CryoNet objectives and synthesis of participant questionnaire responses

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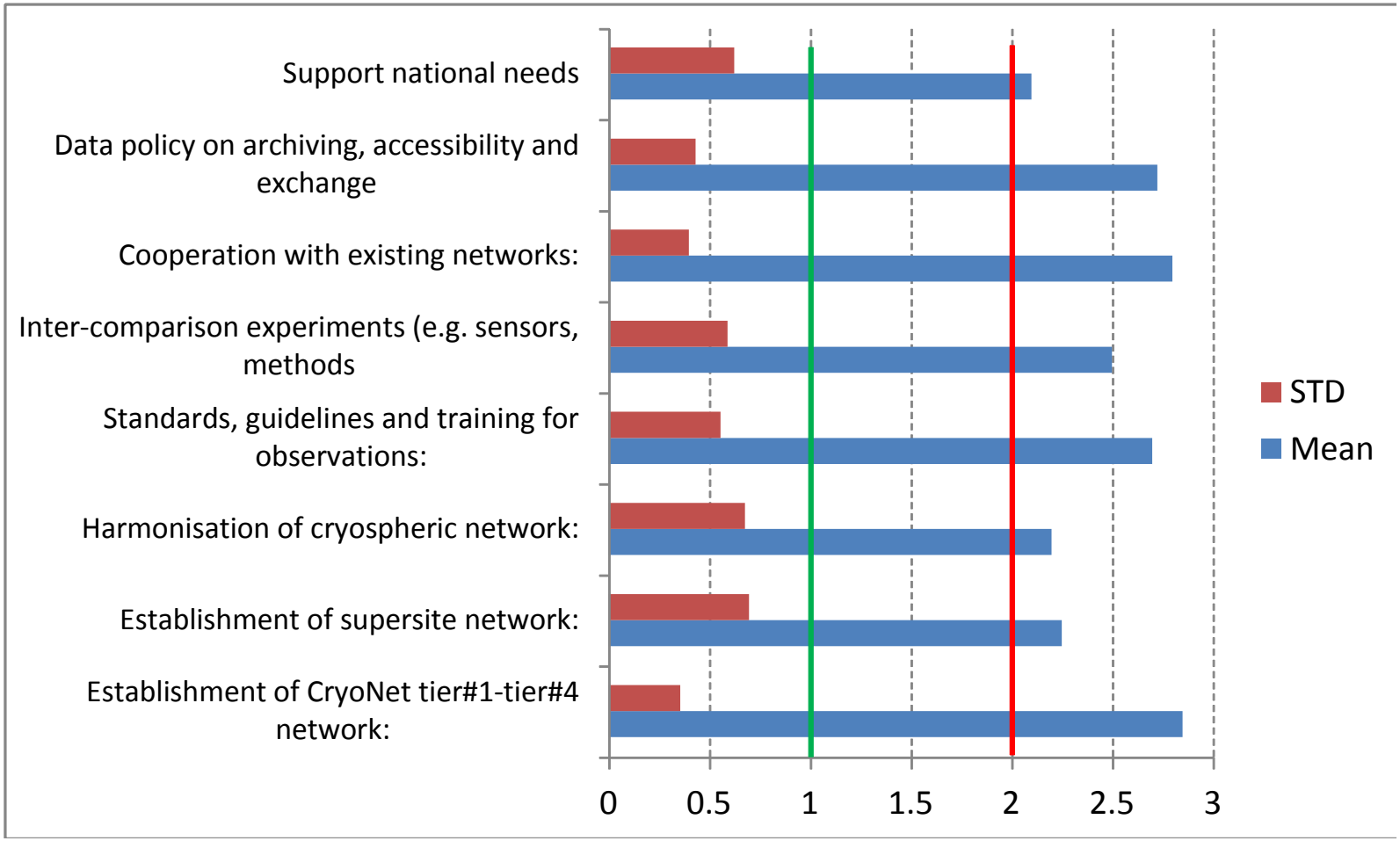
GCW
Global Cryosphere Watch

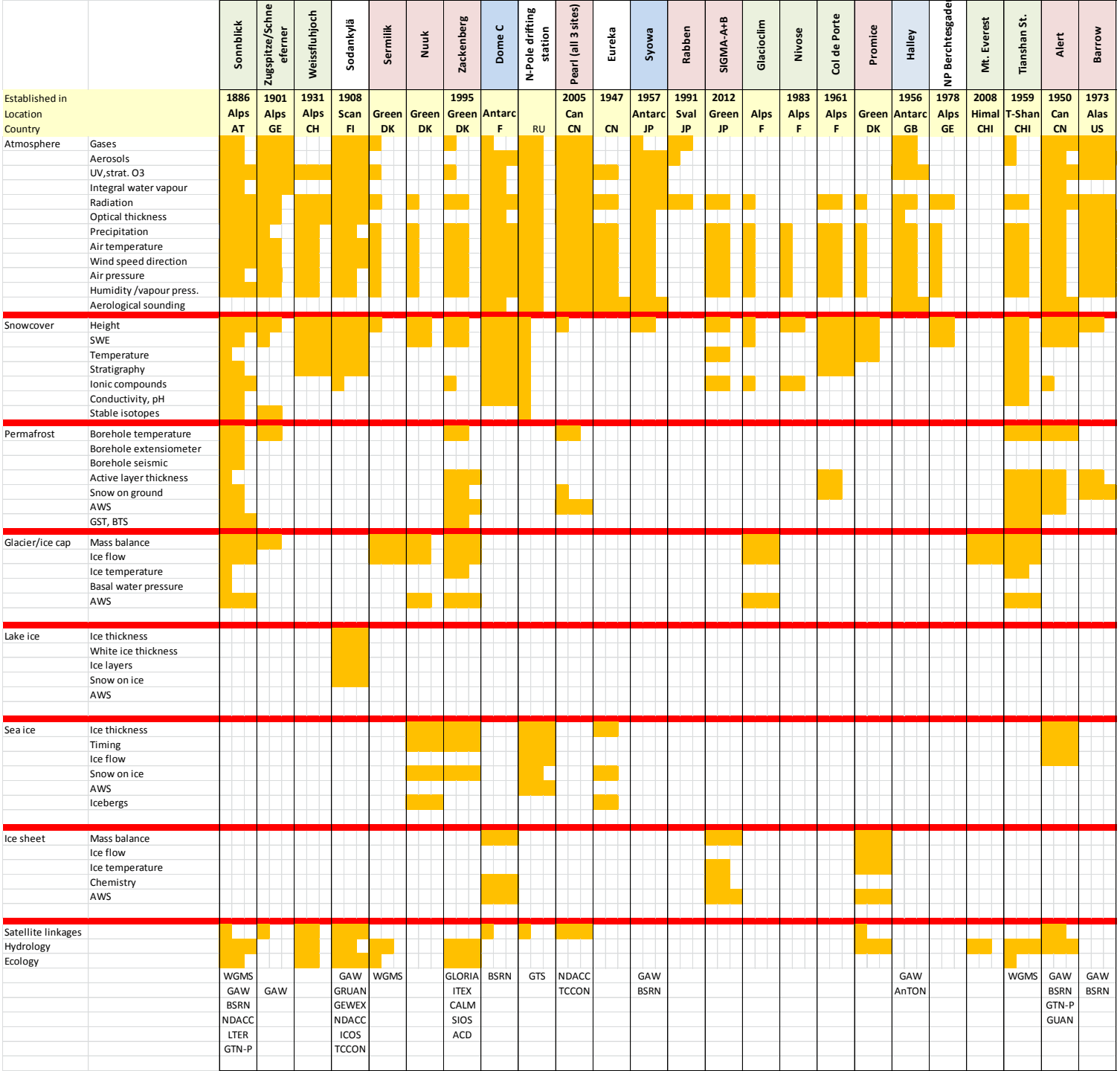
Objectives

- CryoNet, through long-term, sustainable observing and monitoring, will contribute to:

- 1) Quantification of changes in the cryosphere over a range of time and space scales
- 2) Quantification and understanding of the effects of climate change on cryosphere and vice-versa covering changes and underlying processes as well as feedbacks
- 3) Assessment of the impacts (interaction with??) of the cryosphere on other earth spheres, in particular the hydrosphere, the biosphere and the lithosphere
- 4) Verification of satellite data with in-situ measurements to enable modelling approaches for interpretation of satellite data and to extend the point information from CryoNet stations into the space domain
- 5) Standardized cryosphere observations for NWP and hydrologic model development and verification

Questionaire: general questions

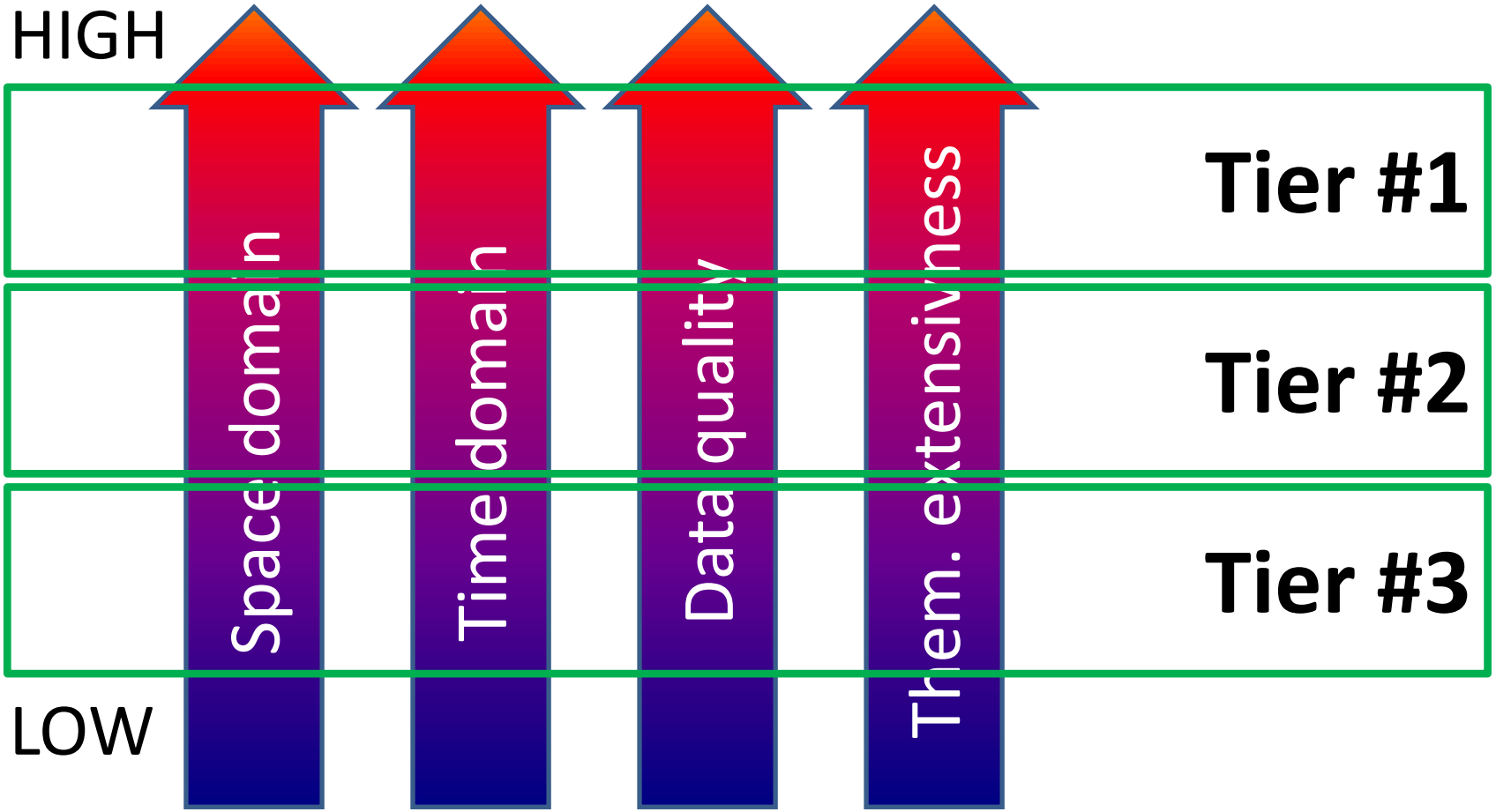



Sonnblick
Zugspitze/Schneefernerhaus
Weissfluhjoch
Sodankylä
Sermilik
Nuuk
Zackenberg
Dome C
N-Pole drifting station
Pearl (all 3 sites)
Eureka
Syowa
Rabben
SIGMA-A+B
Glacioclim
Nivose
Col de Porte
Promice
Halley
NP Berchtesgaden
Mt. Everest
Tianshan St.
Alert
Barrow
Established in 1886 1901 1931 1908 1995 2005 1947 1957 1991 2012 1983 1961 1956 1978 2008 1959 1950 1973
Location Alps Alps Alps Scan Green Green Green Antarc N-Pole Can Eureka Antarc Sval Green Alps Alps Alps Green Antarc Alps Himal T-Shan Can Alas
Country AT GE CH FI DK DK DK F RU CN CN JP JP JP F F F DK GB GE CHI CHI CN US
Atmosphere
Gases
Aerosols
UV,strat. O3
Integral water vapour
Radiation
Optical thickness
Precipitation
Air temperature
Wind speed direction
Air pressure
Humidity /vapour press.
Aerological sounding
Snowcover
Height
SWE
Temperature
Stratigraphy
Ionic compounds
Conductivity, pH
Stable isotopes
Permafrost
Borehole temperature
Borehole extensiometer
Borehole seismic
Active layer thickness
Snow on ground
AWS
GST, BTS
Glacier/ice cap
Mass balance
Ice flow
Ice temperature
Basal water pressure
AWS
Lake ice
Ice thickness
White ice thickness
Ice layers
Snow on ice
AWS
Sea ice
Ice thickness
Timing
Ice flow
Snow on ice
AWS
Icebergs
Ice sheet
Mass balance
Ice flow
Ice temperature
Chemistry
AWS
Satellite linkages
Hydrology
Ecology
WGMS WGMS GAW GLORIA BSRN GTS NDACC GAW GAW WGMS GAW GAW
GAW GAW GRUAN ITEX TCCON BSRN AnTON BSRN BSRN
BSRN GEWEX CALM GTN-P
NDACC NDACC SIOS GUAN
LTER ICOS ACD
GTN-P TCCON

Key messages from questionaire feedback

- Implementation of tiered network
- High need for standards and guidelines in cryospheric observations (many counts)
- Serve science and practitioners
- Cooperate with existing networks
- Fill gaps in existing networks
- Data policy and data provision

Reasons for a tiered network



Tier #1 CryoNET sites (tentative name SUPER-SITE)

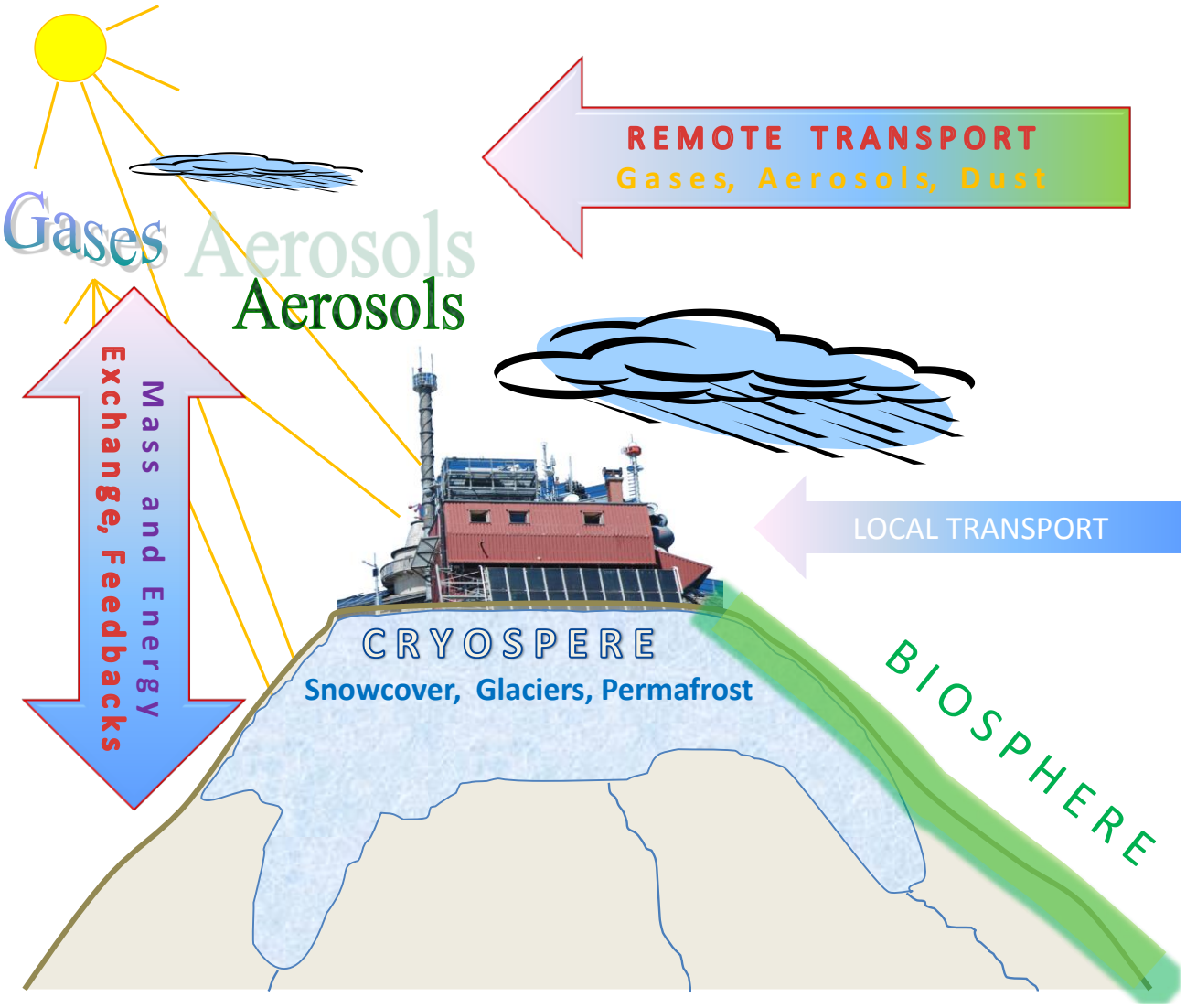
SUPER-SITE: = CryoNET station which monitors the physical and chemical properties of all components (GCW focal areas) of the local cryosphere in its full complexity and at the highest quality standards as well as the interaction of local/regional atmosphere.

Established linkages to satellite observations and to other disciplines such as hydrology, oceanography, ecology etc.).

In many cases these stations are supported by more than one research agency, have strong scientific supporting programme and provide facilities for intensive campaigns.

Super-sites are stations/observatories with on-site technical staff for maintaining the monitoring and scientific experiments.
Super-site is a “high-level label” of WMO-GCW for cryospheric observations similar as GAW global station.

Complexity of processes



Aims for tier #1 sites:

a) Monitoring of changes of the physical and chemical properties of the cryosphere with respect to changes of the atmosphere (climate) and including interactions between different components of the cryosphere
b) Linkage of ground truth with satellite observations (ground truth, calibration, merge both information …) in order to monitor the global cryosphere at high spatial and temporal scale
c) Estimation of the impact of changes of cryosphere on hydrology, water management, ecology, oceanography …
c) Extensive datasets for cryospheric modelling approaches (validation, calibration)
c) Training of personal for cryospheric observations
d) Extensive information to the public

Tier #2 CryoNET sites (tentative name REFERENCE-SITE)

- **REFERENCE-SITE**: (=Cryonet station monitoring at least 1 component of the cryosphere at the level of reference site of relevant network organisation as e.g. WGMS for glaciers, GTN-P for permafrost etc.)

Tier #3 CryoNET sites (tentative name OBSERVATION-SITE)

OBSERVATION-SITE: (=Cryonet station monitoring at least 1 component of the cryosphere at the level of accepted GCW standards)