

ICYCLER:

Energy-efficient ocean surface layer profiler
moored under mobile pack ice

Greg Siddall and George Fowler

Bedford Institute of Oceanography

Dartmouth, N.S., Canada

www.mar.dfo-mpo.gc.ca/science/ocean/seaice/public.html

ASOF Moorings

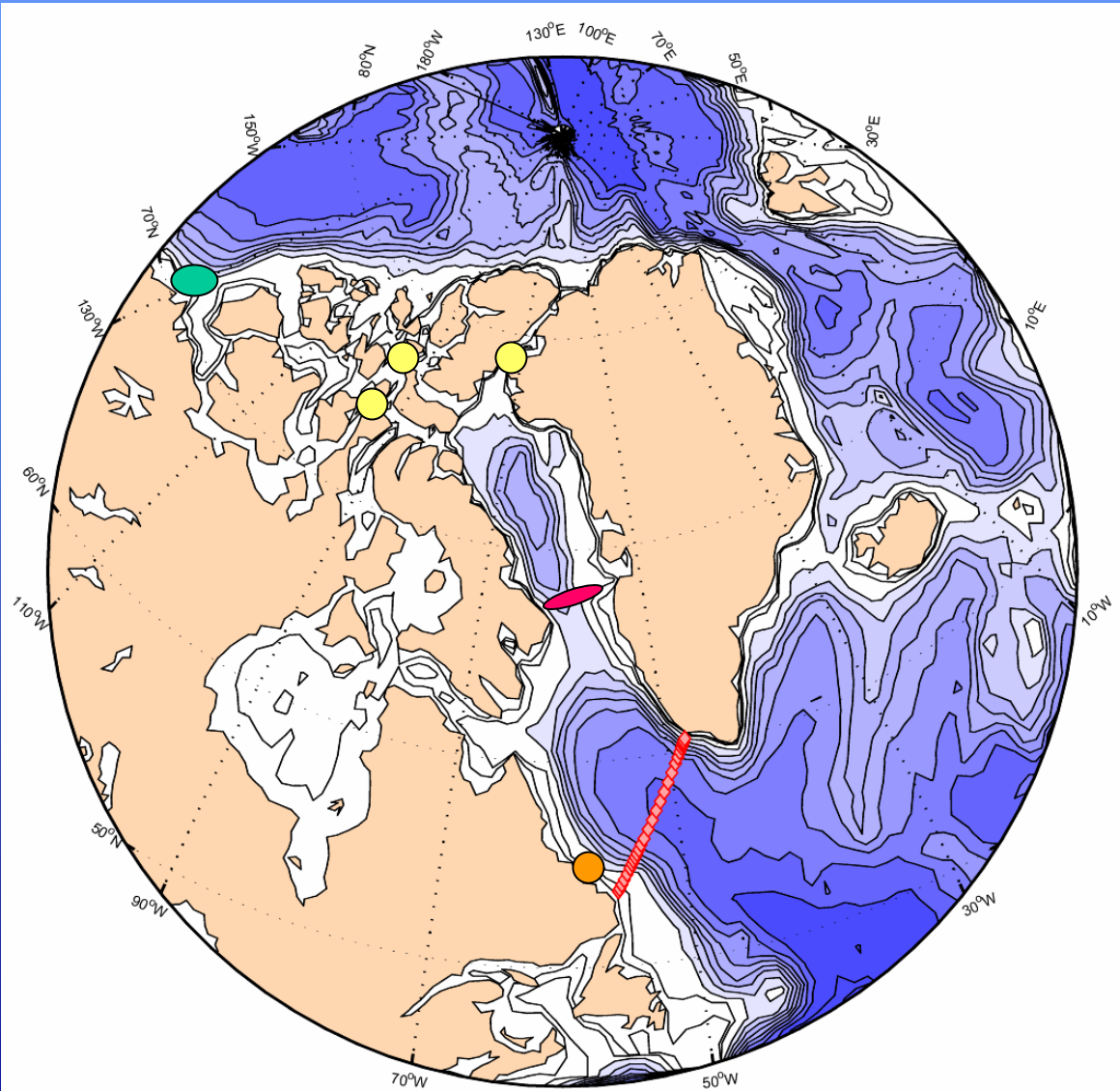
Mooring programs

 CASES

 CATS

 DAVIS Strait

 Nwld shelf

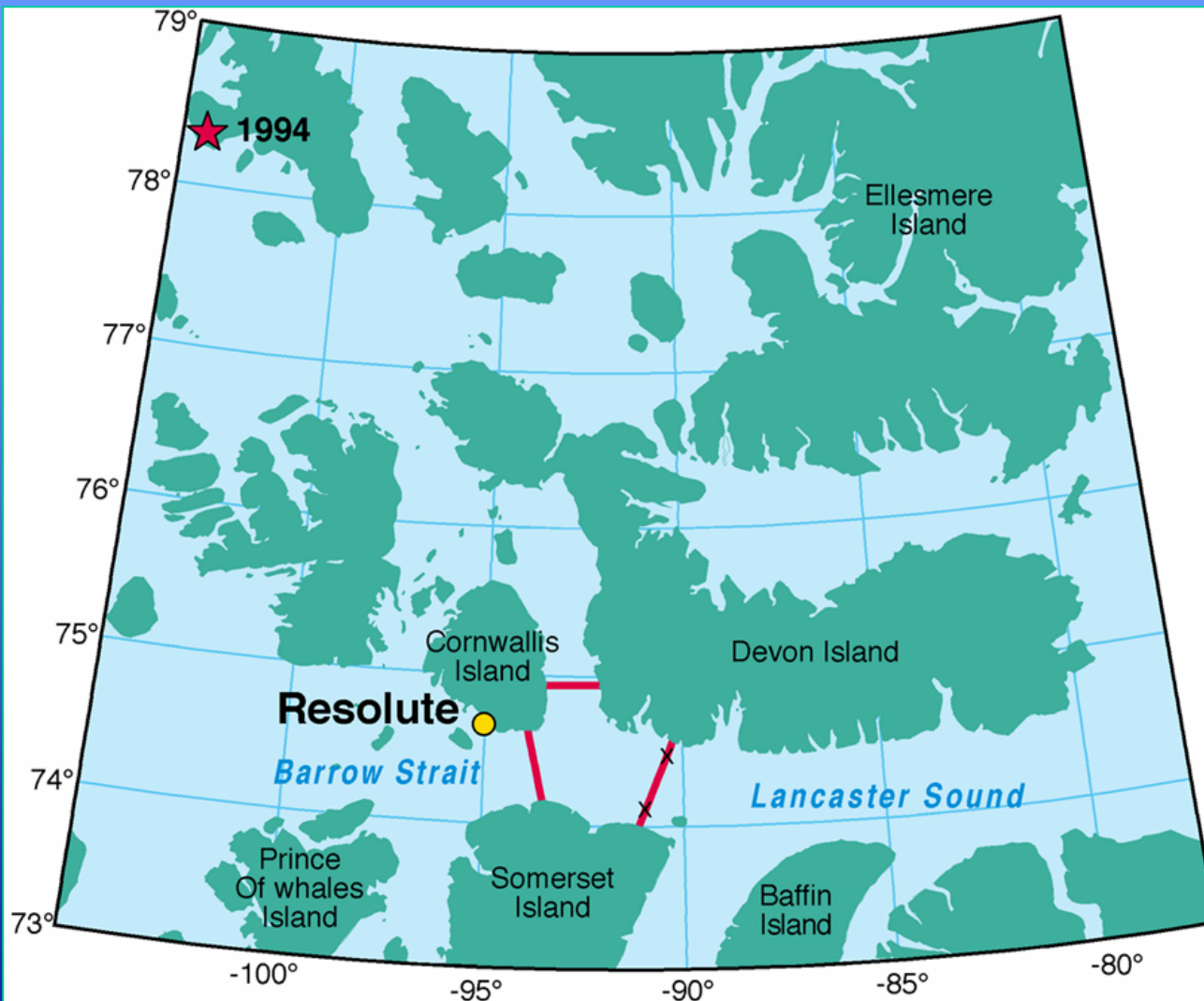


ICYCLER Design:

- yearlong provide daily surface 50m profiles
 - avoid ice ridges up to 30m thick
 - currents up to 60cm/sec

and for future considerations

- 250m profiles for iceberg avoidance
 - wave avoidance
- data link under calm sea conditions



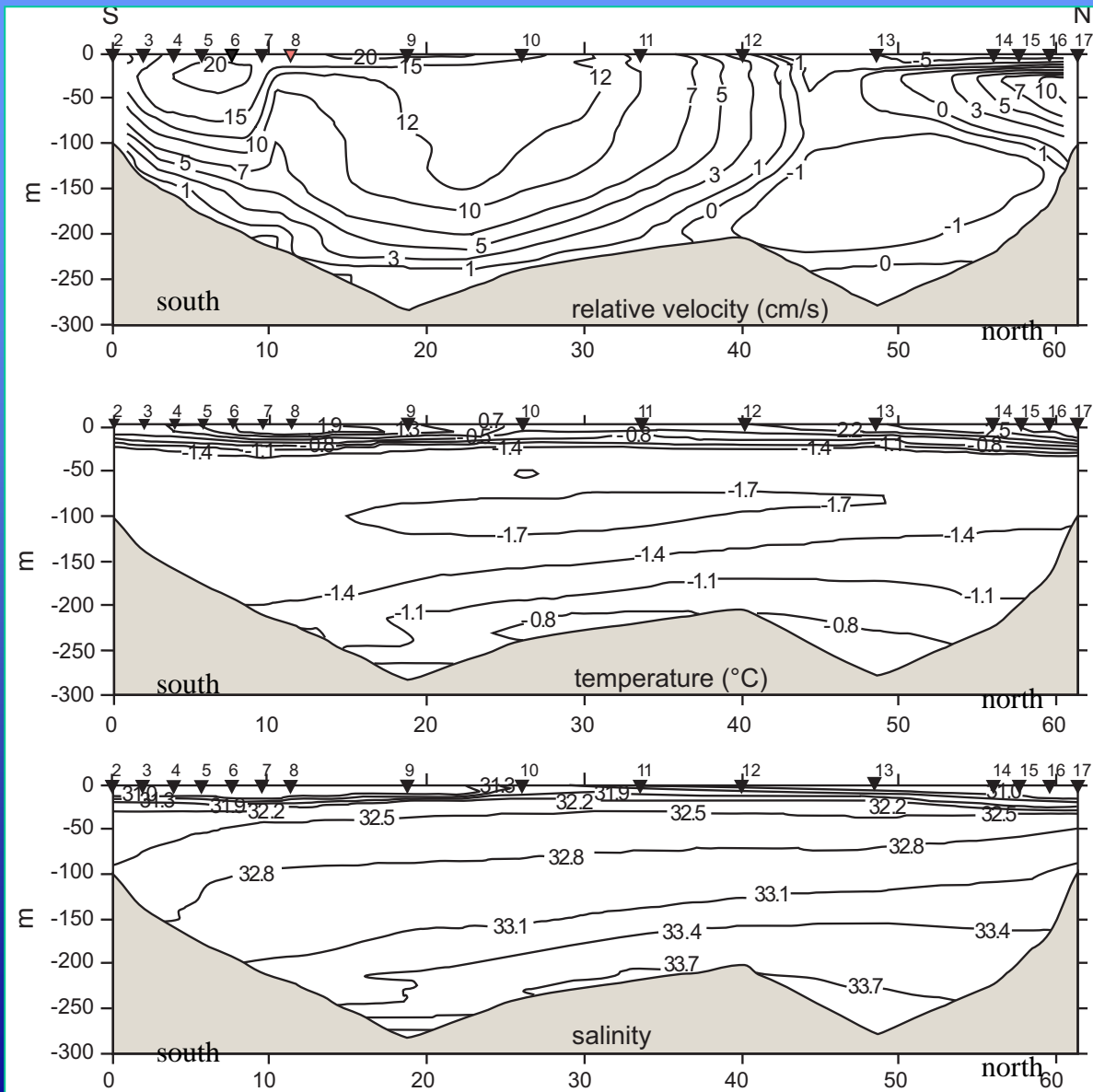
Work area for the Barrow Strait Flow-through Study. The X's denote the northern and southern mooring sites. The red lines represent the CTD lines completed.

CATS/BIO
Canadian Archipelago
Mooring and CTD
study area

X- Yearlong moorings
1998-99 to 2000-01

— CTD transects

program supported by
Can. Coast Guard
Icebreakers

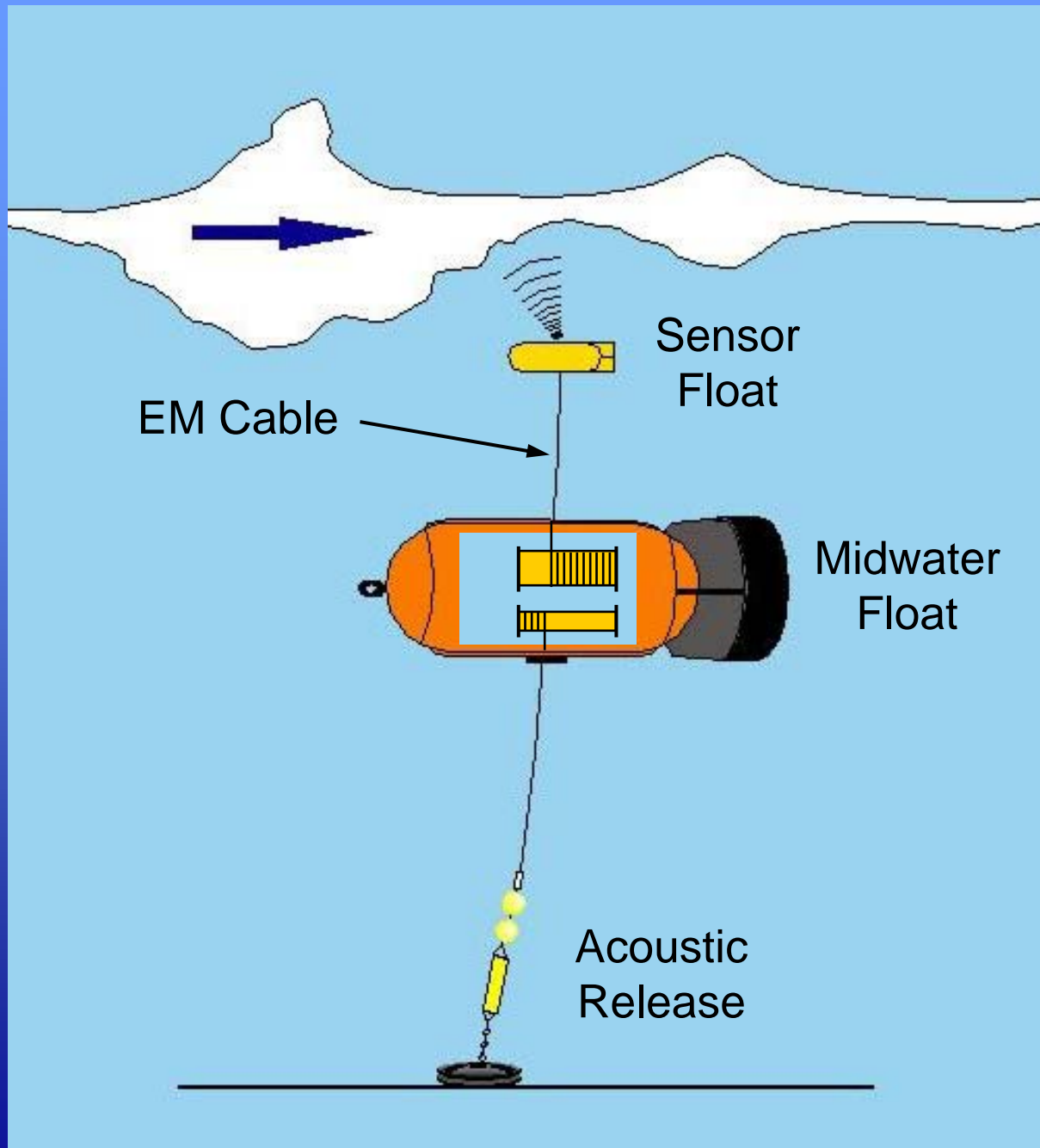


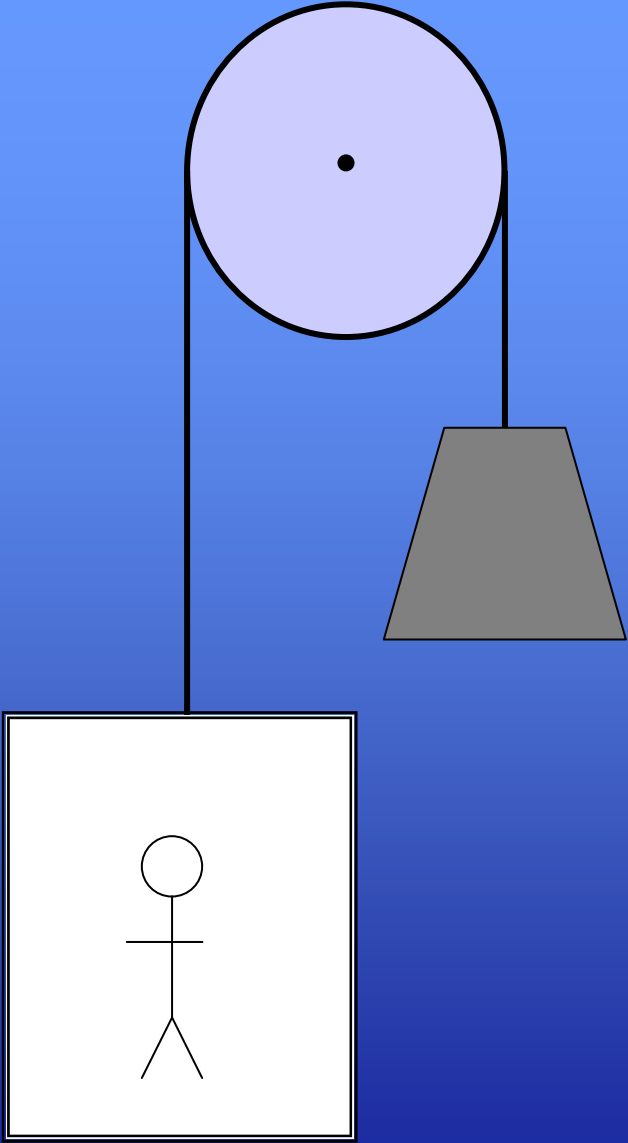
Summer 1998

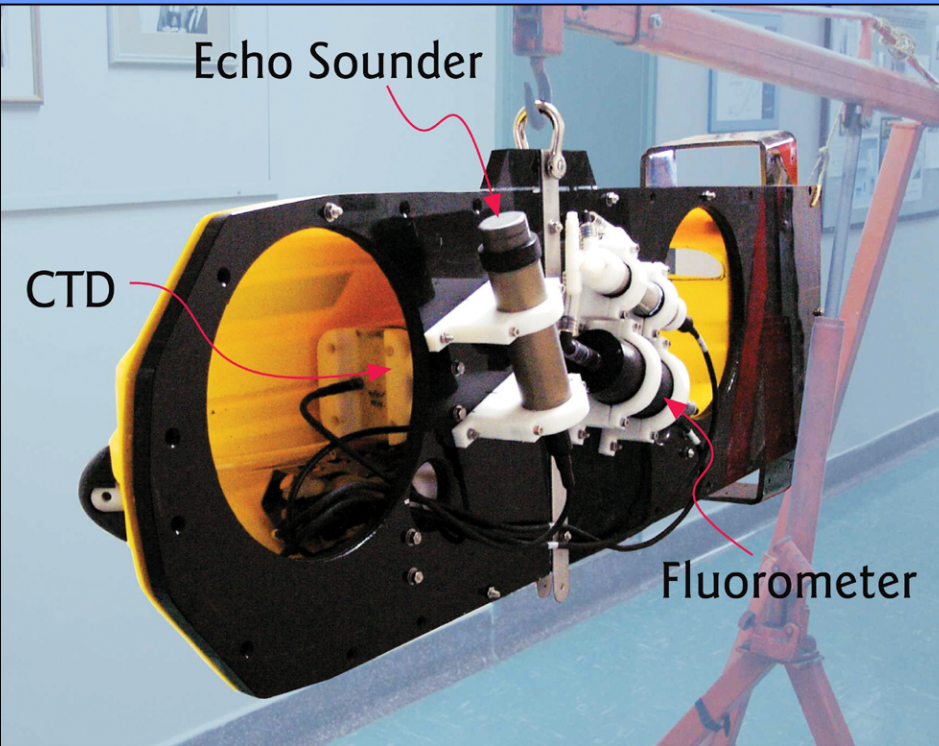
Geostrophic currents
across Lancaster Sound
at mooring transect

(looking west to Arctic)

as derived from CTD
profiles with positive
currents to Baffin Bay.





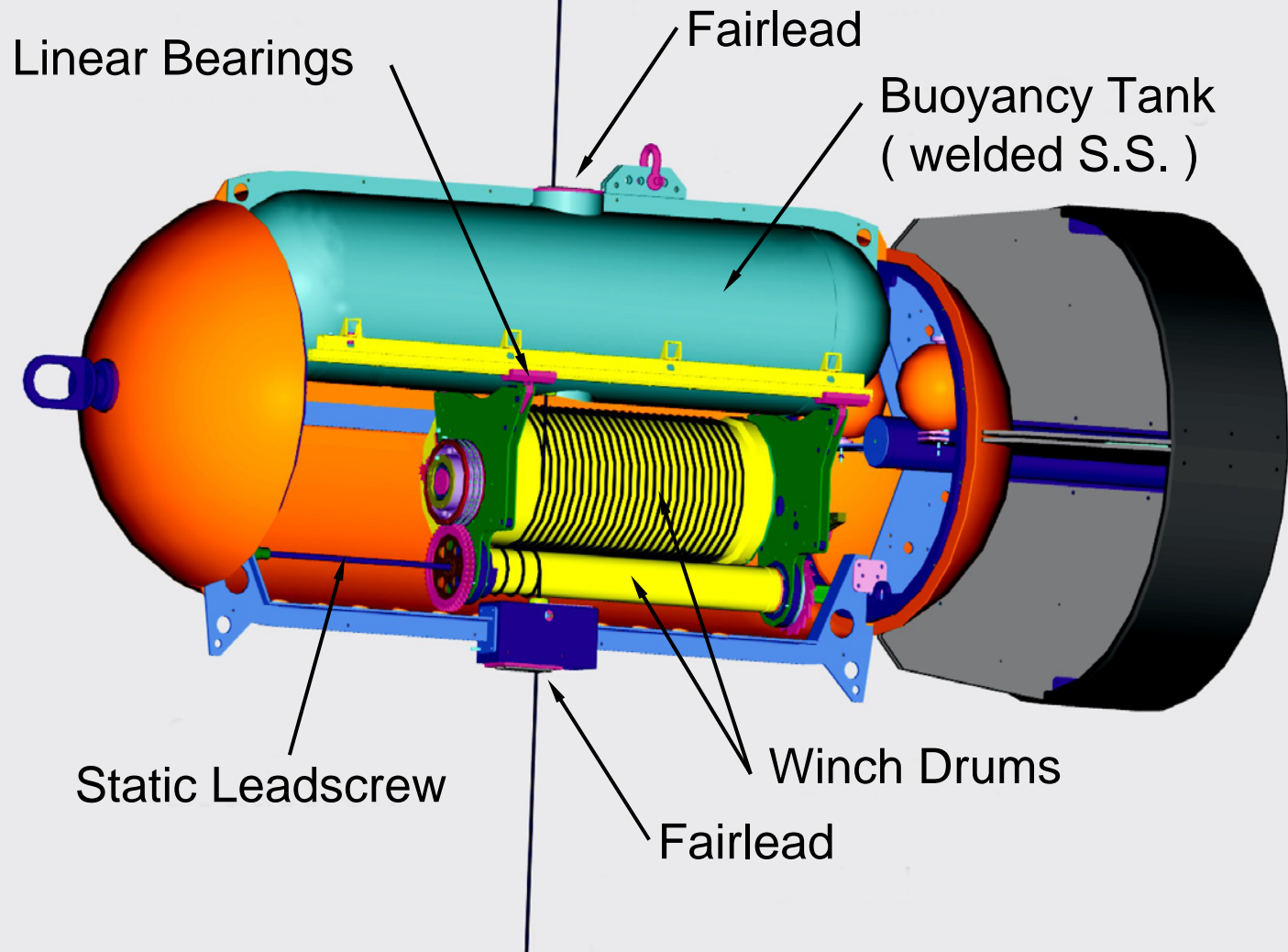


Net Buoyancy = 137 N (30 lbs)

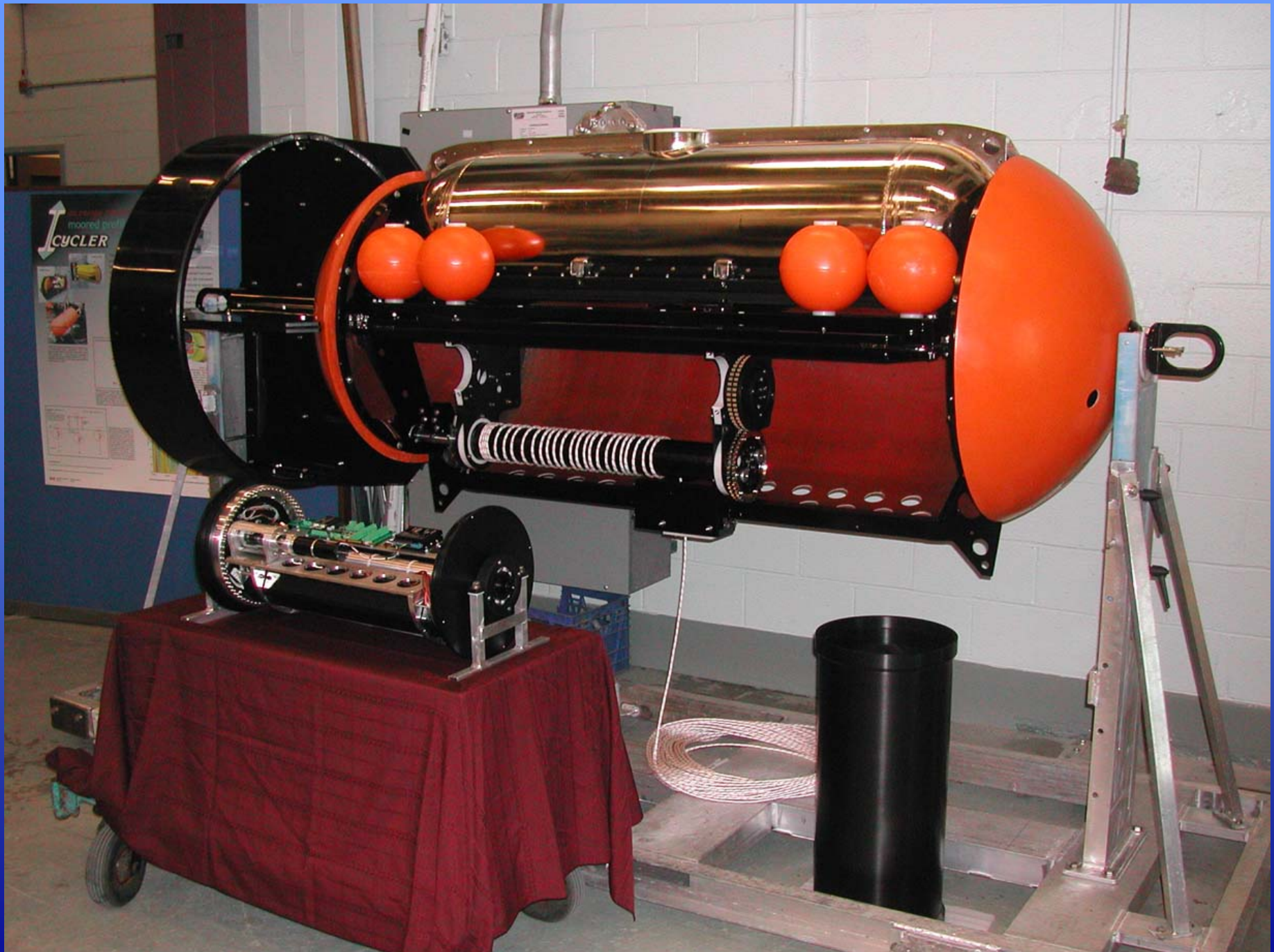
Datasonics Altimeter

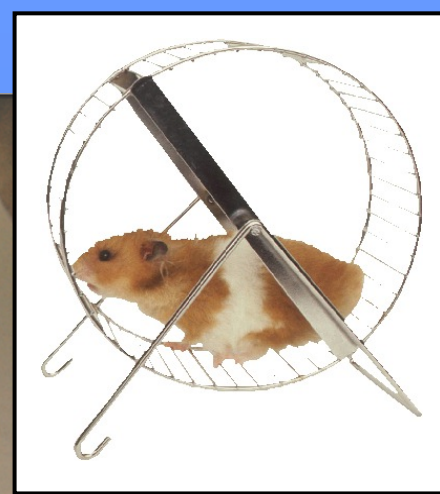
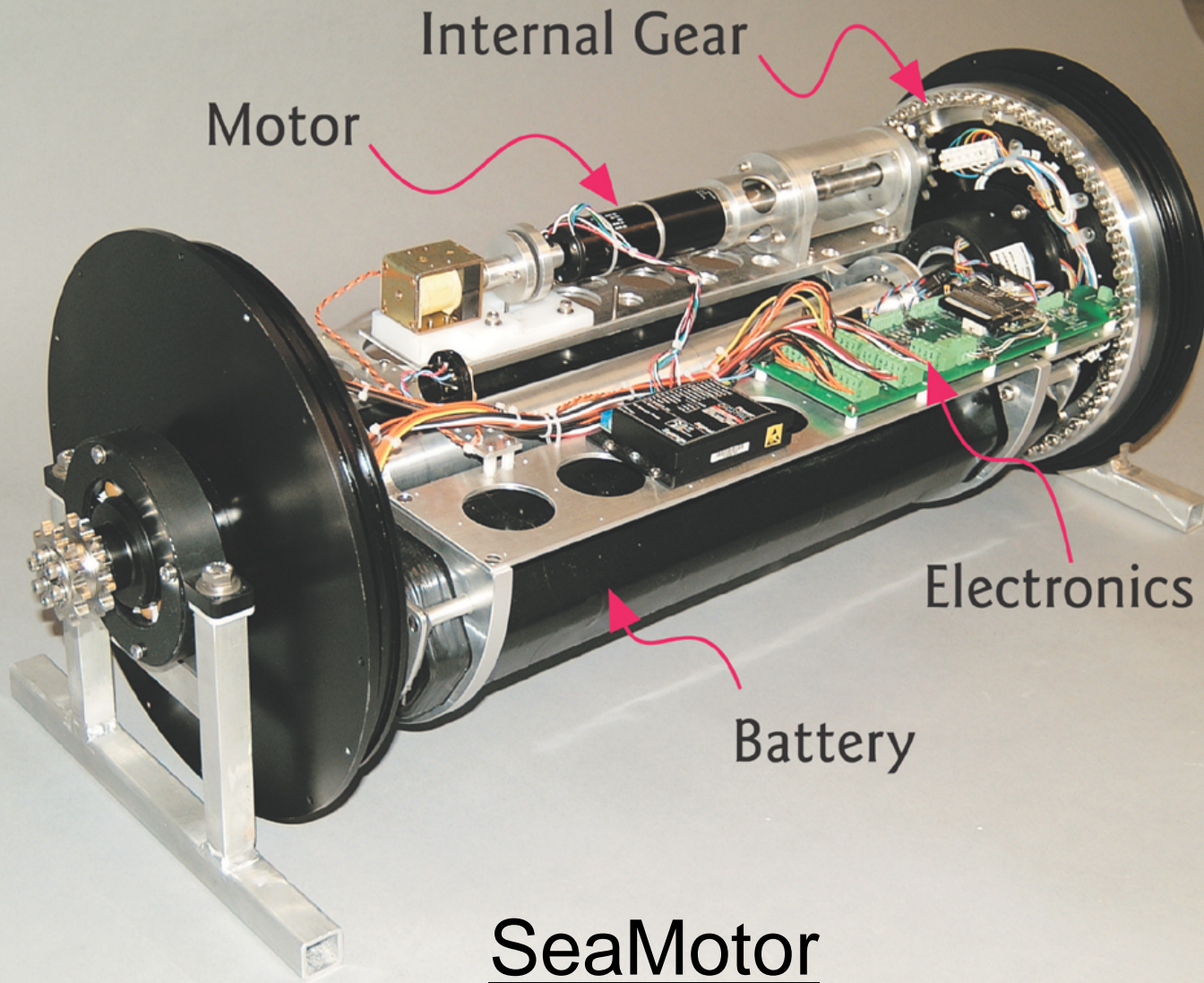
Seabird 19+ CTD

Wetlabs Fluorometer



Length = 3 m (10 ft)
Weight = 3000 N (700 lbs)



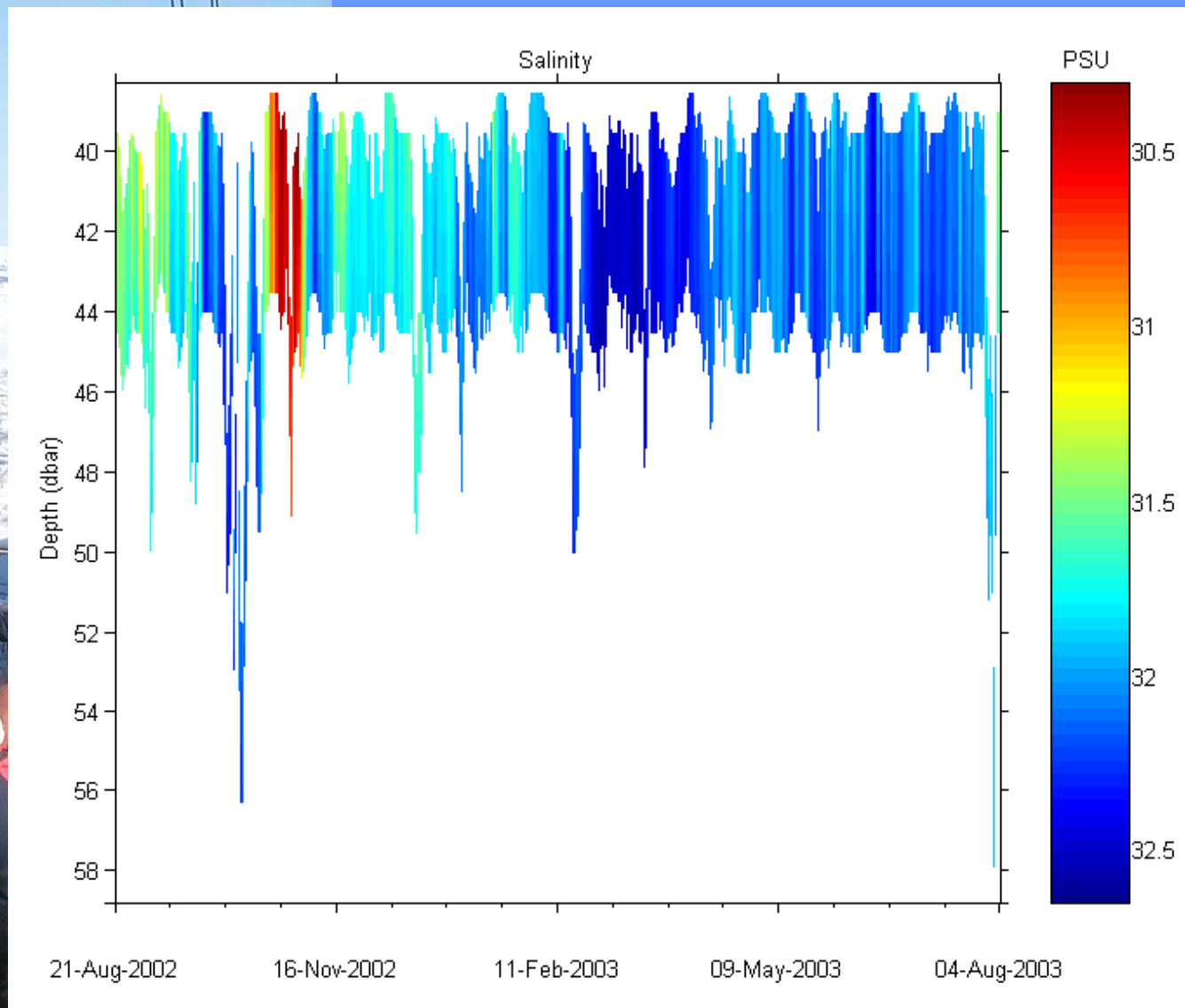
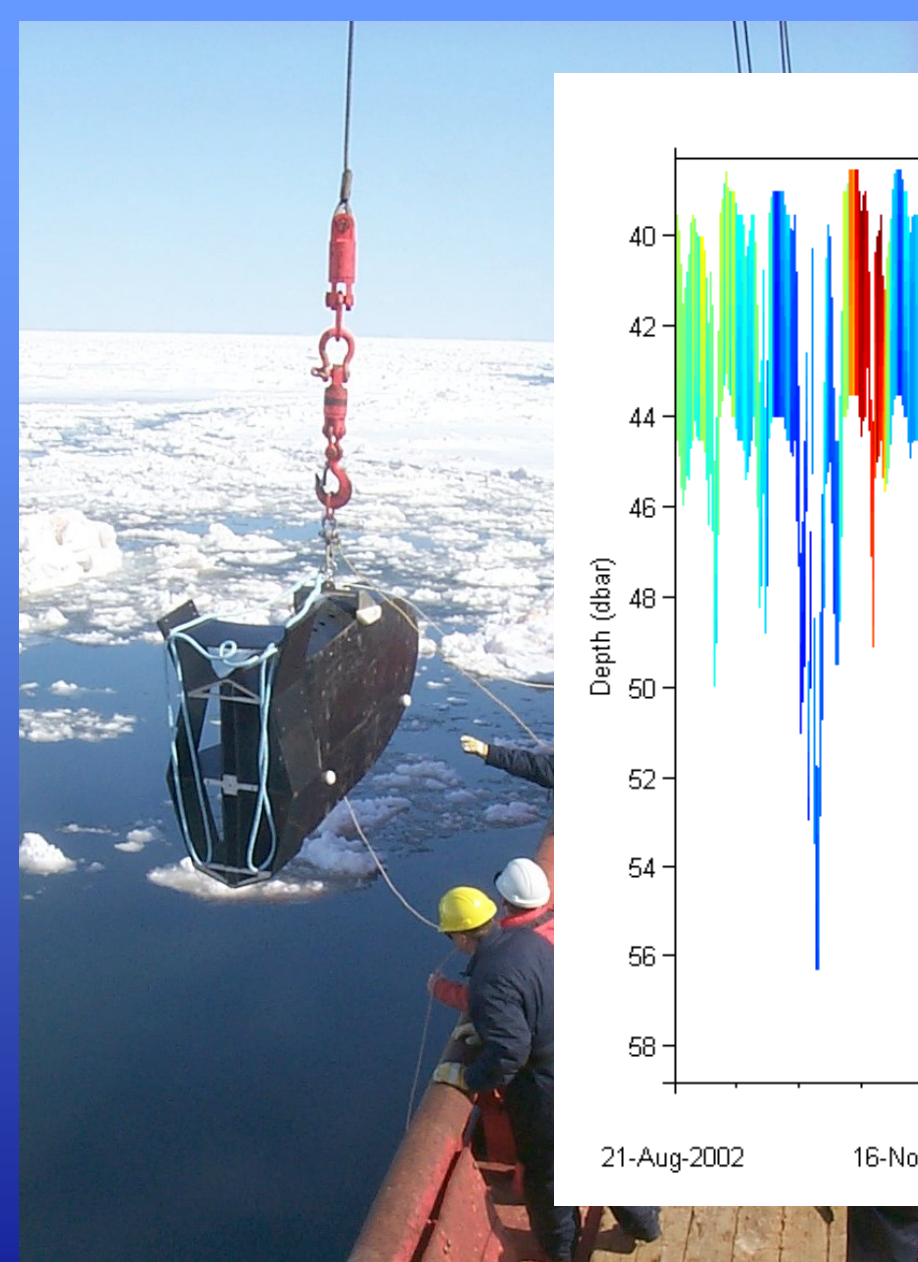




Icycler Prototype



Icycler 2





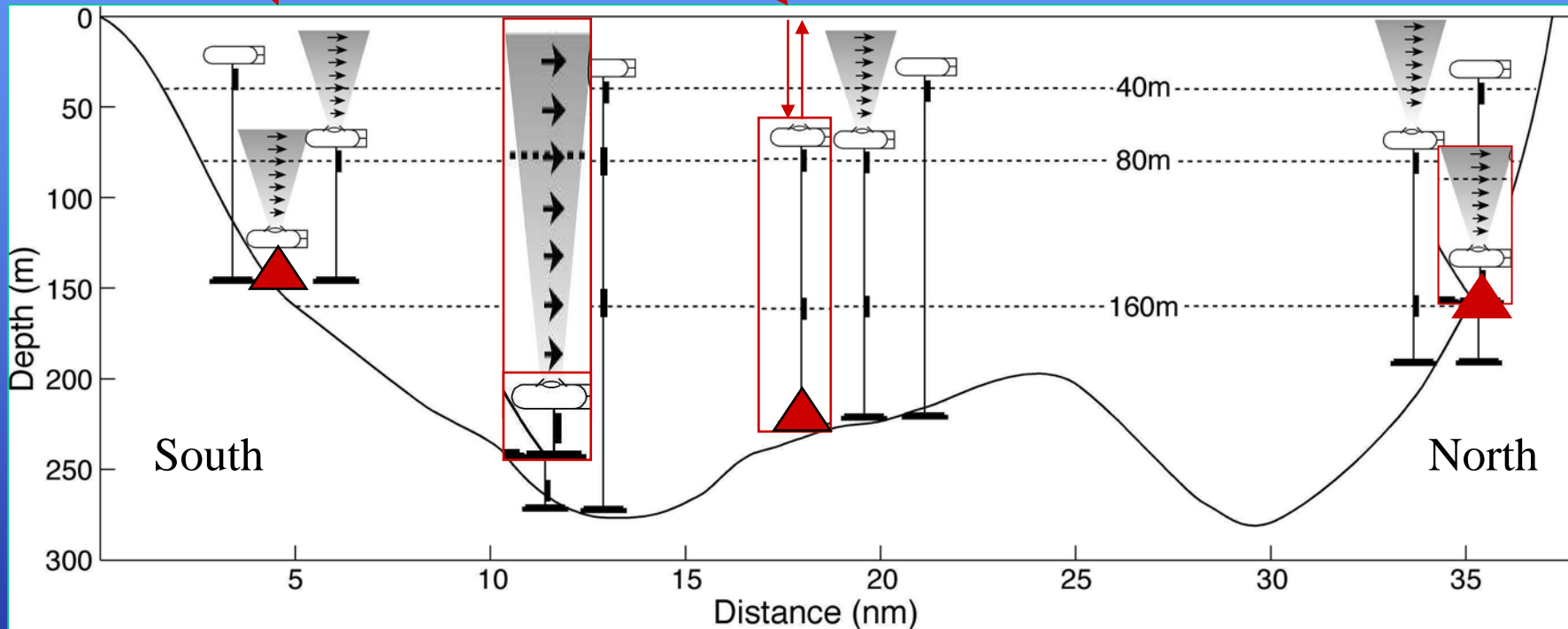
**23 Watts Power
Consumption**



2003-2004 moorings

Also ICYCLER site

ULS



Tide Gauge Site (4) - NOAA



ULS (1) - NOAA

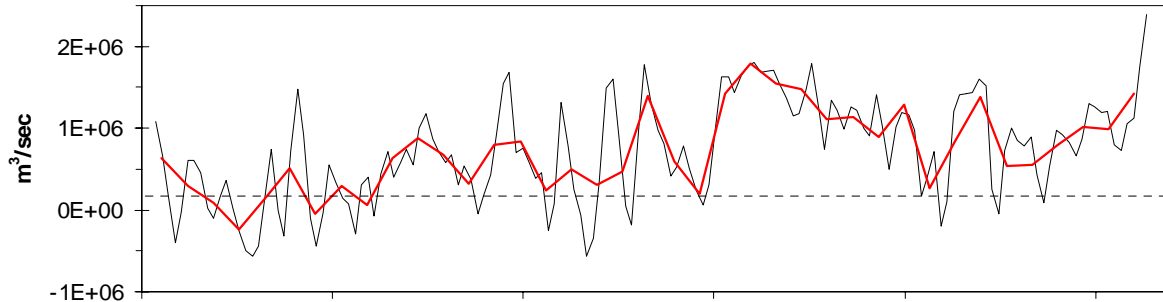


ADCP (1 LRange) - NOAA

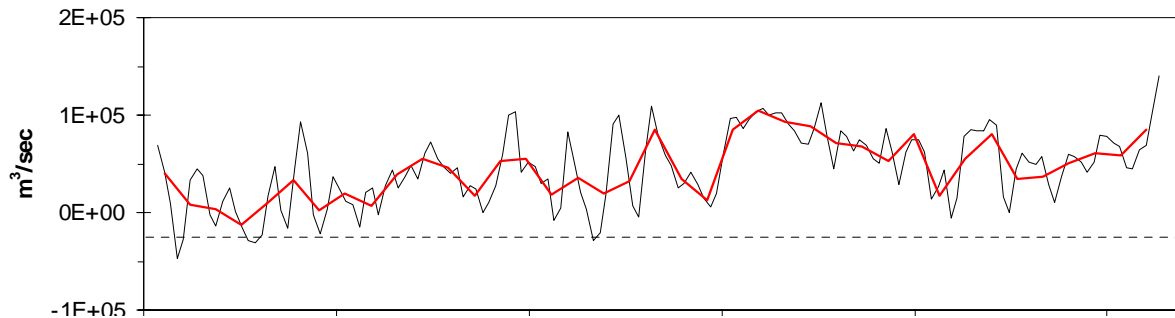
CATS Lancaster sound mooring



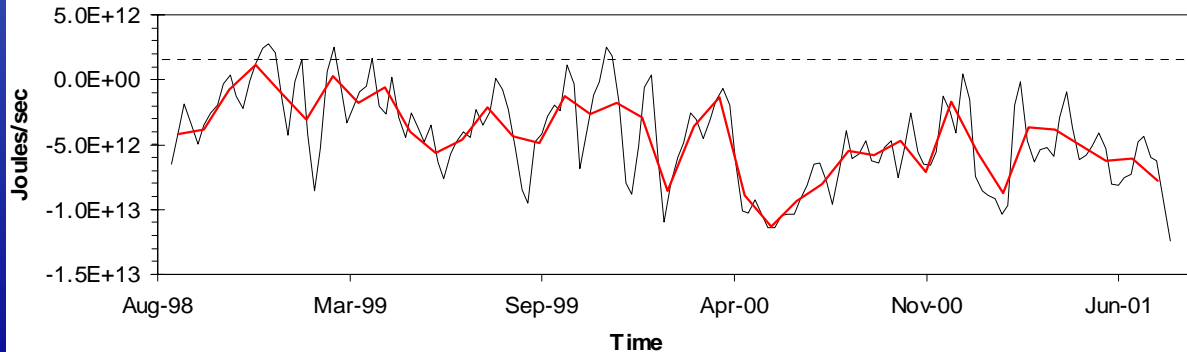
Volume Transport



Fresh Water Transport



Heat Flux



Transports through Lancaster Sound

seasonal weighted
2/3 southern site data and
1/3 northern site data



**Fisheries and Oceans
Canada
Bedford Institute of Oceanography**

**Pêches et Océans
Canada**

Data and Results on BIO's web-site

www.mar.dfo-mpo.gc.ca/science/ocean/seaice/public.html

- Data reports - Simon Prinsenbergs (program - BIO) at 902 426 5928
- J. Articles - Jim Hamilton (Field survey - BIO) at 902 426 3638
- George Fowler (ICYCLER - BIO) at 902 426 3717
- Greg Siddall (ICYCLER - BIO) at 902 426 3223

[prinsenbergs@](mailto:prinsenbergs@mar.dfo-mpo.gc.ca) and [hamiltonj@](mailto:hamiltonj@mar.dfo-mpo.gc.ca) and fowlerg@mar.dfo-mpo.gc.ca