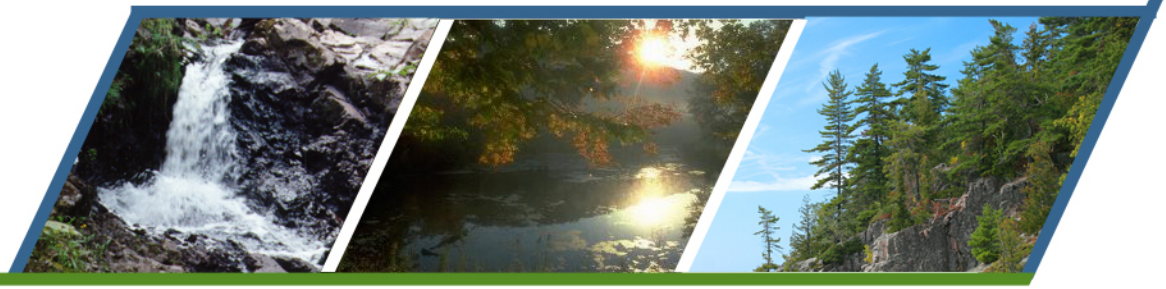
FERC Meeting, Washington, 1 March 2016



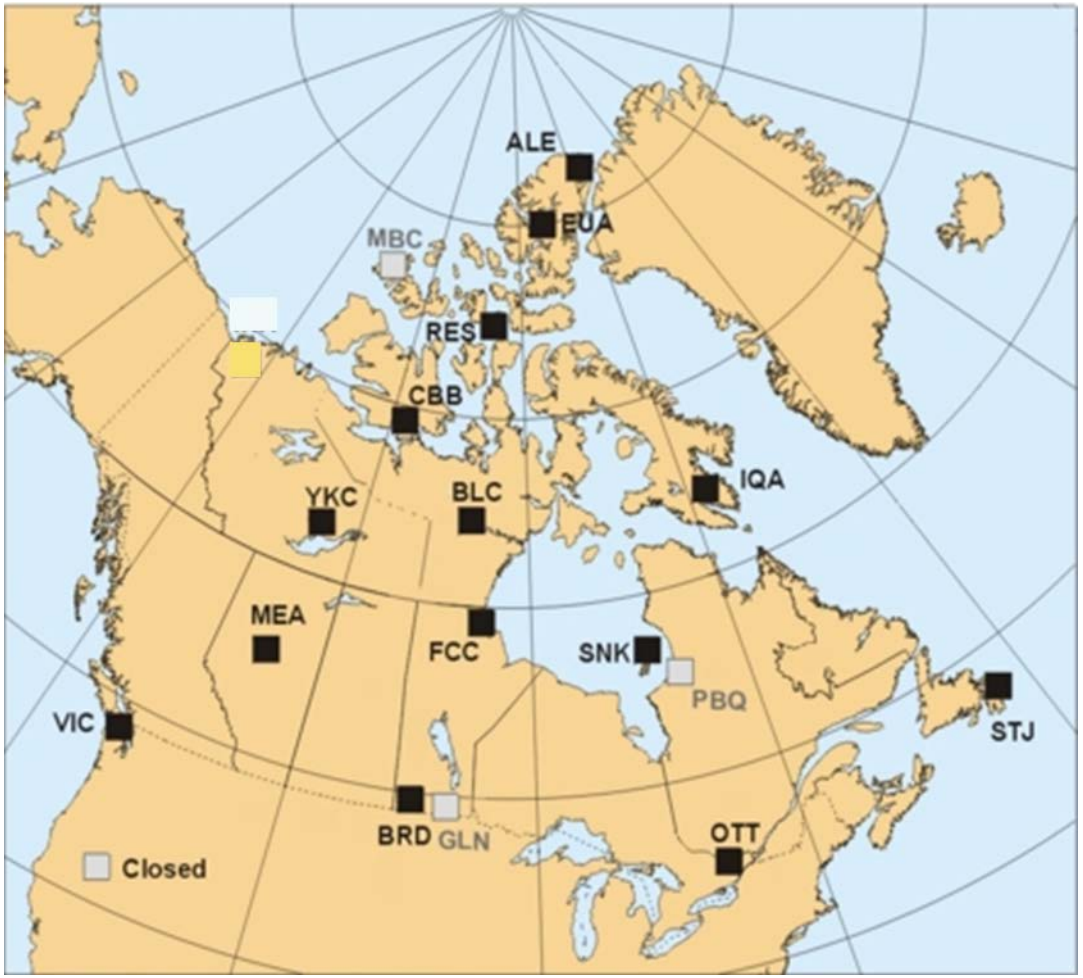
Canadian and International Geomagnetic Monitoring

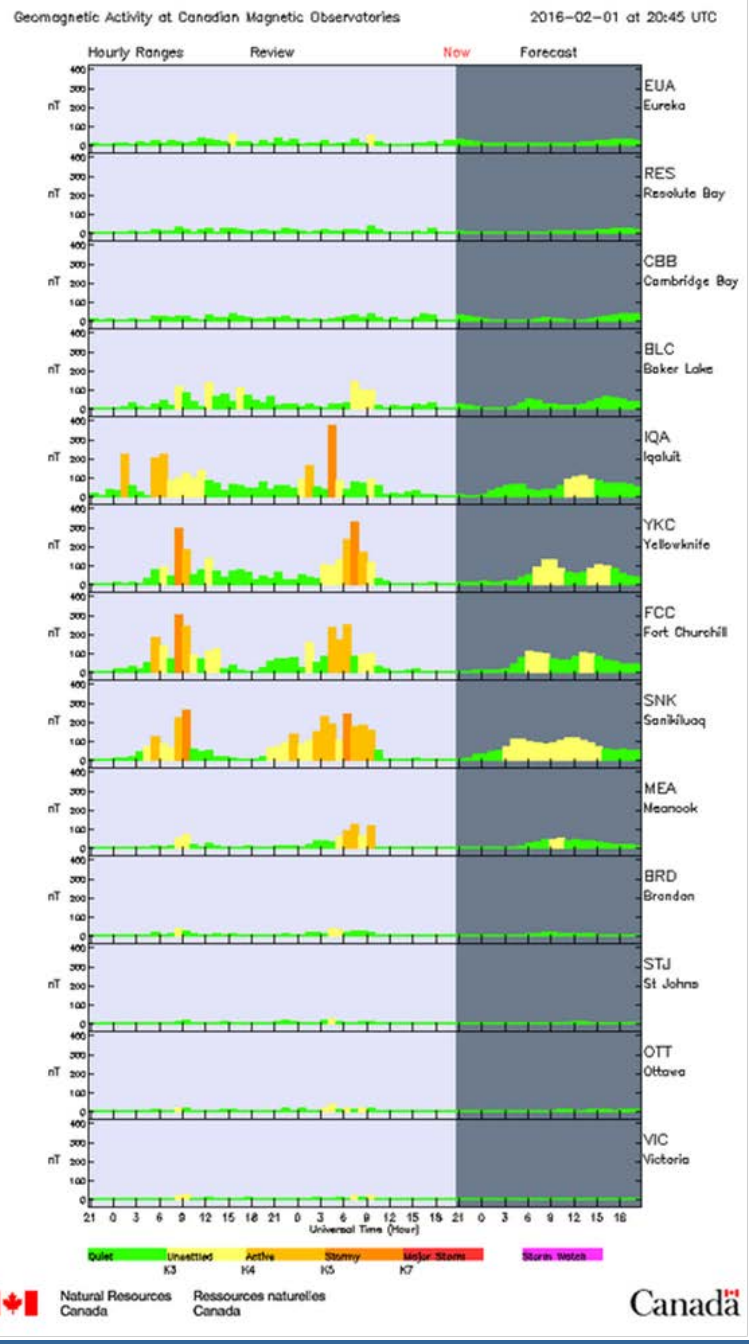
D. H. Boteler
Geomagnetic Laboratory, Ottawa

Natural Resources Canada | Ressources naturelles Canada

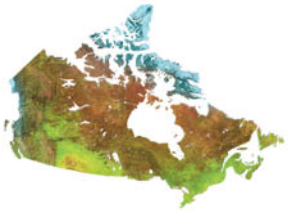
Canada

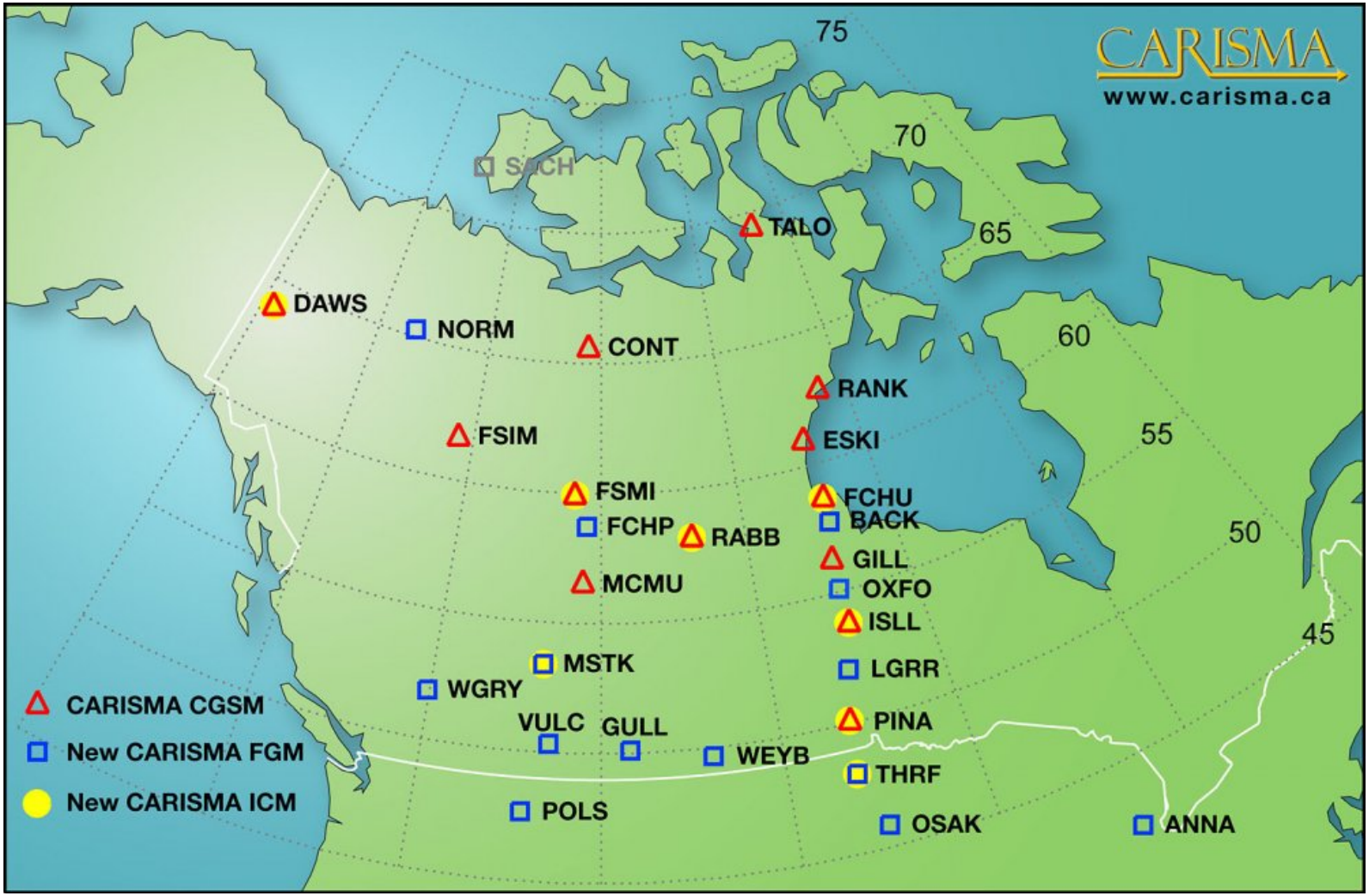
Magnetic Observatories



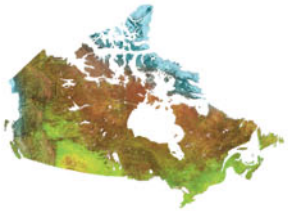


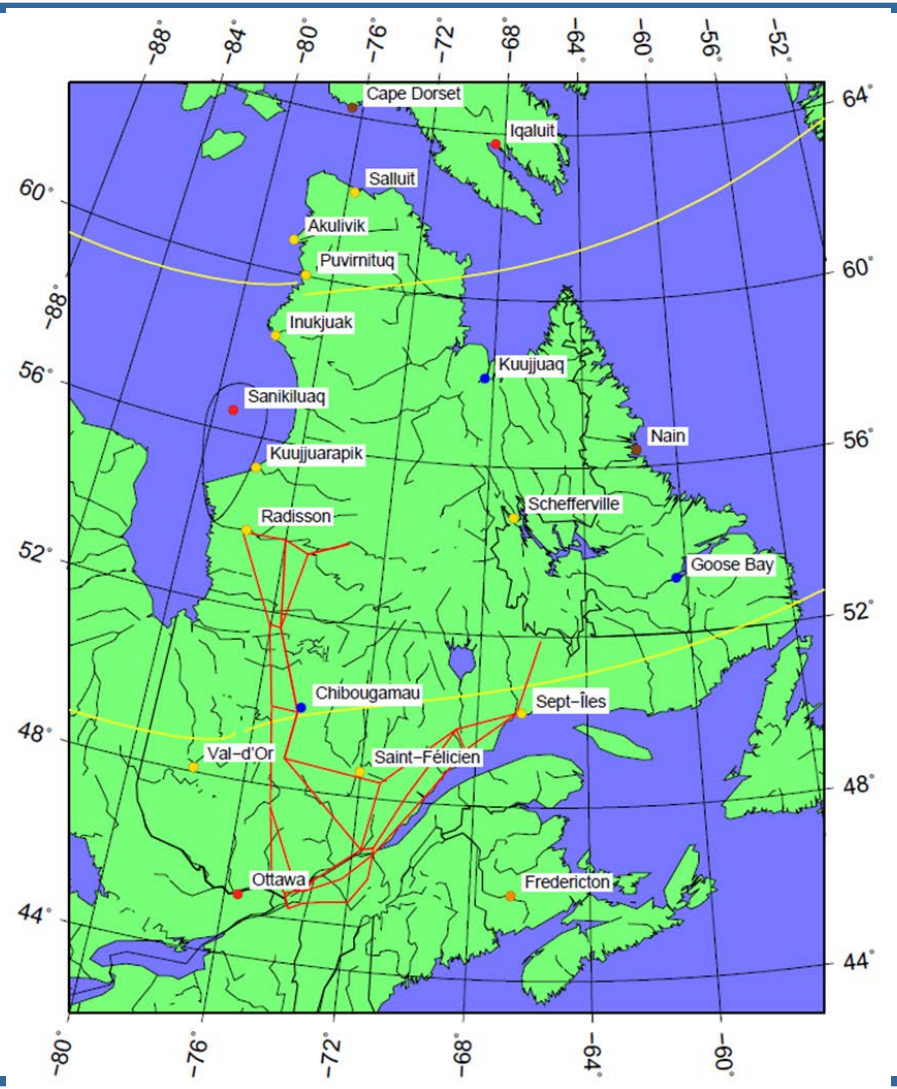
CARISMA network





AUTUMNX network





Run by U. Athabasca

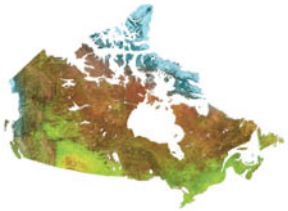
Supported by Canadian Space Agency

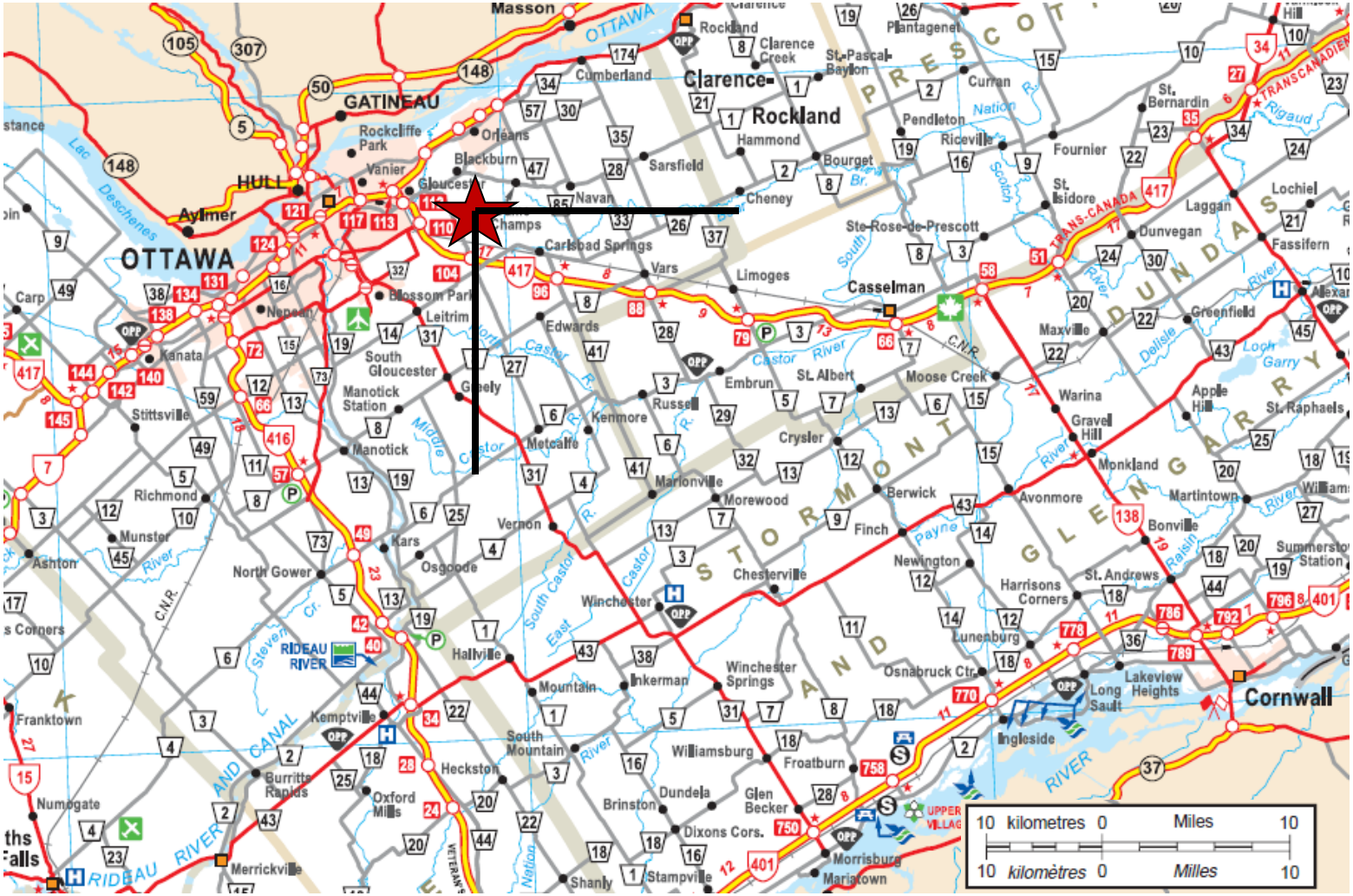
Installed late 2014

2Hz Sampling rate

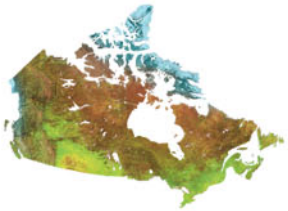
Other magnetometers being installed by power utilities

Geoelectric Field Measurements





Global Picture: INTERMAGNET



INTERMAGNET

INTERMAGNET | Data | Observatories (IMOs) | Participating Institutes | Publications/Softwares | How to Reach Us

- History
- Principles, Conditions, and Policies
- Organizational Structure
- Geomagnetic Information Nodes (GINs)
- Geomagnetic Activity Map
- FAQ

INTERMAGNET

*Int*ernational *R*eal-time *Mag*netic Observatory *Net*work

Welcome to **INTERMAGNET** - the global network of observatories, monitoring the Earth's magnetic field. At this site you can find data and information from geomagnetic observatories around the world.

The INTERMAGNET programme exists to establish a global network of cooperating digital magnetic observatories, adopting modern standard specifications for measuring and recording equipment, in order to facilitate data exchanges and the production of geomagnetic products in close to real time.

Where local support is lacking it is a further goal of INTERMAGNET to aid in the establishment of new observatories or to provide assistance with the upgrade and maintenance of existing facilities. Supplemental to this aim is the promotion of modern standards for measuring and recording the Earth's magnetic field. INTERMAGNET is constituted from existing groups whose primary task is one of geomagnetic measurement.

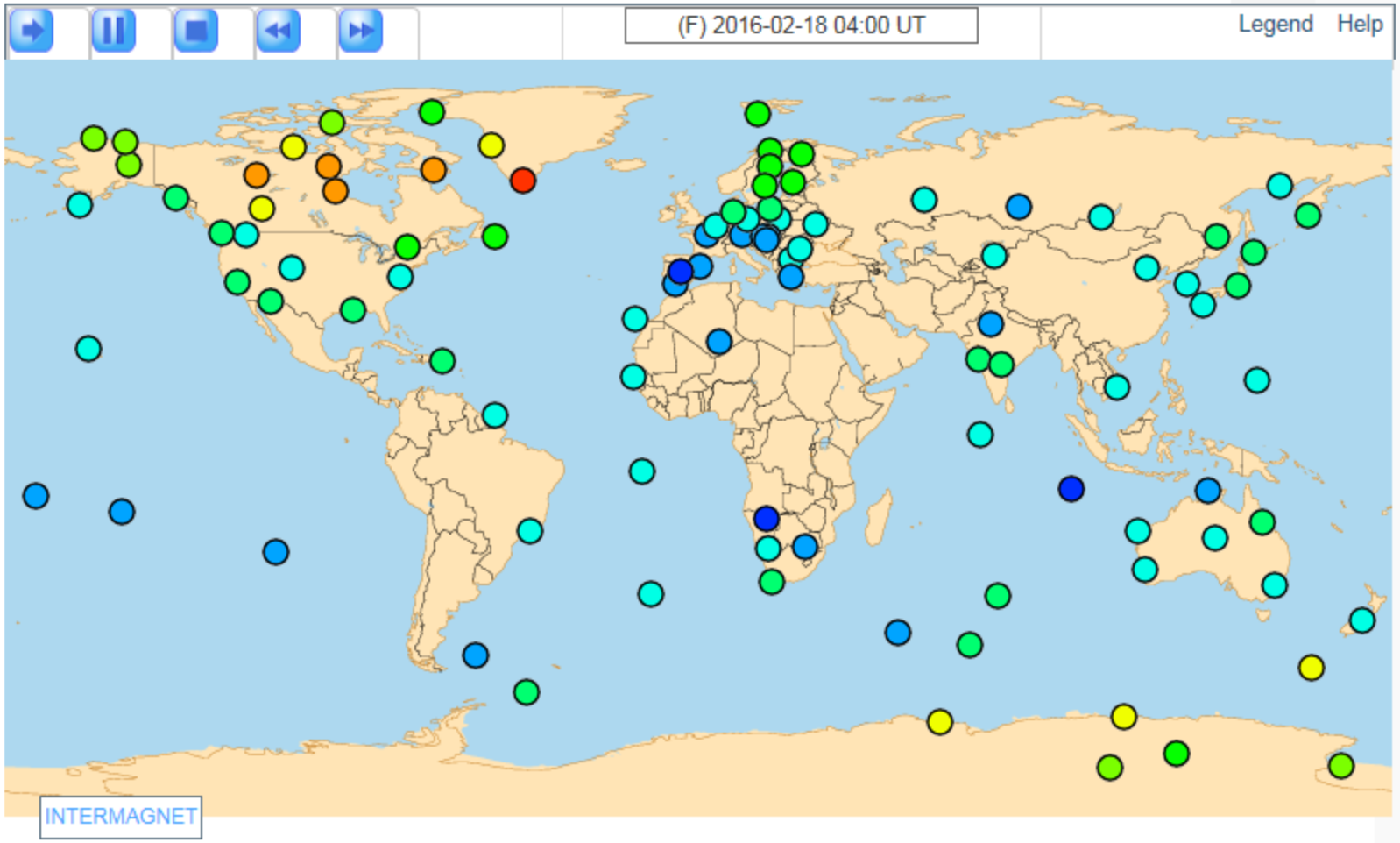
Member of:

ICSU WORLD DATA SYSTEM

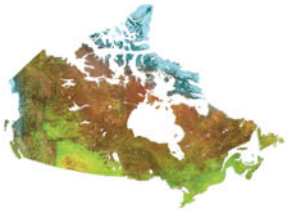
1-sec data is new standard for magnetic observatories

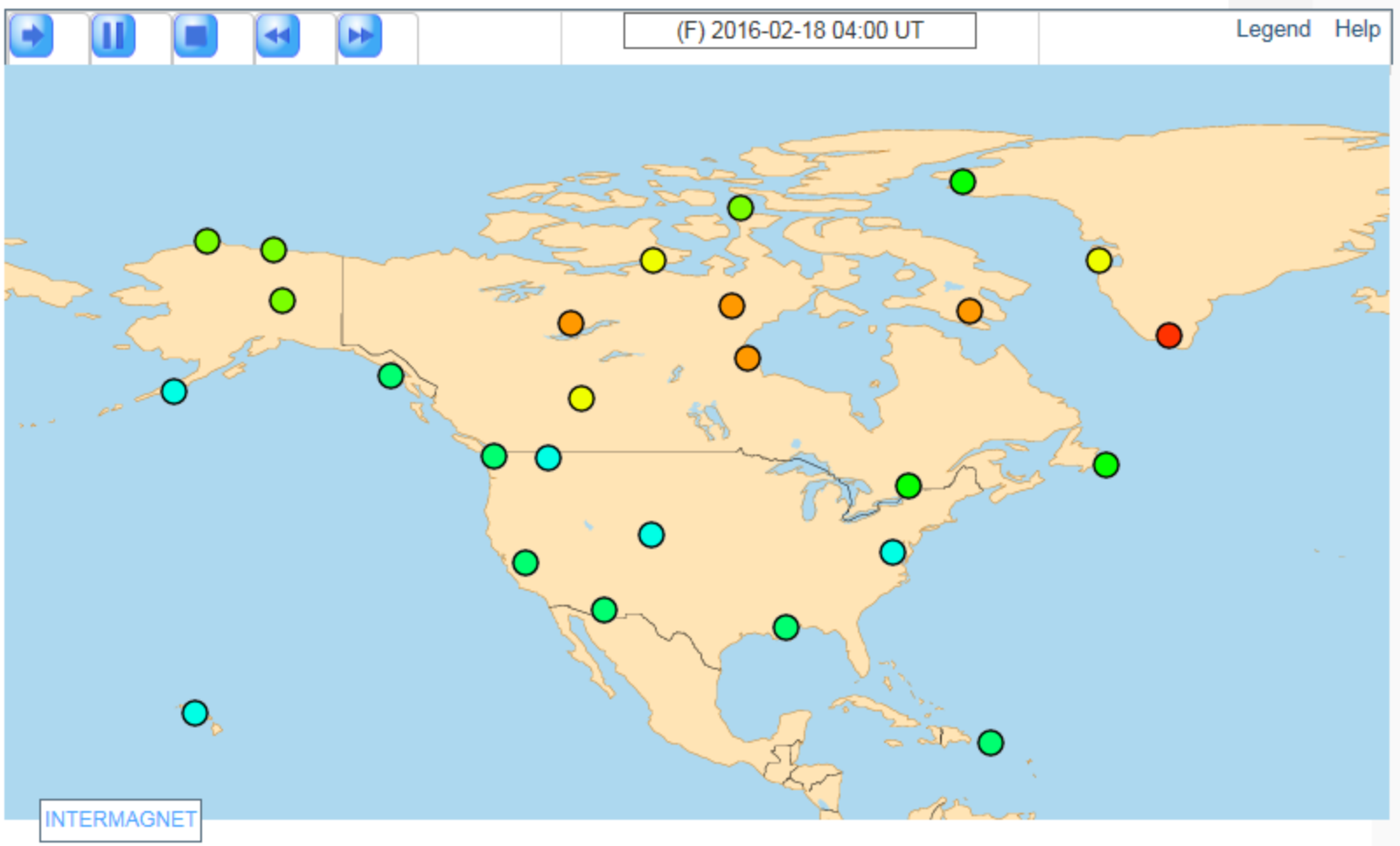
Date modified: 2015-01-19

Global Geomagnetic Activity



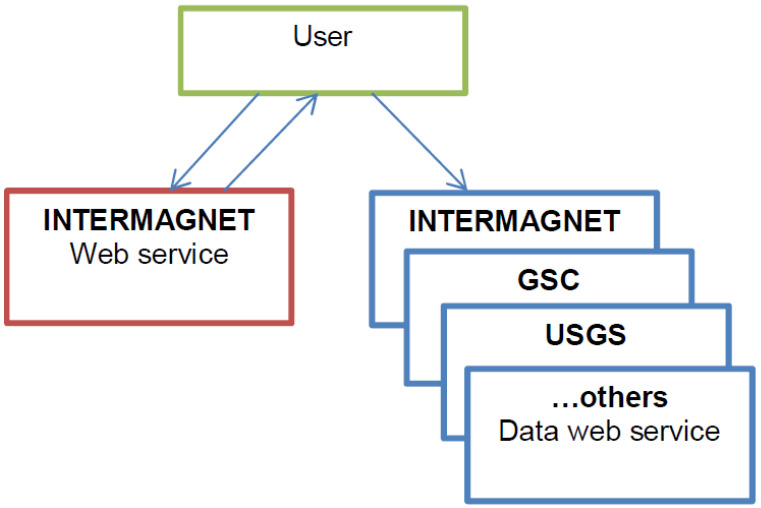
North American Activity Map





Geomagnetic Data Access

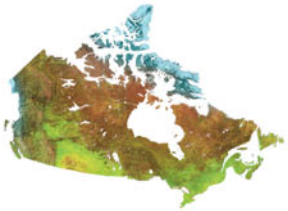
- INTERMAGNET Web Service



3.1 Parameters

Parameter	Default	Comment
id [required]	None	This is the IAGA code of the observatory. We refer this field to ID as opposed to IAGA since we want to create web service standard that do not limit the host-WS to IAGA registered stations (e.g. test observatories).
starttime	Today in ISO format	ISO 8601 date/time format are accepted only
endtime	24 hour after starttime in ISO format	ISO 8601 date/time format are accepted only
elements[]	X,Y,Z,F	Minimum supported components ("elements") are X,Y,Z,H,D,F,G,I. Must be comma separated or sent as array in parameter using [] along parameter name.
sampling_period	60	Observatory sampling period in seconds. INTERMAGNET currently only supports 1 (second) and 60 (minute).
type	None	This can be "definitive", "quasi-definitive", "provisional", and "variation". If the type is not specified, then the best available format should be returned by the INTERMAGNET web service.
format	IAGA2002	Minimum supported formats are IAGA2002 and JSON (case insensitive)

GIC Simulator



Power System

- Benchmark System
  - Stations
    - Substation 1
      - Bus 2
      - T1
    - Substation 2
      - Bus 17
      - T3
      - T4
    - Substation 3
      - Bus 15
      - Bus 16
      - T15
      - T5
    - Substation 4
      - Bus 4
      - Bus 3
      - T2
      - T13
      - T12
      - T14
    - Substation 5
      - Bus 5
      - Bus 20

File Options GIC Help

Map