Objectives:

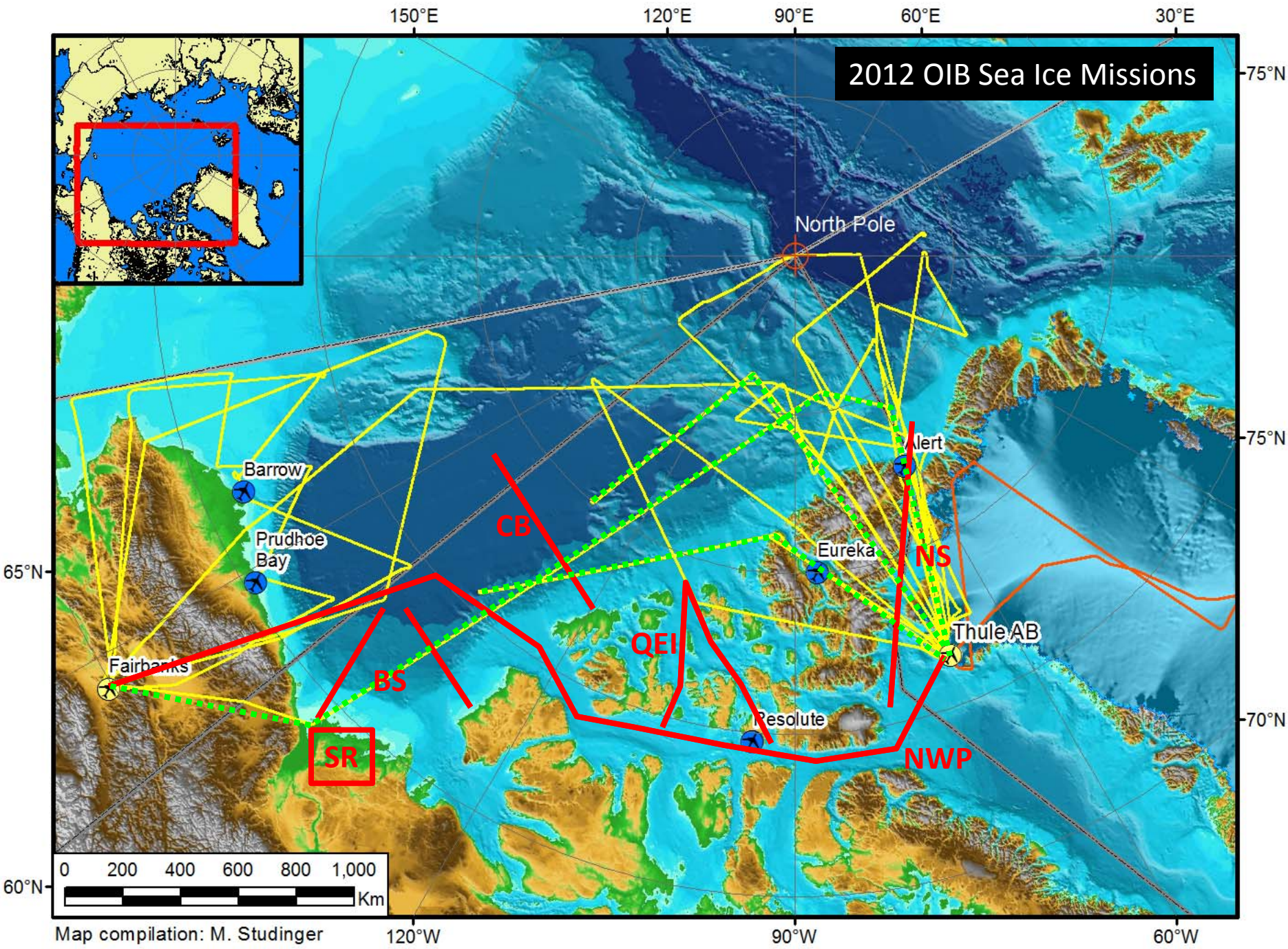
- Observe latitudinal thickness gradients in Nares Strait
- Observe thickness gradients between Canadian coast and central Arctic Ocean
- Observe ice islands and hummock fields in Beaufort Sea
- Coincide with Canadian/ESA SnowSAR campaign over Mackenzie Delta region; This campaign will obtain SWE information land along several flight lines; additional lidar surface elevation data from OIB would be very important to complement the SAR data. SEE SLIDE 5
- Observe thick multiyear ice in Canadian Archipelago and Northwest Passage

Flights (sorted by priority):

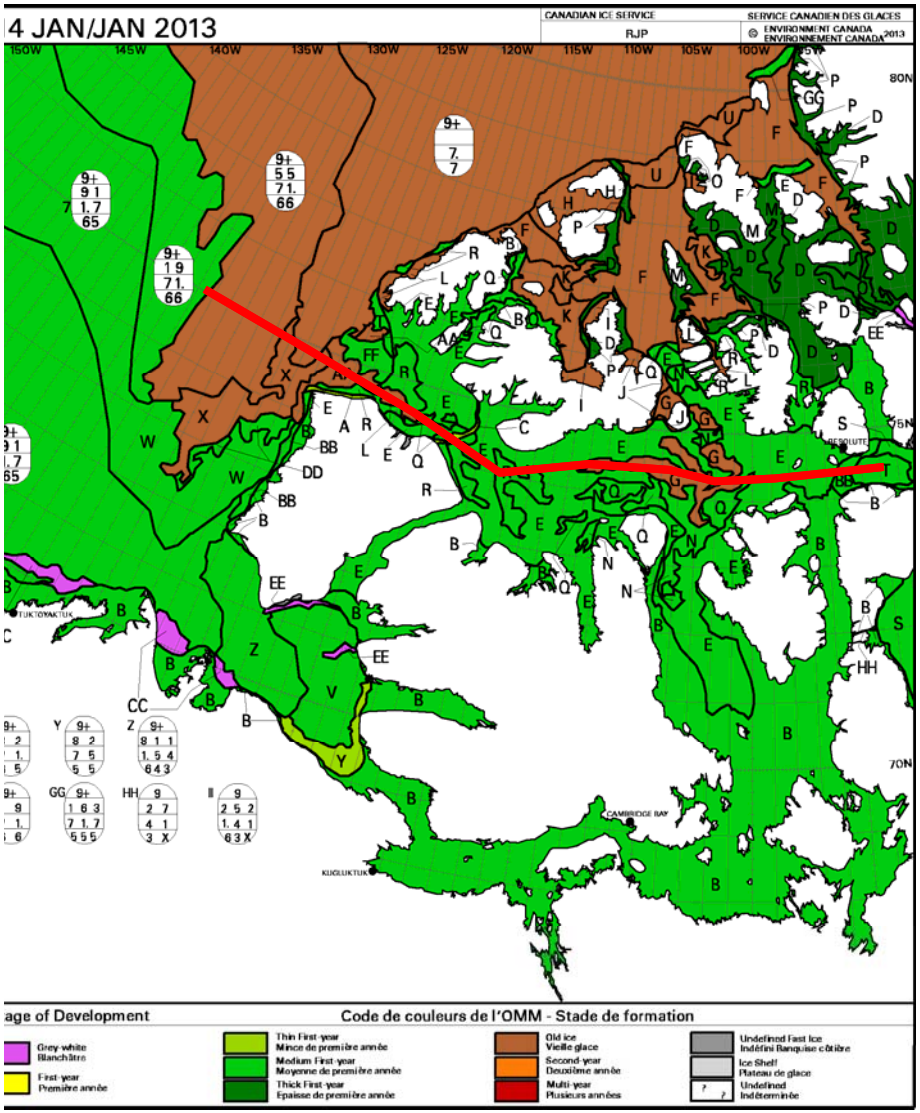
1. NS: Nares Strait
2. CB: Canada Basin
3. BS: Beaufort Sea
4. SR: Snow radar flight grid (≈1 hr)
5. QEI: Queen Elizabeth Islands
6. NWP: Northwest Passage (either Parry Channel or southern route/Amundsen Gulf); waypoints and priority depending on presence and location of multiyear ice regions

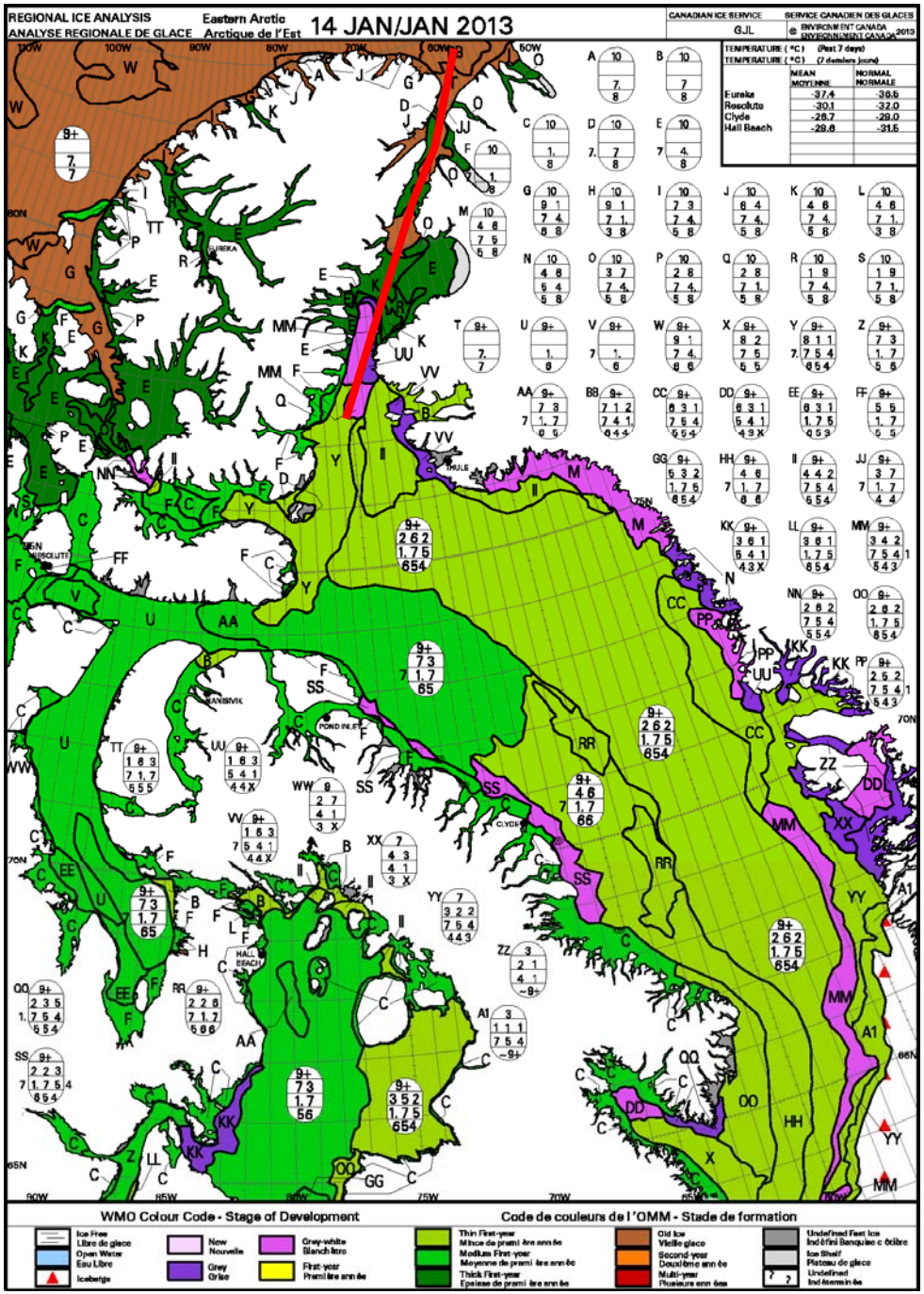
Map:

- Red lines: suggested “Canadian” flights
- Neon/green lines: Suggestions for flights which could be omitted or modified to meet Canadian suggestions


2012 OIB Sea Ice Missions
150°E
120°E
90°E
60°E
30°E
75°N
75°N
65°N
70°N
60°N
120°W
90°W
60°W
North Pole
Barrow
Prudhoe Bay
Fairbanks
Alert
Eureka
Thule AB
Resolute
CB
BS
QEI
NS
NWP
SR
0 200 400 600 800 1,000
Km
Map compilation: M. Studinger

Nares Strait and Northwest Passage

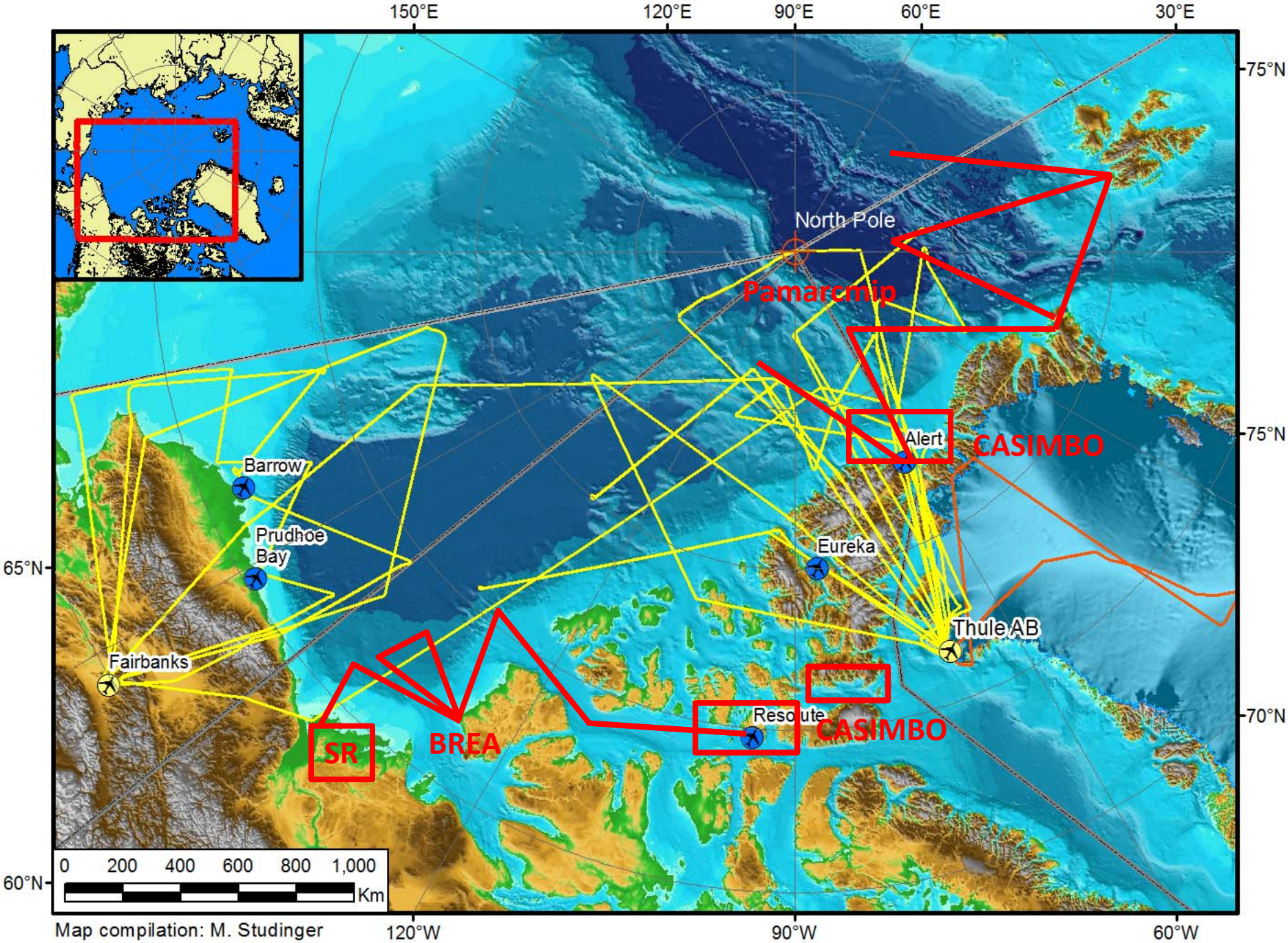




Brown: MYI; © CIS, Jan 2013

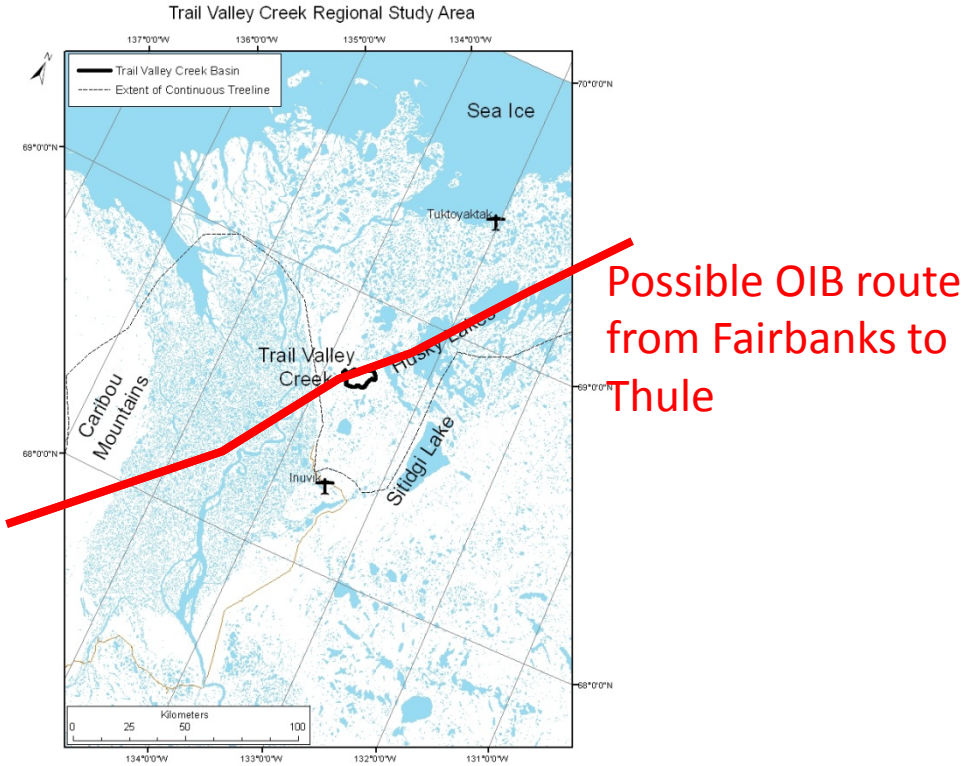
Canadian/German field plans for spring 2013

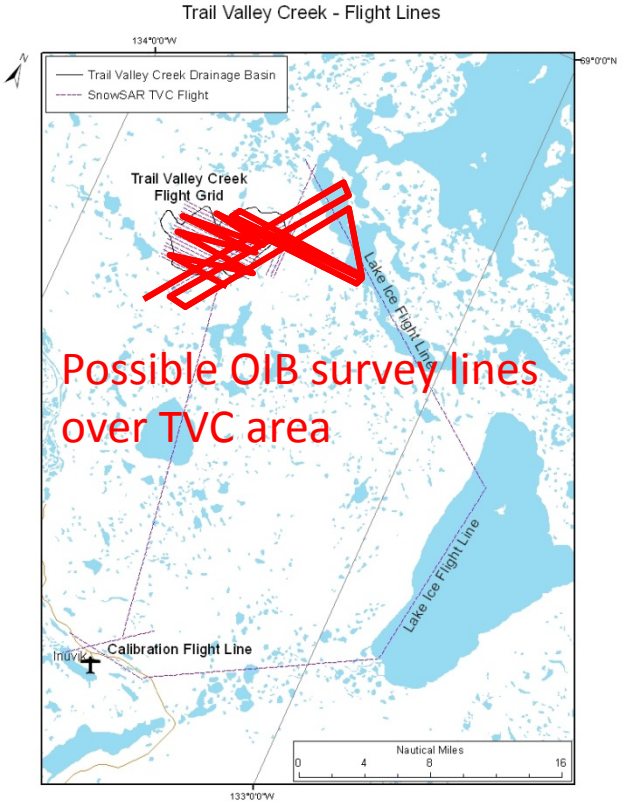
Campaign	Dates	Region	Objectives	Aircraft/ Logistics	Instruments
SnowSAR	Dec 2012 March 2013 April 2013	Snow site near Inuvik/NWT and Husky Lake	Study X& Ku snow backscatter Potential of SWE retrieval CoReH2O validation	Caravan Based in Inuvik	ESA SnowSAR Photo/Video
BREA	April 10-17	Canadian Beaufort Northwest Passage	Ice thickness of FYI and MYI Thickness of ice islands and hummock fields	Basler BT67 (JKB) Based in Inuvik and Sachs Harbor	EM Bird Lidar altimeter
Pamarcmip	April 16 – May 3	Arctic Ocean	Ice thickness	Basler BT67 (Polar 5) Based in LYR (April 16-26) Nord (April 26-May 3) Alert (April 22-26)	EM Bird Scanning lidar altimeter Snow radar
CASIMBO Alert	April 29-May 10	Alert	In-situ sea ice and snow sampling Buoy deployments	Twin Otter; landing son sea ice	EM31…
CASIMBO Resolute	May 10-17	Resolute Bay/Northwest Passage	Ice thickness Test of new snow and ice thickness instrumentation	Helicopter; landings on sea ice	EM Bird, Lidar altimeter
CASIMBO Grise Fjord	April 17-25	Jones Sound	Ice thickness, ocean heat flux, sea ice melt	Skidoo, based in Grise Fjord	EM31



Map compilation: M. Studinger

SnowSAR





Synergy with IceBridge Flights

Laser altimeter measurements from IceBridge flights could produce high resolution spatially continuous snow depth information across the TVC study area and adjacent lakes. Snow free airborne LiDAR measurements are available for TVC, facilitating the direct retrieval of snow depth. Ground measurements of snow density could be used to convert the depth retrievals to SWE, providing an independent reference dataset for evaluation of the SnowSAR retrievals. Depending on the imaging characteristics of the altimeter only a small amount of flying time (~1 or 2 hours) would be needed to image the study area. A transit flight to from Thule to Fairbanks would pass close to the TVC area, facilitating a short science flight (provided instruments are available for use on transit flights).