



MAP NEWS

Internal Newsletter of the Multinational Andean Project

<http://www.pma-map.com/newsletter/v3n10.html>

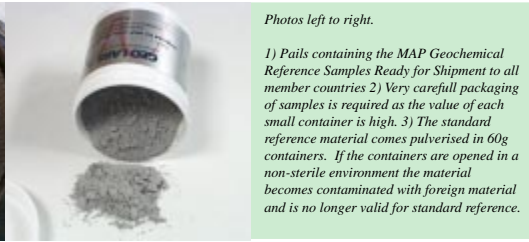
Vancouver, BC, January 1st, 2001

A Monthly Update of Internal Project News

Vol 3 - No. 10

Happy New Year! ~ ¡Feliz Año Nuevo!

The Map management team wishes to extend it's best wishes for the new millennium.



Photos left to right.

1) Pails containing the MAP Geochemical Reference Samples Ready for Shipment to all member countries 2) Very carefull packaging of samples is required as the value of each small container is high. 3) The standard reference material comes pulverised in 60g containers. If the containers are opened in a non-sterile environment the material becomes contaminated with foreign material and is no longer valid for standard reference.

MAP Geochemical Standards Distributed

Production is complete for three Geochemical Reference Materials custom-made for the Multinational Andean Project from rock samples collected from locations in three MAP countries, by a specialized process at the Ontario Ministry of Northern Mines and Development Geoscience Laboratories in Canada. Each country will receive over one hundred 60 g bottles of homogenized rock powder from each sample, including the preliminary set of CHA-2 samples distributed in August 2000 at the MAP Executive Council meeting in Chile. Standard samples (geochemical reference materials) completed are: Andesite from near active volcano Lascar in Chile (CHA-2); Basalt from Petrified Forest Natural Monument [del Parque Nacional "Monumento Natural Bosques Petrificados"] in Argentina (BAMAP01); and Rhyolite from Moquegua, Peru (PER-1). Each sample comes complete with a report detailing the geoanalytical process and giving the standard compositions for whole rock major and trace elements from a statistical number of analyses, with standard deviations. This information will also be summarised in an updated poster for the Cordilleran Roundup in Vancouver in January.

Chile is in the process of selecting another suitable andesite of more mafic composition, and Bolivia has selected a dacitic rock to be made into geochemical reference material, pending collection of sufficient sample material. This will bring the total number of new Andean geochemical reference materials to five (5), a significant scientific contribution of the MAP project to South American geological research.

Cordilleran Roundup

MAP will be participating in the 2001 Cordilleran Roundup (January 23 to 26) in Vancouver. The MAP management team in Vancouver will be presenting posters on MAP products and general activities at the poster sessions. Posters will cover the following:

- MAP History
- MAP Metallogenic map
- MAP Samples Database
- MAP Sample Standards
- MAP Airborne Geophysics

The Cordilleran Roundup is generally equally well attended by mining industry representatives from Canada and the US as well as by the government geoscience community. It has also proven to be a good venue for public display of MAP products and activities. This year a special session entitled "Exploration in Peru" on Friday, January 26 will be attended by: Mr. Carlos Herrera - Minister of Energy and Mines for Peru; Mr. Humberto Montes - Vice Minister of Mines for Peru; Mr. Jorge Merino - President/CEPRI Centromin, Peru, and from Canada, the Assistant Deputy Minister for Natural Resources Canada, Mineral Policy Sector Dr. Richard Haworth will be in attendance.

The tenth meeting of the MAP Executive Council

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Council will take place in Toronto, Canada during the week of the Prospectors and Developers Association of Canada (PDAC) Convention (March 11 to 14, 2001). MAP management would like to request all participating countries to forward names of attendees from their country to the meetings to Mr. Mike Ellerbeck - mellerbeck@nrcan.gc.ca before January 30, 2001. Hotel reservations have been made and meeting rooms booked. The Metallogenic map meeting will take place in the morning of Tuesday the 13th to be followed by the MAP Samples Database meeting in the afternoon. The Executive council meeting is scheduled to start Wednesday the 14th, 8:30 - 12:00PM and Thursday 8:30 - 5:30PM followed by a closing dinner. Members are also requested to send suggestions for agenda topics to Mr. Ellerbeck.

New Peruvian Minister

MAP management is pleased to welcome Mr. Carlos Herrera as the newly appointed Minister of Mines and Energy for Peru as well as Mr. Humberto Montes as the new Vice-Minister of Mines for Peru. Both the Minister and Vice Minister will be in Vancouver to attend the Cordilleran Roundup and the special "Exploration in Peru" session.

Coordinate Parameters Needed for MAP Database

The MAP database, MAPdb, is in its final stages of development and further data entry has re-started, but it is rapidly becoming clear that a potential problem is developing with station and sample locations. We still lack much location information, but the most important information missing is the projection for each country's coordinate system.

Most geologists are accustomed to working within their own country and many choose to use the local coordinate grid, which is most commonly UTM (Universal Transverse Mercator) or TM (Transverse Mercator) coordinates. This is becoming particularly common with the development of more

accurate handheld GPS units. Unfortunately, these local coordinates tend to be slightly, but significantly, different from country to country. Typically, each country's surveying department sets parameters for their grid, including a reference ellipsoid for the earth's shape, a distortion scale factor and offset of the origin (false northing and easting), to optimize for the country's shape and location. This is one reason why the metallogenic map uses only geographic coordinates, hence avoiding most differences in local grids across borders. Unfortunately, this problem cannot be avoided for samples with locations given only in local grid coordinates. In this case, it is necessary that each country provide us with the projection parameters for their local coordinate system, as shown in Figure 1, so the coordinates can be converted

standard conversion (for GPS work). But this put the Chilean samples in the northern hemisphere ! The reason was that this particular standard conversion has a UTM north coordinate counting from zero at the equator, and is negative in the southern hemisphere. Surveyors in South America, probably many years ago, decided quite sensibly that it wasn't practical to always write large negative numbers, so they shifted the UTM grid origin about ten thousand kilometers south; this false northing of 10,000,000 meters south, along with a false easting of 500,000 meters, forms part of a second standard conversion. We applied this second conversion, and this time found differences between the calculated locations and those provided by Chile of about 40 meters. This seems acceptable at first. But the projection equations used in the conversion have millimetric accuracy, sufficient for

Argentinian maps use the Campo Inchauspe 1969 Datum, which in turn uses either the International 1924 ellipsoid, or the International 1967 ellipsoid, but we aren't sure which. The real problem that we want to avoid is incorrectly converting critically important sample locations, and then plotting them in the wrong place on a map. The simplest way to resolve these problems is for us to turn to you for help.

The projection parameters can usually be obtained from departments of land surveying or geodesy. Figure 1 shows the four parameters we require: **(1) Ellipsoid**. This is the approximate earth shape used by the projection. The current standard globally is GRS80 or equivalently WGS 1984, although many countries use other ellipsoids. We need to know which ellipsoid you use, and what its shape parameters are: semi-major and semi-minor axes lengths in meters, or one axis and the eccentricity, or one axis and the inverse flattening. If you only know the ellipsoid's name, we can probably find the parameters (we have the shape parameters for: GRS80, WGS72, International 1924 and 1967, Clarke 1880 and 1866, Airy, and Bessel). **(2) Type of projection**, UTM or TM (Transverse Mercator). Some countries do not use UTM projections at all, so if you are one of these, please let us know which you do use to get local grid coordinates. The projection names themselves can lead to confusion, for example in North America we call it the TM (Transverse Mercator) projection, while many other regions call it the Gauss-Kruger projection. Simply knowing the name should allow us to get it right. **(3) Scale factor at the origin**. This is a stretching factor that gets the UTM grid to better represent the earth's surface. It's normally a number in the range 0.9995-0.9999. **(4) False northing and false easting**. These are the offsets of the origin of the UTM grid. For South America it's likely that the False northing will be 10 million meters south, and the false easting is often 500,000 m, but we need these confirmed.

Please let us know as soon as possible ! Send the information to Mark Stasiuk (mstasiuk@nrcan.gc.ca).

Correction

In the December issue of MAP NEWS we wished everyone Happy Holidays and Felices Pascuas in Spanish - the correct Spanish should have been Felices Fiestas. We apologize for any confusion.

The screenshot shows a web-based form for entering projection parameters. At the top, there are input fields for 'Country' and 'Station'. Below this is a 'New Settings...' dialog box with the following fields:

- new set name:** Chile ?
- comment:** this is an approximate projection for Chile
- ellipsoid:** A dropdown menu with options: wgs84 (selected), wgs72, Clarke1866, and Clarke1880.
- projection:** A dropdown menu with options: UTM (Universal Transverse Mercator) and TM (Transverse Mercator).
- scale factor:** 9996153
- false northing:** -10,000,000
- false easting:** 500,000

Figure 1: Screen shot of database layout for adding a new set of projections parameters for conversion between local grid and geographic coordinates.

to latitude and longitude and vice versa.

Here is an example of the sort of problems that can arise, which are not at all intuitively obvious but can become very awkward. Chile recently provided us with an excellent list of sample information for entry in the database. All their samples came with locations. Some samples had locations in both lat./long. and UTM, others had only one or the other type of coordinate. Those with both types gave us the opportunity to test the conversion between lat./long. and UTM, which could then be applied to the other samples with only one coordinate type. We applied one

geodetic-type (tectonic and ground deformation) GPS measurements, when their parameters are correct. This meant that the second conversion we used was not right either. Our next step was to use the Chilean data to calculate new projection parameters (shown in the figure) which convert lat./long. locations to UTM to within 6 meters of the UTMs that Chile provided. This is better, but the parameters are still not correct. It is likely that we are using the wrong earth shape (ellipsoid), or scale factor. Argentina has also provided locations in both systems, but we haven't calculated the approximate Argentinian projection yet and suspect similar difficulties will arise. For example,

For further MAP information please consult the project Web page at:

<http://www.pma-map.com>

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