On behalf of the CryoNet Team
### CryoNet STATIONS

- measures at least one variable of a cryosphere component (e.g. snow, permafrost, sea ice...)
  - has to fulfill CryoNet minimum requirements
  - must have ancillary meteorological measurements
  - has the target of long-term operation (primary) or long-term operational commitment with 10+ years record (reference)

*Potential attributes: primary, reference, cal/val, research*

### CryoNet SITES

- contain two or more coordinated stations (at least one is a CryoNet station) with varying capabilities that are coordinated as a local cluster
- must have a concept describing the research approach and the site management

*Potential attributes: basic, integrated*
Core activity: GCW Station Proposal Process

1. A representative of the station or site (hereafter, the “applicant” and the “station”) completes and submits the station questionnaire (the “application”) on the GCW website (globalcryospherewatch.org/cryonet/questionnaire).
   - It is recommended, though not required, that the applicant present the station at a GCW meeting before beginning the application process.
   - By submitting the application for a CryoNet station, the applicant is implicitly agreeing that the station meets the CryoNet Minimum Requirements. A commitment to longevity, data quality, and data distribution is particularly important.

2. CryoNet sites must also submit a site concept paper.

3. For stations that are operated by the WMO Member’s NHMS, the WMO Permanent Representative (PR) of the station’s operating country sends a letter of endorsement to WMO. For stations that are operated by other national entities, there must be a written agreement between that entity and the PR. For stations that are located in another country the agreement between the parties in these countries should be available for information. … (The Secretariat will revise this item.)

4. The application is examined by the WMO Secretariat for completeness.
5. The GCW CryoNet Team, in consultation with relevant experts, evaluates the application. This is normally done annually, but may be expedited in some situations. There are no site visits. Applicants may suggest relevant experts.

6. If the Team recommends that the station not be included in the GCW surface network, feedback is provided to the applicant. The application can be modified and resubmitted at any time.

7. If the Team recommends that the station be included in the network, the GCW Steering Group (GSG) makes its determination. This is normally done at GSG annual meetings. If the GSG recommends that the station not be included in the GCW surface network, feedback is provided to the applicant.

8. If the GSG recommends the station for inclusion in the network, the station is conditionally accepted and enters a one-year trial period. CryoNet stations and sites shall operate according to the Minimum Requirements.

9. If the GSG recommends the station for inclusion in the network, the final approval is made by the WMO Executive Council (EC). EC meets annually.
Minimum requirements of CryoNet Station

1. Meeting CryoNet Measurement Requirements
   The station shall measure at least one of the variables of one of the cryosphere components (i.e. snow, solid precipitation, lake and river ice, sea ice, glaciers, frozen ground and permafrost). The station location is chosen such that cryospheric measurements are representative of the surrounding region, and such representativeness needs to be clearly described.

2. Commitment of Operational Continuity
   The station must be active. The responsible agencies are committed, to the extent reasonable, to sustaining long-term observations of at least one cryosphere component. There must be a commitment to continue measurements for a minimum of four (4) years.

3. Metadata Up to Date and Availability
   The station metadata (including all needed metadata describing the station characteristics and observational programme information) are kept up-to-date and available in the GCW portal as the interface to the WIGOS Information Resource (WIR) and updated regularly.
4. **Compliance with Agreed Regulatory Practices**

The station observational procedures, the instruments and method of observations, quality control practices, etc., should follow GCW endorsed regulations, manuals, guides and to the extent possible the recommended best practices.

5. **Data and Ancillary Data freely available**

Make data freely available, whenever possible in near real time; In situ ancillary meteorological observations, as required in the CryoNet best practices, should also be available with documented quality.

6. **Competency of staff**

Personnel must be trained in the operation and maintenance of the station.
Cryospheric surface observations have complex structure
CryoNet stations and sites

CryoNet station ID Glacier
CryoNet station ID AWS
CryoNet station ID Snow measurement
CryoNet station ID ablation stake
CryoNet station ID GST test field
CryoNet station ID Discharge gauge
CryoNet station ID Stream ecology
CryoNet station ID Snow test field
CryoNet station ID atm. chemistry
CryoNet station ID Permafrost borehole
Cooperation and added value from other activities

**harmosnow**: A European network for a harmonized monitoring of snow for the benefit of climate change scenarios, hydrology and numerical weather prediction

**IASC**: call for cross-cutting issues: snow initiative "Cutting barriers in snow knowledge", led by Martin Schneebeli (ASSW 2015 GCW presentation)

**JPI CLIMATE WORKSHOP ON EUROPEAN LONG TERM OBSERVATION NETWORKS** 9-10 November 2015, PARIS (GCW-presentation)