic GPS,1427.71,m,NAVI
300500,,,Section Corner,300500,364577.484,382683.049,m,0.03,m,NAD83 (COR96),Geodetic GPS,1236.87,m,NAVD88,0.1,m
300640,,,Quarter-Section Corner,300640,308491.335,409915.123,m,0.03,m,NAD83 (COR96),Geodetic GPS,1066.76,m,NAVI
100200,,,Section Corner,100200,310942.56,406844.625,m,0.03,m,NAD83 (COR96),Geodetic GPS,1131.19,m,NAVD88,0.1,m
300540,,,Quarter-Section Corner,300540,365382.177,382706.691,m,0.03,m,NAD83 (COR96),Geodetic GPS,1234.88,m,NAVI
400500,,,Section Corner,400500,306328.671,401881.583,m,0.03,m,NAD83 (COR96),Geodetic GPS,1333.98,m,NAVD88,0.1,m
0300,,,Quarter-Section Corner,340300,304455.343,353359.759,m,0.03,m,NAD83 (COR96),Geodetic GPS,1363.9,m,NAVD8
140,,,Section Corner,340640,308455.802,410218.112,m,0.03,m,NAD83 (COR96),Geodetic GPS,1122.12,m,NAVD88,0.1,m
```

# GCDB QUERY FORM

The screenshot shows a web-based form titled "Database Search" with a close button in the top right corner. The form is organized into several sections:

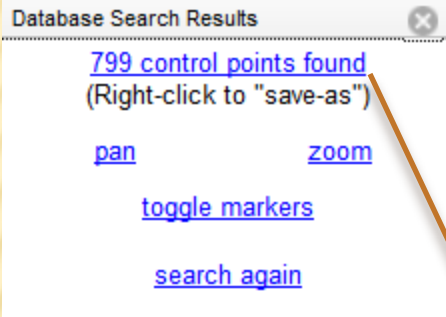
- Select control point data:** Two radio buttons are present: "MCPD" (unselected) and "GCDB" (selected).
- Select state:** Two radio buttons are present: "Montana" (selected) and "Idaho" (unselected).
- Select spatial criteria:** A "Buffer:" label is followed by two empty input boxes and a dropdown arrow. Below this are three options:
  - County:** A radio button (selected) followed by a dropdown menu.
  - City:** A radio button (unselected) followed by a dropdown menu.
  - Township:** A radio button (unselected) followed by two dropdown menus.
- Range:** A label followed by two dropdown menus.
- Select attribute criteria:** A label "GCDB Point Name:" followed by a text input field.
- Select download file type:** Three radio buttons: "KML" (selected), "ASCII" (unselected), and "Calculate & include lat/long coordinates using:" (unselected). Under the last option are two radio buttons: "Decimal Degrees" (selected) and "Degrees Minutes Seconds" (unselected).

At the bottom of the form are three buttons: "Search", "Clear Form", and "Close".

You may search for GCDB points by County, City, Township/Range AND GCDB Point Name

*Note: When searching by **GCDB Point Name** you may enter the full GCDP ID (e.g. MT200010S0420E0\_100100) or a portion of it such as 100100*

# GCDB EXPORT TO ASCII



GCDB export contains

- GCDB ID
- Coordinates

```
7/2010 1:46:48 PM
2052 total control points found
POINTID, POINTLAB, XCOORD, YCOORD, PLSSID, ELEV, COORDPROC, ERRORX, ERRORY
MT200110N0050W0_660600,660600,-112.17354039,46.73302269,MT200110N0050W0,6500,GMM,125,128
MT200110N0050W0_901050,901050,-112.26510331,46.74317069,MT200110N0050W0,6500,GMM,34,33
MT200110N0050W0_100660,100660,-112.28421975,46.74305322,MT200110N0050W0,6500,GMM,0,0
MT200110N0050W0_360300,360300,-112.23688631,46.68874614,MT200110N0050W0,6500,GMM,17,15
MT200110N0050W0_620300,620300,-112.18395897,46.68855122,MT200110N0050W0,6500,GMM,5,6
MT200110N0050W0_950106,950106,-112.27365892,46.738625,MT200110N0050W0,6500,GMM,67,64
MT200110N0050W0_160260,160260,-112.27898722,46.68526575,MT200110N0050W0,6500,GMM,6,6
MT200110N0050W0_420520,420520,-112.22606883,46.72174358,MT200110N0050W0,6500,GMM,118,113
MT200110N0050W0_908030,908030,-112.19458442,46.70450744,MT200110N0050W0,6500,GMM,4,5
MT200110N0050W0_906010,906010,-112.20023694,46.70449906,MT200110N0050W0,6500,GMM,5,5
MT200110N0050W0_320400,320400,-112.24748906,46.70327261,MT200110N0050W0,6500,GMM,28,28
MT200110N0050W0_140700,140700,-112.284131,46.74793269,MT200110N0050W0,6500,GMM,4,3
MT200110N0050W0_320700,320700,-112.24735242,46.74789519,MT200110N0050W0,6500,GMM,18,17
MT200110N0050W0_440670,440670,-112.22108344,46.74544514,MT200110N0050W0,6500,GMM,65,57
MT200110N0050W0_520340,520340,-112.205178,46.69609419,MT200110N0050W0,6500,GMM,89,84
MT200110N0050W0_950139,950139,-112.18205433,46.69595603,MT200110N0050W0,6500,GMM,14,16
MT200110N0050W0_919020,919020,-112.17978119,46.69209022,MT200110N0050W0,6500,GMM,4,5
MT200110N0050W0_917030,917030,-112.17977247,46.69175353,MT200110N0050W0,6500,GMM,6,6
MT200110N0050W0_300100,300100,-112.25263986,46.74786186,MT200120N0050W0,5000,GMM,18,17
MT200120N0060W0_700126,700126,-112.28569758,46.74737578,MT200120N0060W0,5500,GMM,3,3
MT200120N0060W0_900495,900495,-112.28559858,46.74701864,MT200120N0060W0,5500,GMM,6,5
MT200110N0050W0_320220,320220,-112.24744247,46.67794044,MT200110N0050W0,6500,GMM,5,5
MT200110N0050W0_950186,950186,-112.21567739,46.67594881,MT200110N0050W0,6500,GMM,5,5
MT200110N0050W0_933100,933100,-112.21795269,46.67519647,MT200110N0050W0,6500,GMM,70,79
MT200110N0050W0_260120,260120,-112.25800122,46.66350936,MT200110N0050W0,6500,GMM,15,17
MT200110N0050W0_300120,300120,-112.25275208,46.66349867,MT200110N0050W0,6500,GMM,15,17
MT200110N0050W0_933160,933160,-112.19945119,46.66349003,MT200110N0050W0,6500,GMM,5,4
```

*Tip!*  
Load these into  
your GPS to aid in  
corner searches.



# MAP SEARCH

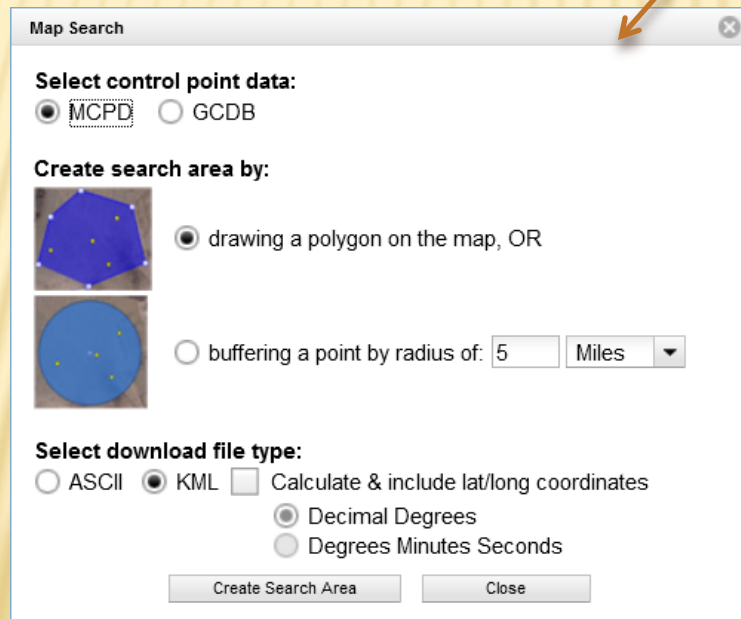
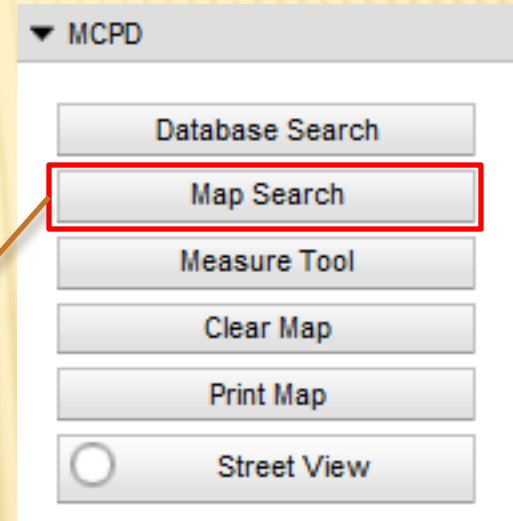
---

MAP SEARCH

# MCPD SELECT TOOL

The Map Search tool interactively selects points on the MCPD map by

- drawing a polygon around your area of interest
- buffering around a point you select.



# SELECT POINTS (MCPD OR GCDB) BY DRAWING A POLYGON

Map Search

Select control point data:  
 MCPD  GCDB

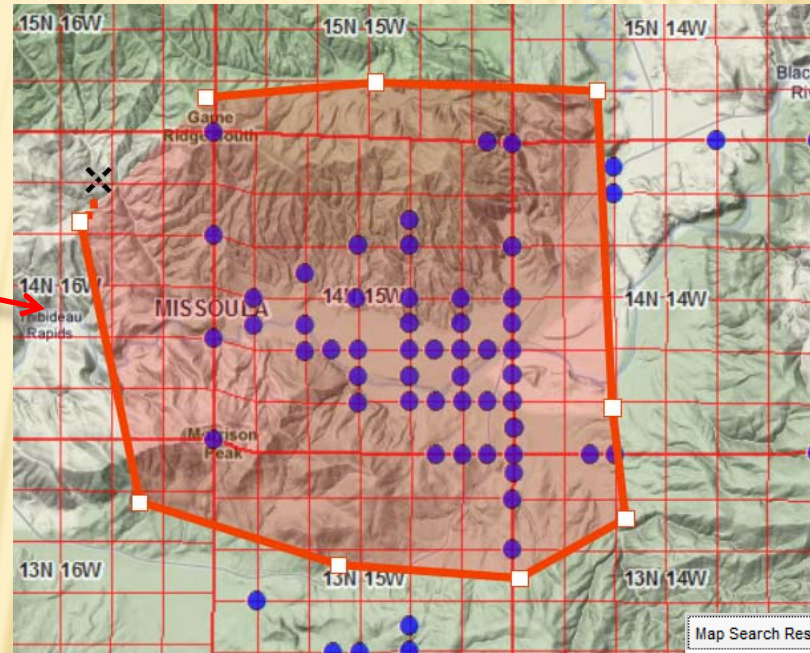
Create search area by:

drawing a polygon on the map, OR

buffering a point by radius of:  Miles

Select download file type:  
 ASCII  KML  Calculate & include lat/long coordinates  
 Decimal Degrees  
 Degrees Minutes Seconds

Create Search Area Close



Map Search Results

[63 control points found](#)  
(Right-click to "save-as")

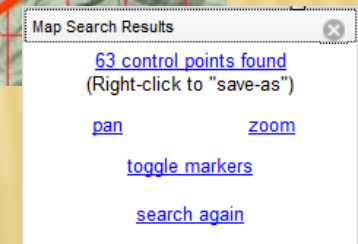
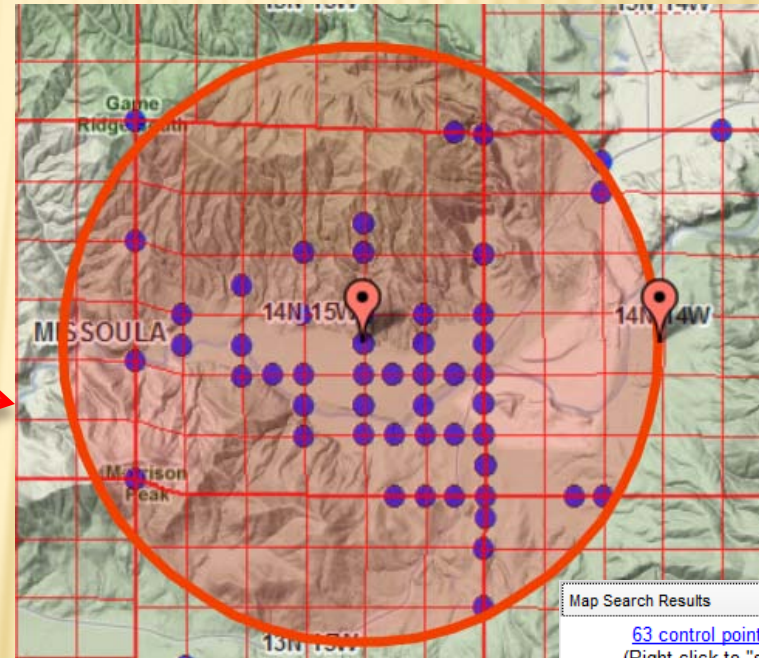
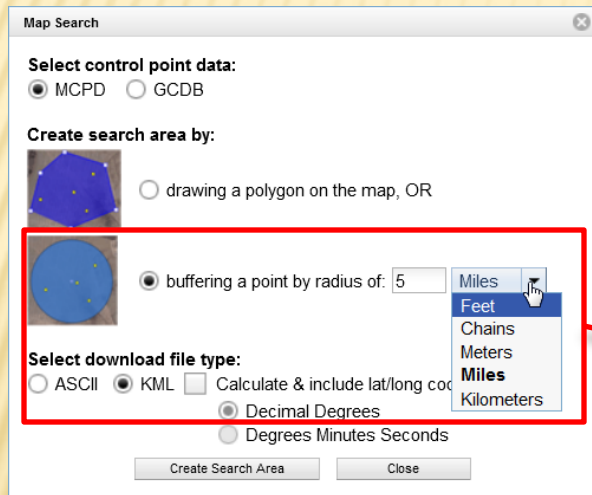
[pan](#) [zoom](#)

[toggle markers](#)

[search again](#)



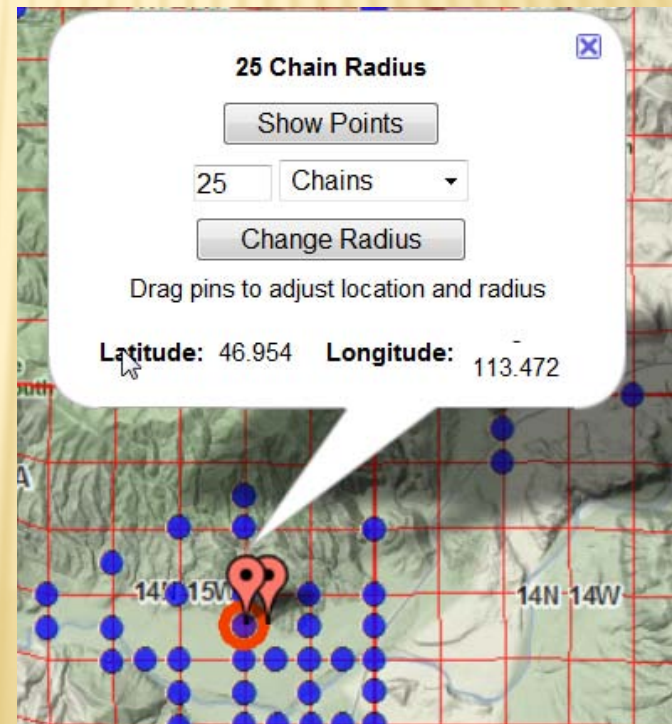
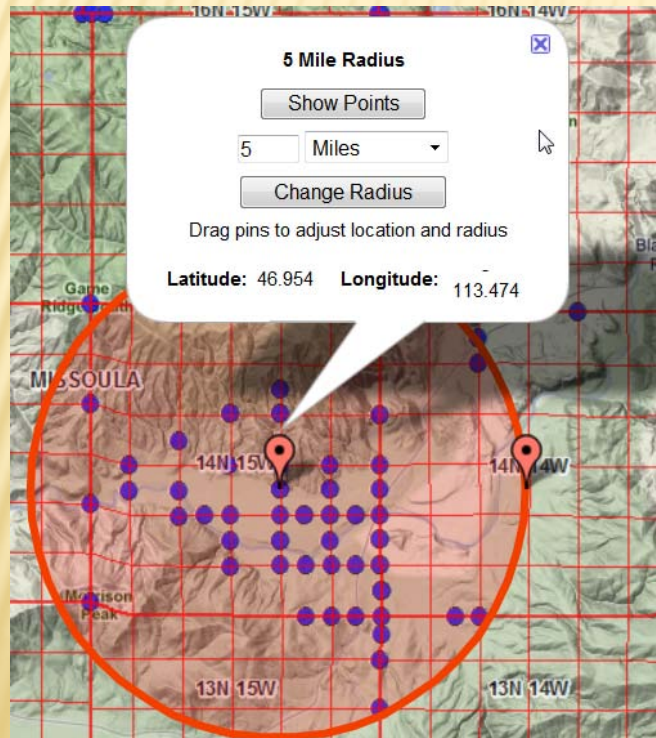
# SELECT POINTS (MCPD OR GCDB) BY DRAWING A BUFFER AROUND A POINT



# POINTS SELECTED BY BUFFER

After the MCPD draws the buffer and selects the point, you may modify the buffer changing the radius.

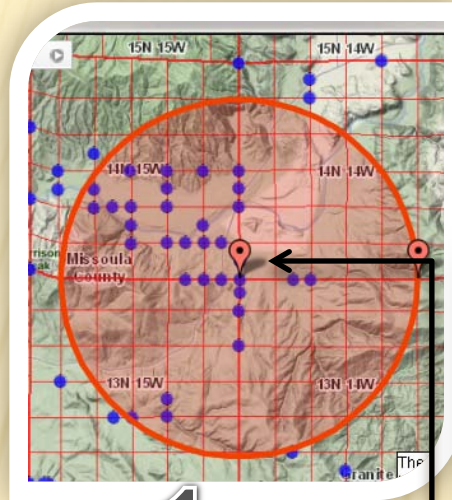
In this example the radius units were changed from *miles* to *chains*:



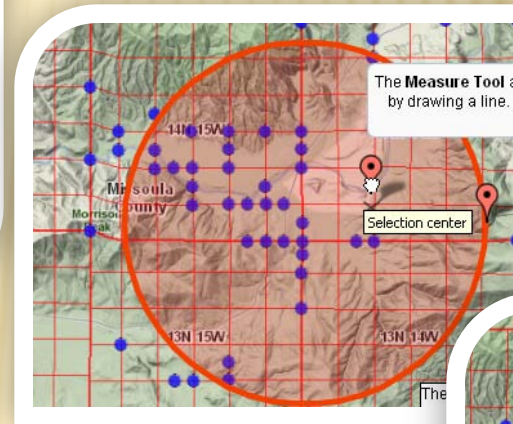


# CHANGE THE BUFFER RADIUS

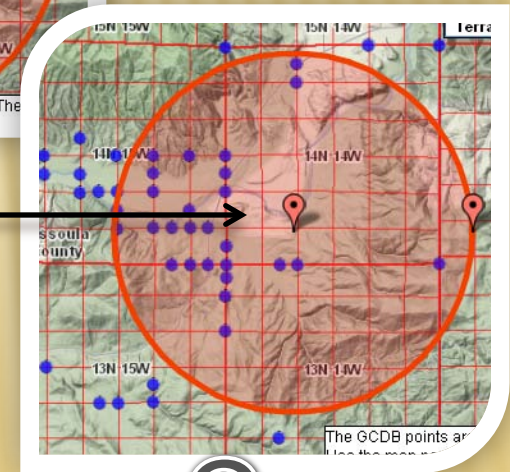
You may change the center of the buffer or the size of the buffer by interactively clicking on the buffer points on the map then moving them.



1.



2.



3.

# MISC MAP TOOLS

▼ MCPD

Database Search

Map Search

Measure Tool

Clear Map

Print Map

Street View

Show Tooltips

Control Points

MCPD ⓘ

GCDB ⓘ

NGS ⓘ

Surveyor Login ▼

[Excel Template](#) - [Help](#)

Useful Map Tools

# MEASURE TOOL

---

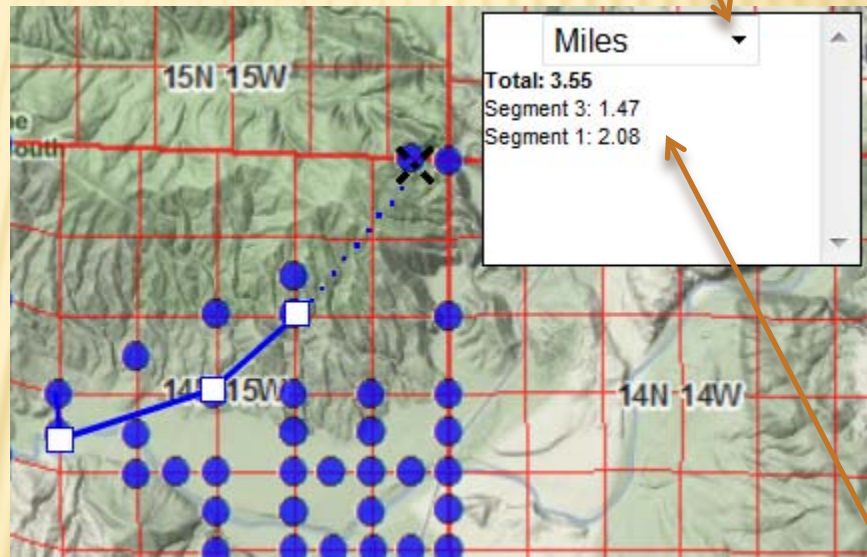


# THE MEASURE TOOL USE

Use the Measure Tool To measure distances on the map.

1. Click a location on the map with the mouse.
2. Move the mouse to another location, then click again.
3. Continue until the last point, then double-click the last point.

*You may change the measurement units by picking an option from the drop down list. All segments lengths are immediately updated to the new units.*



*The segment & total lengths are calculated after each click.*

Useful Map Tools

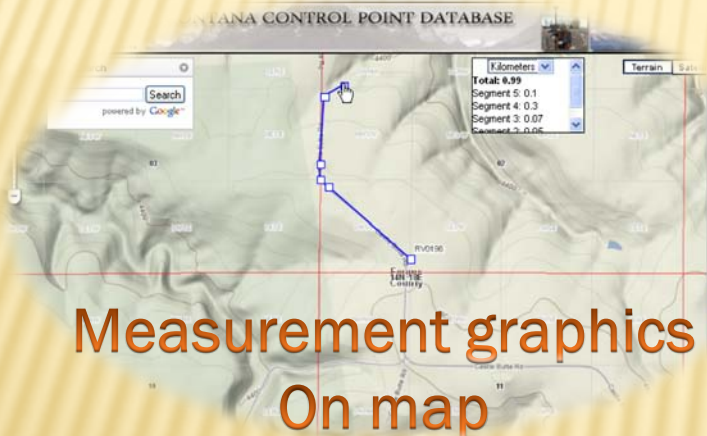
# CLEAR MAP TOOL

---

# ABOUT THE CLEAR MAP TOOL

The Clear Map tool will clear the map display of any user information, graphics, and selections such as:

- ✓ Measurement lines
- ✓ Selection buffers or polygon
- ✓ Information balloons, etc.



To clear the map, simple click on the Clear Map tool



Useful Map tools

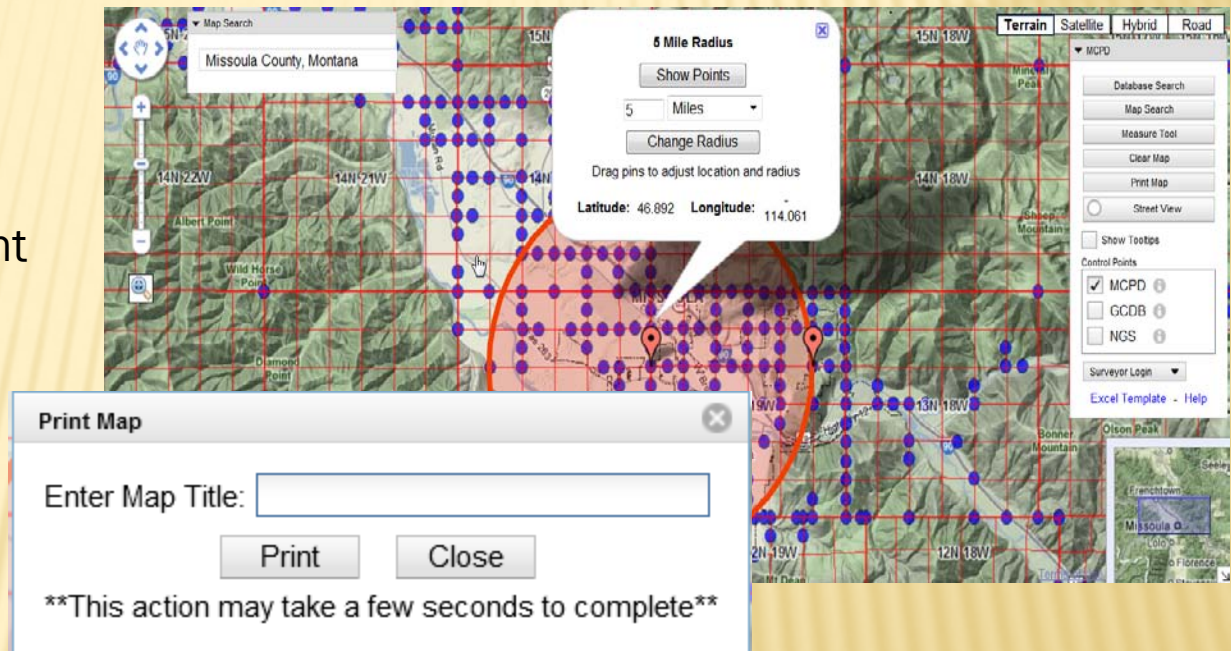
# PRINT MAP TOOL

---

# PRINT MAP TOOL

The Print Map tool is designed to provide hard copy output of the present map display.

A map title can be customized on-the-fly.



*The map will be rendered from the map display area only.*

Viewing the map

# **STREET VIEW TOOL**

---



# HOW TO USE THE STREET VIEW TOOL

The Street View application is separate from the MCPD, but is inserted into the MCPD viewer window.

NGS point RX0017  
Set in the stone wall of the city-county bldg



Only the streets that are outlined in blue have Street View photography.

# ABOUT THE STREET VIEW TOOL



The Street View tool starts the Google Street View™ application in a popup window. Street View photography is *not* available for all areas.

MCPD

# CONTRIBUTING DATA

---



# HOW TO CONTRIBUTE DATA

▼ MCPD

Database Search

Map Search

Measure Tool

Clear Map

Print Map

Street View

Show Tooltips

Control Points

MCPD ⓘ

GCDB ⓘ

NGS ⓘ

~~Surveyor Login~~

[Excel Template](#) - [Help](#)

# DOWNLOAD THE SPREADSHEET

The screenshot displays three overlapping windows. On the left is a web browser window titled 'Multi-state Control Point Database' with a search bar and a map of Idaho. In the center is a Microsoft Excel spreadsheet titled 'MCPD\_MASTER\_TEMPLATE.xls'. The spreadsheet has the following data:

Domain	Description	PointTypeClass
8. CapType	Steel	
9. CapType	None	
10. CoordinateSystem	Geographic	
11. CoordinateSystem	Idaho State Plane East Meters	
12. CoordinateSystem	Idaho State Plane East US Feet	
13. CoordinateSystem	Idaho State Plane Central Meters	
14. CoordinateSystem	Idaho State Plane Central US Feet	
15. CoordinateSystem	Idaho State Plane West Meters	
16. CoordinateSystem	Idaho State Plane West US Feet	
17. CoordinateSystem	Idaho Single Zone	
18. CoordinateSystem	Montana State Plane Meters	
19. CoordinateSystem	Montana State Plane Intl Feet	
20. CoordinateSystem	Montana State Plane US Feet	
21. CoordinateSystem	UTM Zone 11N	
22. CoordinateSystem	UTM Zone 12N	
23. CoordinateSystem	UTM Zone 18N	
24. HorizontalAccuracyConvention	Local Horizontal Accuracy	
25. HorizontalAccuracyConvention	Network Horizontal Accuracy	
26. HorizontalDatum	NAD83 (1986)	
27. HorizontalDatum	NAD83 (1992)	
28. HorizontalDatum	NAD83 (1999)	
29. HorizontalDatum	NAD83 (2007)	
30. HorizontalDatum	NAD83 (COR596)	
31. HorizontalDatum	WGS84	
32. HorizontalMethod	Recreation Grade GPS	
33. HorizontalMethod	Resource Grade GPS	
34. HorizontalMethod	Geodetic GPS	
35. HorizontalMethod	Real-Time Kinematic	
36. HorizontalMethod	Static GPS	
37. HorizontalMethod	Traverse	
38. HorizontalMethod	Triangulation	
39. HorizontalMethod	Trilateration	
40. HorizontalMethod	OPUS	
41. HorizontalMethod	Scaled	

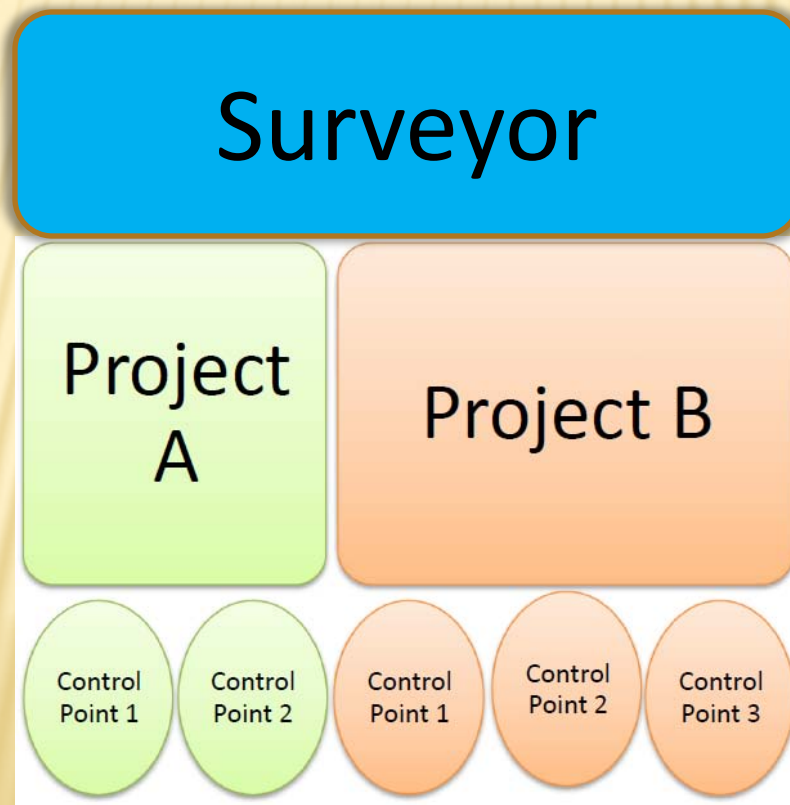
On the right is a map application window showing a map of Idaho with various control points marked. The map application has a toolbar with options like 'Terrain', 'Satellite', 'Hybrid', and 'Road', and a sidebar with 'Database Search', 'Map Search', 'Measure Tool', 'Clear Map', 'Print Map', and 'Street View'.

1. Select Excel Template
2. It will open in a new window
3. Save the document to your computer

# CONTRIBUTE DATA TO MCPD

## MCPD Project Paradigm

- Projects belong to a surveyor
- MCPD point records belong to a project



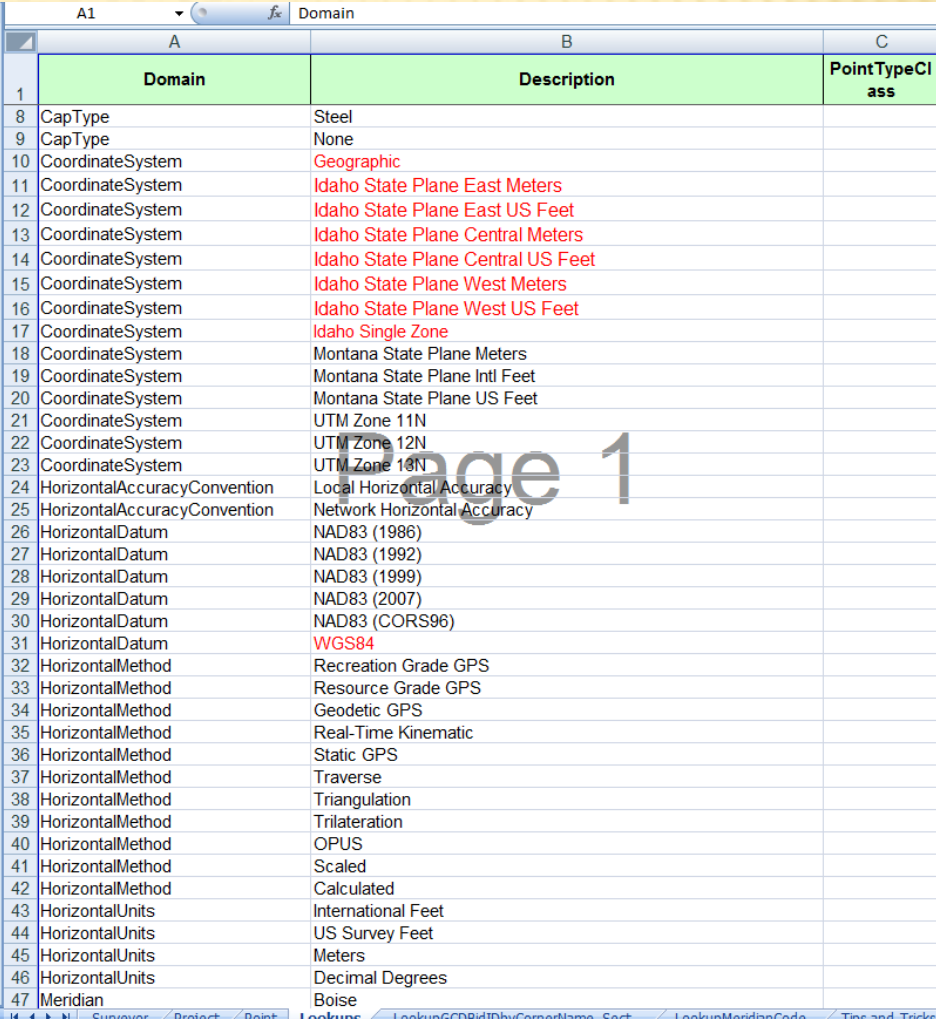


# SPREADSHEET DETAILS

Open the spreadsheet

Notice that the **Lookups** tab is Selected. You can not edit this tab.

Select the **Surveyor** tab.



	A	B	C
1	Domain	Description	PointTypeClass
8	CapType	Steel	
9	CapType	None	
10	CoordinateSystem	Geographic	
11	CoordinateSystem	Idaho State Plane East Meters	
12	CoordinateSystem	Idaho State Plane East US Feet	
13	CoordinateSystem	Idaho State Plane Central Meters	
14	CoordinateSystem	Idaho State Plane Central US Feet	
15	CoordinateSystem	Idaho State Plane West Meters	
16	CoordinateSystem	Idaho State Plane West US Feet	
17	CoordinateSystem	Idaho Single Zone	
18	CoordinateSystem	Montana State Plane Meters	
19	CoordinateSystem	Montana State Plane Intl Feet	
20	CoordinateSystem	Montana State Plane US Feet	
21	CoordinateSystem	UTM Zone 11N	
22	CoordinateSystem	UTM Zone 12N	
23	CoordinateSystem	UTM Zone 13N	
24	HorizontalAccuracyConvention	Local Horizontal Accuracy	
25	HorizontalAccuracyConvention	Network Horizontal Accuracy	
26	HorizontalDatum	NAD83 (1986)	
27	HorizontalDatum	NAD83 (1992)	
28	HorizontalDatum	NAD83 (1999)	
29	HorizontalDatum	NAD83 (2007)	
30	HorizontalDatum	NAD83 (CORS96)	
31	HorizontalDatum	WGS84	
32	HorizontalMethod	Recreation Grade GPS	
33	HorizontalMethod	Resource Grade GPS	
34	HorizontalMethod	Geodetic GPS	
35	HorizontalMethod	Real-Time Kinematic	
36	HorizontalMethod	Static GPS	
37	HorizontalMethod	Traverse	
38	HorizontalMethod	Triangulation	
39	HorizontalMethod	Trilateration	
40	HorizontalMethod	OPUS	
41	HorizontalMethod	Scaled	
42	HorizontalMethod	Calculated	
43	HorizontalUnits	International Feet	
44	HorizontalUnits	US Survey Feet	
45	HorizontalUnits	Meters	
46	HorizontalUnits	Decimal Degrees	
47	Meridian	Boise	

Page 1

# SURVEYOR TAB

	A	B	C	D	E	F	G	H	I	J	K
1	<u>Surveyor First Name</u>	<u>Surveyor Last Name</u>	<u>License Number</u>	<u>Phone</u>	Business Name	<u>Address 1</u>	Address 2	<u>City</u>	<u>State</u>	<u>Zip</u>	<u>Email</u>
2	Sample	Surveyor	999999	012-345-6789	Sample Engineering & Land Surveying	99999 North Last Chance Gulch Drive East	Suite 111	Survey City	MT	####	BobPlumb@nowhereonline.com
3											

**Note:**

1. Please enter only one project per spreadsheet.
2. The required worksheet columns are listed in **RED, BOLD, and are UNDERLINED.**
3. If the project contains elevation data additional worksheet columns are required and are listed in **BLUE, BOLD, ITALIC and are UNDERLINED.**
4. Fields listed as black are optional.
5. The first line (row 2) on each sheet shows an example.
6. The Lookups page should not be edited.

4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											
26											
27											
28											

TemplateRevisionDate 11.03.2011

# PROJECT TAB

	A	B	C	D	E	F	G	H	I
1	<u>Project Name</u>	<u>Project ID</u>	<u>Project Date</u>	<u>Project Coordinate System</u>	<u>Horizontal Datum</u>	EpochDate	<u>Vertical Datum</u>	Comments	
2	Sample Project Data	1	4/11/2007	Montana State Plane Meters	NAD83 (1986)		NAVD88	SAMPLE DATA USE THE LINE BELOW FOR DATA ENTRY	
3									

**Note:**

- Please enter only one project per spreadsheet.
- The required worksheet columns are listed in **RED**.
- If the project contains elevation data additional words **Vertical** and **Horizontal** are required. **Vertical** is **BLUE, BOLD, ITALIC** and are **UNDERLINED**.
- Fields listed as black are optional.
- The first line (row 2) on each sheet shows an example.
- The Lookups page should not be edited.

	C	D	E
	<u>Project Date</u>	<u>Project Coordinate System</u>	<u>Horizontal Datum</u>
	4/11/2007	Montana State Plane Meters	NAD83 (1986)

Geographic

- Idaho State Plane East Meters
- Idaho State Plane East US Feet
- Idaho State Plane Central Meters
- Idaho State Plane Central US Feet
- Idaho State Plane West Meters
- Idaho State Plane West US Feet
- Idaho Single Zone

A project can only have 1000 points  
 Every project must have the same coordinate system





# PICK LISTS

The screenshot shows a software interface with a top bar containing the letter 'L'. Below it, a green box contains the text 'Horizontal Method' in red, underlined font. Below this, a grey bar contains the text 'uracy' and 'Geodetic GPS' with a dropdown arrow. A list of surveying methods is displayed below, with 'Triangulation' highlighted in blue.

uracy	Geodetic GPS
	Recreation Grade GPS
	Resource Grade GPS
	Geodetic GPS
	Real-Time Kinematic
	Static GPS
	Traverse
	<b>Triangulation</b>
	Trilateration

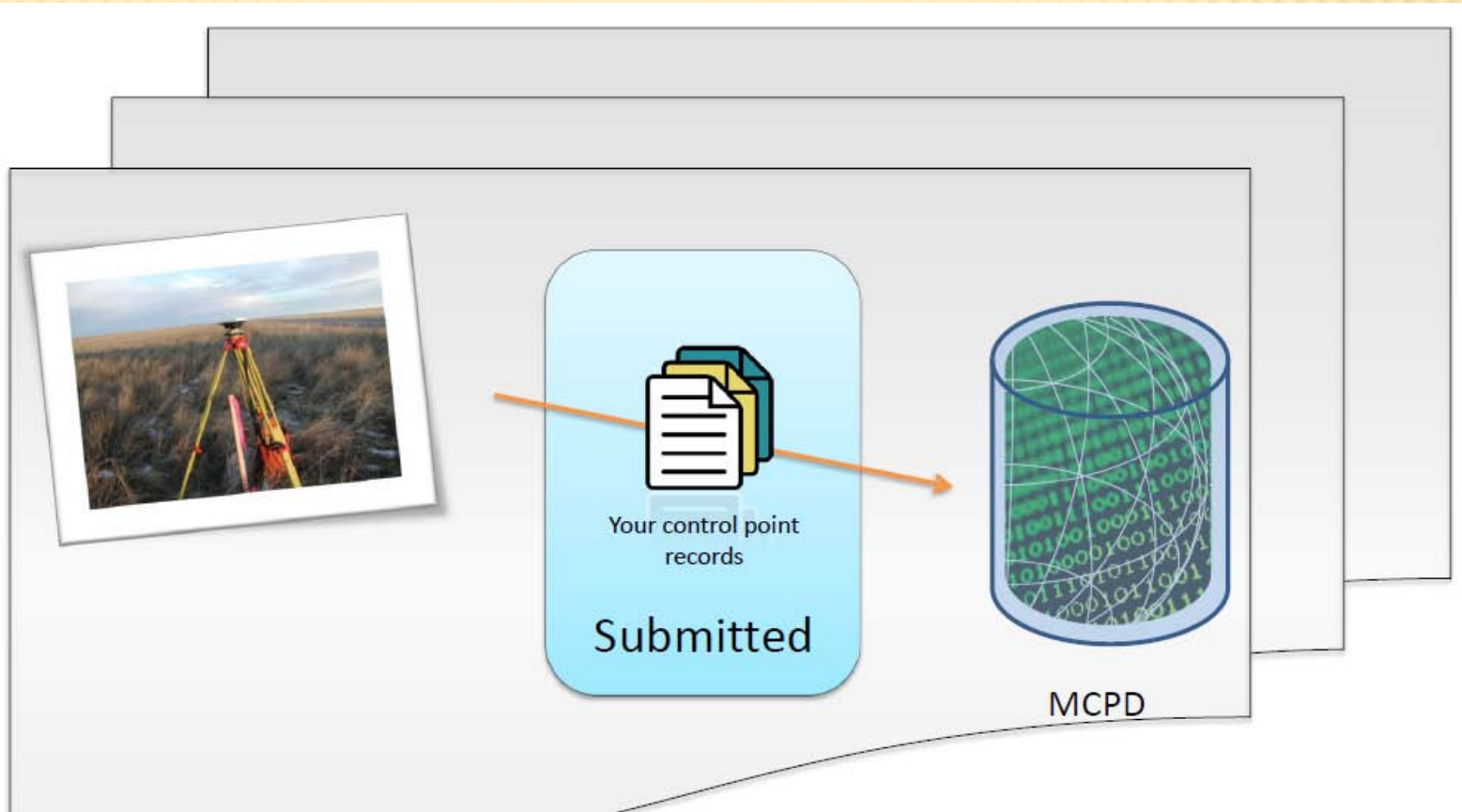
The screenshot shows a software interface with a top bar containing the letter 'R'. Below it, a green box contains the text 'Vertical Method' in blue, underlined font. Below this, a grey bar contains the text 'uracy' and 'GPS and Geoid Model' with a dropdown arrow. A list of surveying methods is displayed below, with 'Scaled' highlighted in blue.

uracy	GPS and Geoid Model
	GPS and Geoid Model 1996
	GPS and Geoid Model 1999
	GPS and Geoid Model 2003
	GPS and Geoid Model 2009
	Differential Leveling
	Trigonometric Leveling
	VERTCON
	<b>Scaled</b>





# HOW TO SUBMIT DATA





# PARTICIPATING ORGANIZATIONS

- *Professional land surveyors of Montana*
- *The Montana Association of Registered Land Surveyors*
- *Montana Department of Transportation*
- *Montana Department of Administration – Base Map Service Center*
- *National Geodetic Survey*
- *United States Forest Service*
- *United States Bureau of Land Management*
- *Missoula County, Montana*
- *Lewis & Clark County, Montana*
- *Professional land surveyors of Idaho*
- *Idaho Society of Professional Land Surveyors*
- *The Idaho Map – TIM*
- *Information Technology Resource Management Council of Idaho*
- *Idaho Department of Transportation*
- *Federal Geographic Data Committee*
- *United States Geological Survey*



# REFERENCES AND CONTACTS

---

The business plan

<http://giscenter.isu.edu/research/Techpg/capGC/index.htm>

Donna Pitzer, Reclamation

[dpitzer@usbr.gov](mailto:dpitzer@usbr.gov)

Rodney Burch, PLS

Dioptrageomatics.com

[rodney@dioptrageomatics.com](mailto:rodney@dioptrageomatics.com)

Questions?