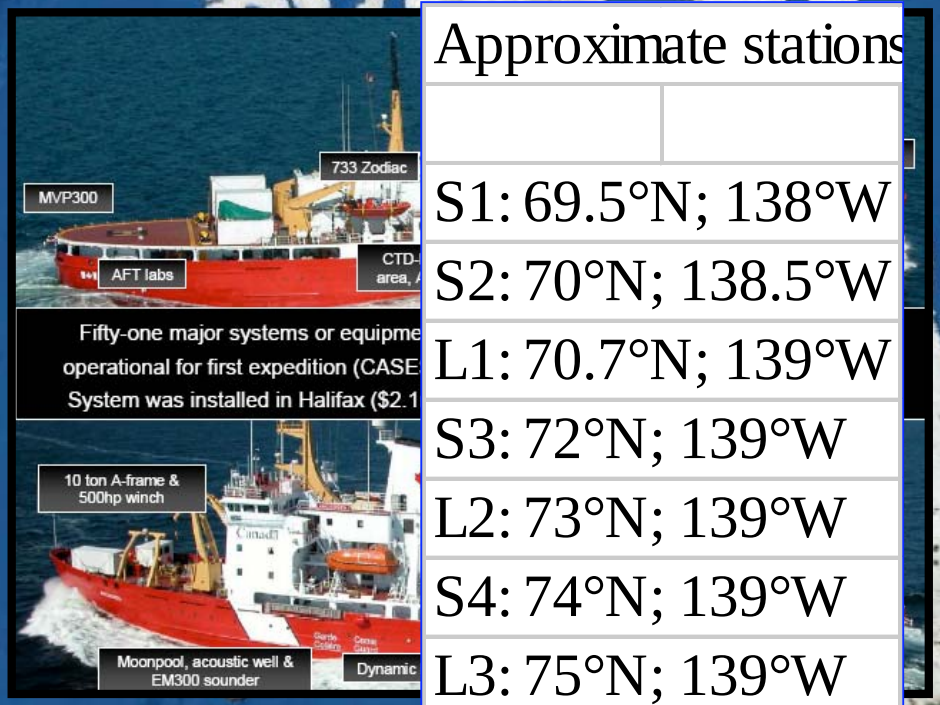
Canadian IPY-GEOTRACES
Aug 27 – Sept 12/15
2009

GEOTRACES: Multi-tracer investigation of the effect of climate change on nutrient and carbon cycles in the Arctic Ocean

Leg 3a – GEOTRACES / ArcticNet / IORVL (27 Aug – 12 Sept)



Approximate stations	
S1: 69.5°N; 138°W	
S2: 70°N; 138.5°W	
L1: 70.7°N; 139°W	
S3: 72°N; 139°W	
L2: 73°N; 139°W	
S4: 74°N; 139°W	
L3: 75°N; 139°W	
S5: 76°N; 139°W	
L4: 77°N; 139°W	

L4
S5
L3
S4
L2
S3
L1
S2
S1
Tuktoyaktuk
Paulatuk
Inuvik
L Long
S Short

LIST OF ANALYSES

GEOTRACES core measurements in red

- **Fe, Cu, Cd, Zn** (Cullen, U. Vic)
- **Al, Mn**, Ga, Ba, Pb (Orians, UBC)
- **δ^{15}N-nitrate** (Sigman, Princeton)
- **δ^{13}C-DIC** (Mucci, McGill)
- DIC, A_T, pH (Mucci, McGill / Thomas, Dal. U)
- Underway pCO_2 (equilibrator [Thomas]; MIMS [Tortell])
- Trace gases (DMS, N_2O, CH_4); MIMS (Tortell, UBC)

LIST OF ANALYSES

GEOTRACES core measurements in red

- Biota-trace element interactions (Maldonado, UBC):

Trace metal quotas of size-fractionated particles

Rates of trace metal uptake (^{14}C, ^{109}Cd, ^{55}Fe)

- Primary production (Tortell/Maldonado/Varela):

(^{13}C, ^{15}N, O_2/Ar), Si uptake, C:N:Si uptake ratios

- Phytoplankton biomass, species composition

Microscopy, pigments, flow cytometry

- Photosynthetic competence

LIST OF ANALYSES

GEOTRACES core measurements in red

- Proteomics, genomics (Maldonado, Rivkin)
- Microbiology (Rivkin, Memorial)

Microbial stocks and community structure

Microbial growth, mortality and respiration

Uptake and/or release of carbon, nitrogen and essential trace elements (i.e. Fe, Zn, Cd, Cu, etc) by bacteria and microzooplankton

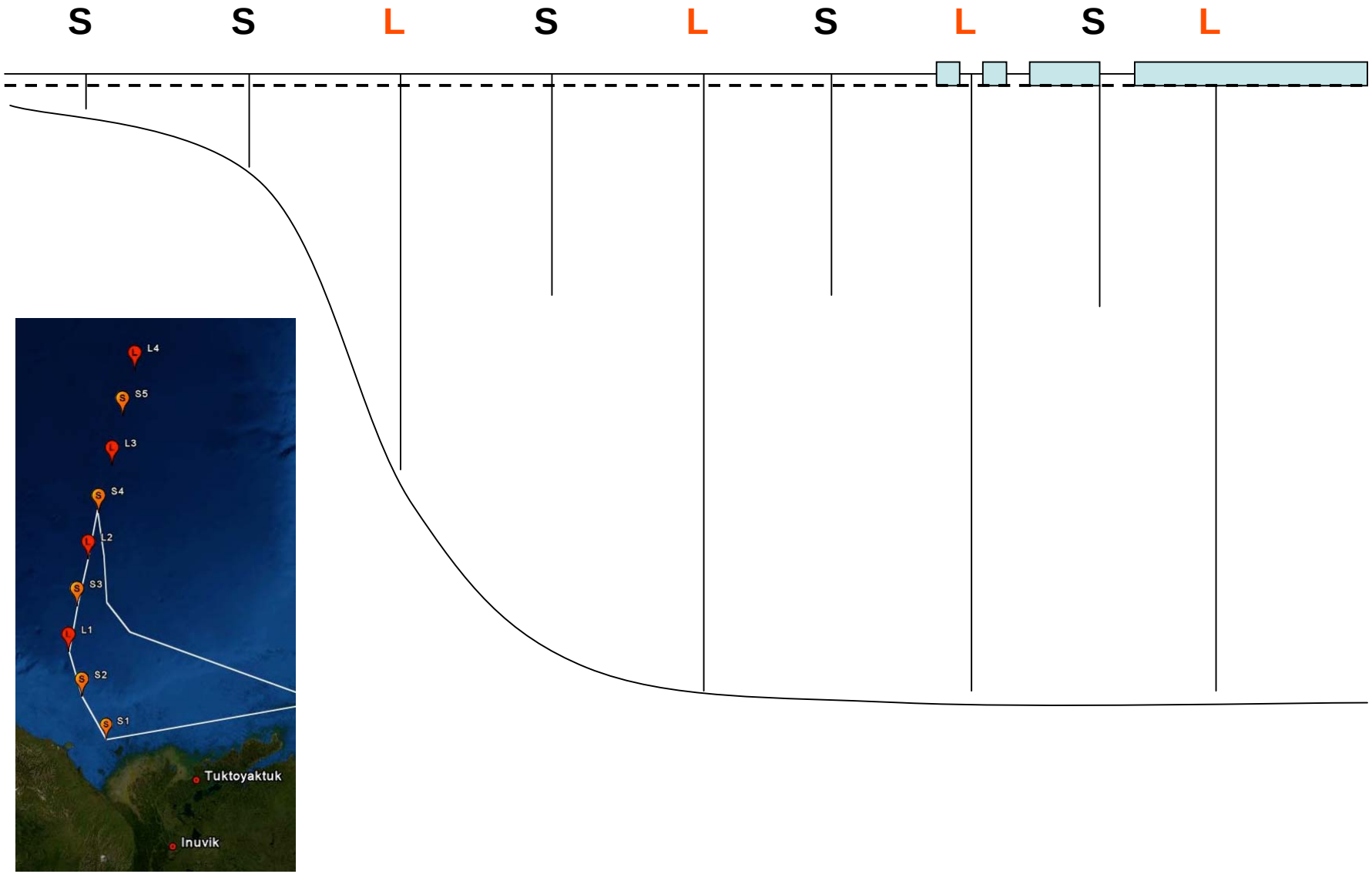
DOC/POC

- Alkenones (Kienast, Dalhousie)

LIST OF ANALYSES

GEOTRACES core measurements in red

- ^{230}Th, ^{231}Pa (Francois, UBC)
- ^{234}Th (Miller, IOS; Francois, UBC)
- Pb isotopes (Orians/Weis, UBC)
- Nd isotopes (Weis/Francois, UBC)
- Cr and U isotopes (Holmden, U. Sask.)
- Si isotopes (Varela, U. Vic)
- Ra isotopes (Thomas, Dalhousie)
- Particles (McLane pumps)
- No aerosol sampling


S
S
L
S
L
S
L
S
L
L4
S5
L3
S4
L2
S3
L1
S2
S1
Tuktoyaktuk
Inuvik

“LONG” STATIONS

- 2 TM rosette casts (24 depths)

  trace metals

- 2 TM rosette cast (12 depths)

  Pb isotopes; Cr/U isotopes

- 2 pump casts (12 depths) – Supor

  Th/Pa; TM; Major elements

- 2 pump casts (12 depths) – QMA (POC, alkenones, genomics; proteomics)

  Th/Pa; TM; Major elements

- 2 shallow hydrocasts (biology) – 6 depths/100m

  ^{234}Th/POC; PP (^{13}C/^{15}N); SiO_2; cytometry; pigments; bact prod.; gases; DIC/AT; δ^{13}C (DIC; POC); δ^{18}O; δ^{15}N (nitrate; PON); Flowcam; δ^{13}C-FA; micrograzers; respiration rates

“LONG” STATIONS

- 1 deep hydrocast (biology)

  Resp rates; POC/POC; d13C/d15N; DOC; d13C-FA

- 2 hydrocasts (12 depths)

  Pa/Th; 226Ra

  DIC; AT; pH; d15N-nitrate; Th-234; SiO2; gases; bact prod.; bact abundances; microzoo; d18O; Ba

- 1 pump cast (6 depths) – Supor

  Si isotopes

Wire time: 48h x 4

“SHORT” STATIONS

- 1 TM rosette cast (12 depths)

  trace metals

- 1 shallow hydrocast (biology) – 6 depths/100m

  ^{234}Th/POC; PP (^{13}C/^{15}N); SiO_2; cytometry; pigments; bact prod.; gases; DIC/AT; d^{13}C (DIC; POC); d^{18}O; d^{15}N (nitrate; PON); Flowcam; d^{13}C-FA; micrograzers; respiration rates

- 1 pump cast (6 depths) – QMA (POC, alkenones, genomics; proteomics)

- 1 deeper hydrocast

  DIC/AT; d15N-nitrate; SiO2; gases; bact abundances; Ba; Nd; Ra


CANADIAN GEOTRACES
NSERC STRATEGIC NETWORK
90°N
80°N
70°N
60°N
50°N
180°E
150°W
120°W
90°W
60°W
IPY
1
2
3
3
4
FR
NL
US
JPN
Intercalibration
Station
Ocean Data View