Request for Site Questionnaire and Background Document
CryoNet South America Workshop, First Session
Santiago de Chile, 27-29 October 2014

MARIANO H. MASIOKAS, IANIGLA, CCT CONICET Mendoza

A. Background Document

Please create a short document that describes your measurement and/or research program. Details of the site can be provided in the site questionnaire (described below). Please include the following:

- Short description of the site or program

On October 28th, 2010, the Argentinean Senate approved the National Law 26639 entitled "Presupuestos Mínimos para la Preservación de los Glaciares y del Ambiente Periglacial" (Minimum Standards for the Preservation of Glaciers and Periglacial Environments). This National law establishes the protection of all glaciers and periglacial features as strategic reserves of frozen water and declares these reverses as public goods. The Law also creates the National Glacier Inventory (NGI) to identify and map all the glacier and periglacial landforms that act as strategic water reserves in the Argentinean Andes. The NGI will record and collect all necessary information for the proper protection, control and monitoring of cryoforms with hydrological significance. The inventory is the responsibility of the Argentinean Institute for Snow, Ice and Environmental Research (IANIGLA) in collaboration with the National Ministry of Environment.

The NGI is organized in three levels: Level 1 includes the identification, mapping and characterization of all glaciers and cryoforms that act as hydrological resources in the country. Level 2 includes the assessment of recent fluctuations of selected glaciated areas along the Argentinean Andes. Level 3 consists of detailed mass-balance, meteorological and hydrological studies in selected glaciers in different regions of the country.

As part of Level 3 of the NGI, we started a program to monitor the mass balance and hydro-meteorological variations of carefully selected glaciers in the Desert and the Central Andes and also in the North and South Patagonian Andes of Argentina. Complete AWS were installed in 2014 besides Glaciar de los Tres (49°S) and also near the glaciers of Monte Tronador (41°S) in the South and North Patagonian Andes, respectively. Another complete AWS will be installed near a small glacier in Laguna del Diamante in the Central Andes (34°S) and near Glaciar Agua Negra in the Desert Andes (30°S). The data from all these new AWS will be complemented with data from existing stations located at lower elevations in the vicinity of the study sites. Permanent gauging stations will also be installed at the selected glaciers to measure the hydrological contribution of these ice masses to stream runoff.

- Who sponsors your measurements (a national agency, a university, private company)

The NGI is mostly supported by the Federal Government but has been complemented with funds from other existing projects with similar or related research objectives.

- What national or international networks you are already part of, if any

A IANIGLA member (Dr Pierre Pitte) is the National Correspondent of the World Glacier Monitoring Service (WGMS). Our Institute is also part of the GLIMS (Global Land Ice from Space) project as Regional Center 27. This project has allowed access to satellite imagery for the development of glacier inventories along the Andes.

- Which components of the cryosphere you measure (snow, glaciers, sea ice, etc.)

Presently at the study sites mentioned above the measurements are focused on the mass balance of the glaciers. Snow accumulation and other relevant meteorological variables are (or will be) also measured at the AWS installed at these sites in the Andes. For all these areas the inventory of glaciers is completed or near completion. In these inventories each glacier was mapped and a series of basic and detailed parameters (area, elevation range, orientation, length, etc) were derived from the glacier outlines and digital elevation models.

- Outlook for your site: will it be sustained for the long-term or is it a short-term site?

The National Law 26639 established a long-term program for inventorying and monitoring the ice masses that act as strategic water reserves for the country. Therefore, the glaciological and hydro-meteorological measurements we have recently started should be continued in the long-term.

It would be helpful if you could also address the following questions:

1. How could CryoNet help meet your national, regional or global interests?

- Support for the installation of additional sensors and for the remote access of data.
-Technical support for setting up the available stations, calibration of instruments, etc.
-Discussion and guidance on specific complex issues such as the proper measurement of snow at high elevation sites.

2. What could you or your organization contribute to the implementation of CryoNet?

-As briefly described above, we are implementing a new network of high elevation AWS and gauging stations in combination with mass balance measurements at selected sites along the Argentinean Andes. This network could contribute to increase the

number of AWS from high elevation sites and fulfil the objectives of our mutual research and data collection programs.

3. What do you see as the benefits of CryoNet: (e.g. for operational and research network operators, scientific and decision/policy making community, environmental monitoring and modelling, scientists, satellite data providers, etc.)?

Being part of Cryonet could increase the visibility, applicability and overall reliability of the meteorological data that we will collect as part of our ongoing research projects at IANIGLA. It would also allow us to participate of forums, workshops and meetings that are essential for discussing the many complex technical, scientific, and political issues related to the collection of meteorological records at high, mountainous remote sites in the Andes.

4. What do you see as existing gaps in cryospheric observations (e.g. thematic, spatial, temporal, availability, exchange, data policy, etc.) and how might CryoNet address these?

The serious lack of long, complete and reliable glacier mass balance and meteorological records in the southern Andes is probably the clearest example of the limited amount of information currently available in this vast, high elevation region. This lack of information constitutes one key limitation to fully understand, for example, the response of these ice masses to ongoing changes in climate.

By promoting the establishment of a well coordinated network of meteorological and cryospheric measurements along the Andes, CryoNet could fill this serious gap of information and provide crucial data for the proper understanding not only of the relationship between Andean ice masses and climate variations, but also contribute in the study of the significance of glaciers as water resources in different sector of the Andes.

5. Please prioritize CryoNet activities according your personal view (indicate HIGH/MEDIUM/LOW for each):

Establishment of CryoNet network: HIGH
Standards, guidelines and training for observations: HIGH
Inter-comparison experiments (e.g. sensors, methods): HIGH
Cooperation with existing networks: HIGH
Data policy on archiving, accessibility and exchange: HIGH
Support national needs: HIGH

6. Please share any other thoughts for participants to consider at the meeting.

Excellent opportunity to get to know other scientists working on similar research topics and having similar interests, limitations and issues related to the collection of top quality glaciological, hydrological and meteorological records in our study sites in the Andes. Thank you very much for the opportunity to participate of this first CryoNet workshop!