



# The International ARGO project and the Dutch contribution

**Andreas Sterl**

Andreas Sterl: Argo Project, NIOZ, 05.04.2006



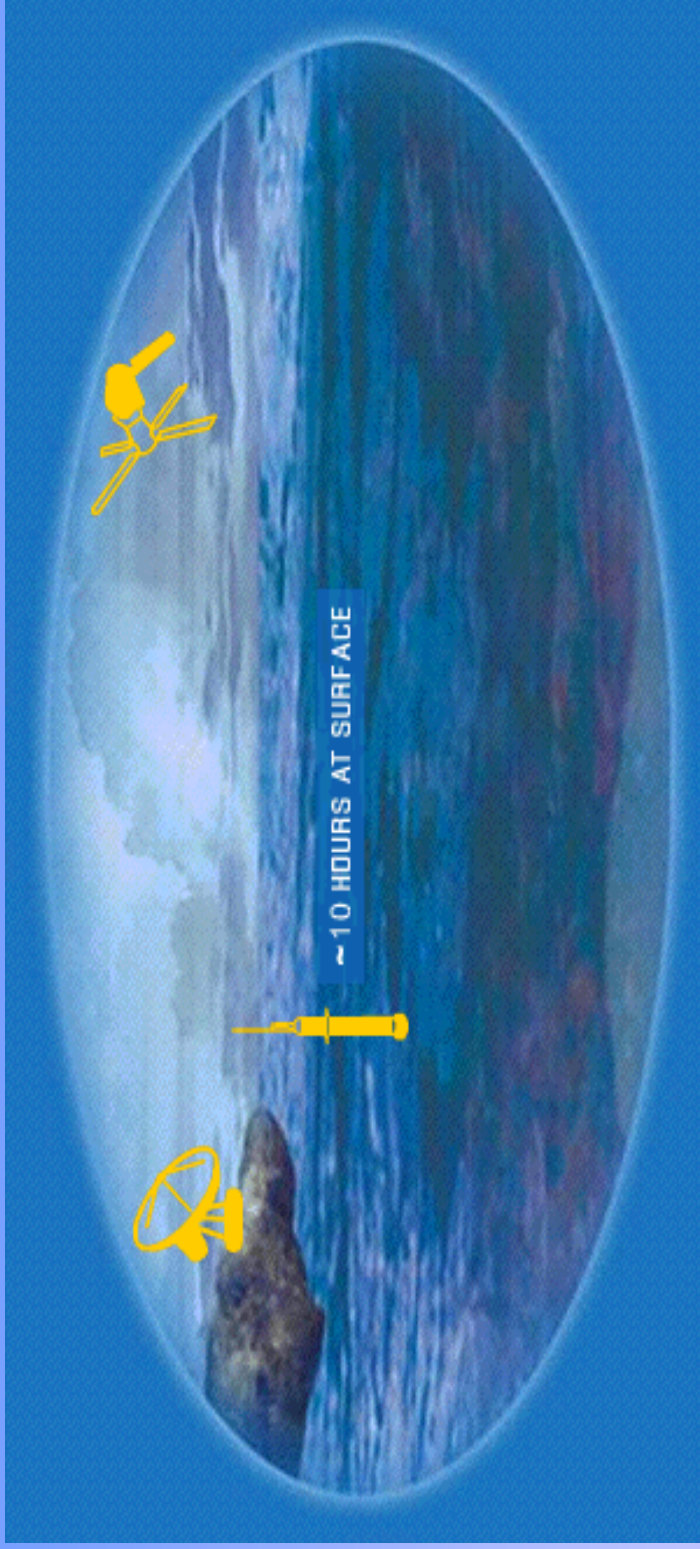
## What is Argo ?

- A new way to collect data from the ocean using robot floats
- « Take the pulse » of the Ocean's upper layer in real-time
- **Complement** to satellite and other in-situ observing systems
- Access to **data is free** and unrestricted
- Target - a **3° x 3°** global array ( ~3000 floats)

### *Benefits:*

- **Improve Ocean and Climate forecasting**
  - **Understand ocean-atmosphere interactions**
  - **Predict seasonal to decadal climate variability**
- 
- **Wide range of applications for high-quality**
  - **global ocean analyses is anticipated**

# Standard Float Cycle



➤ Drifting Depth: **1000 m**

➤ Profiling Depth: **2000 m**

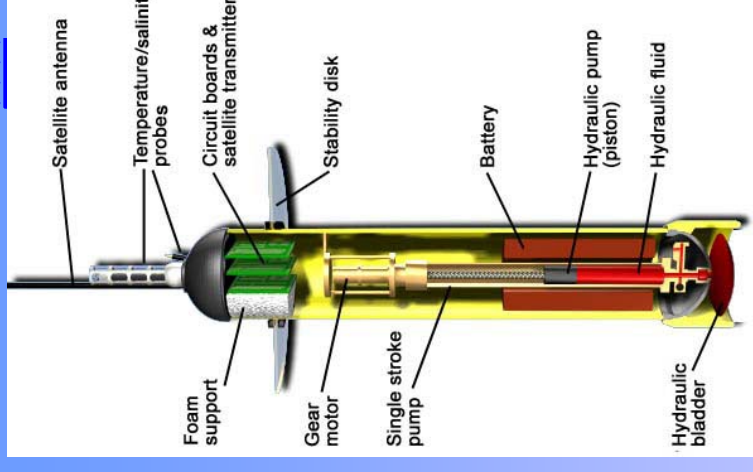


Andreas Sterl: Argo Project, NIOZ, 05.04.2006  
➤ **10 Days Cycles**

## Float Technology: complex & “revolutionary”



- Float designs APEX, PROVOR, SOLO, NINJA, COPEX, NEMO
- 150-200 cycles (4-5 years lifetime)
- T/S Profiles down to 2000 dbars
- CTD stable: 1 dbar, 0.001 °C, 0.01 PSU
- Air/Ship Deployments
- Argos Communications

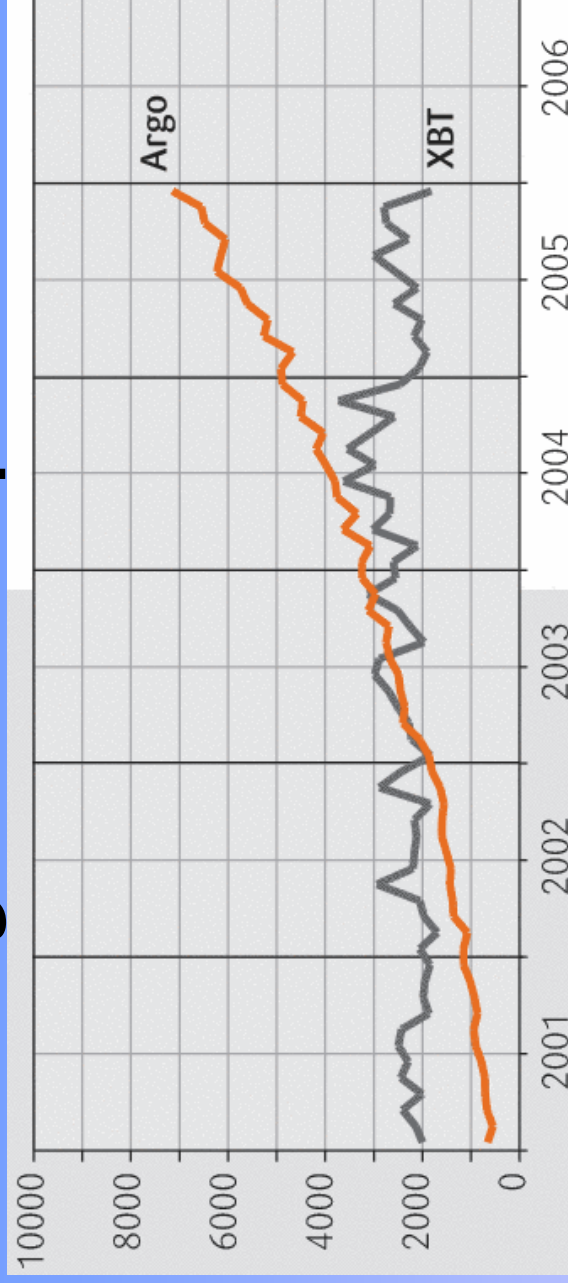


- *Optical, Acoustic, Dissolved Oxygen sensors ...*
- *Iridium communications*
- *Next generation profiling floats (IFREMER, JAMSTEC)*

## ➤ **Technological Challenge**

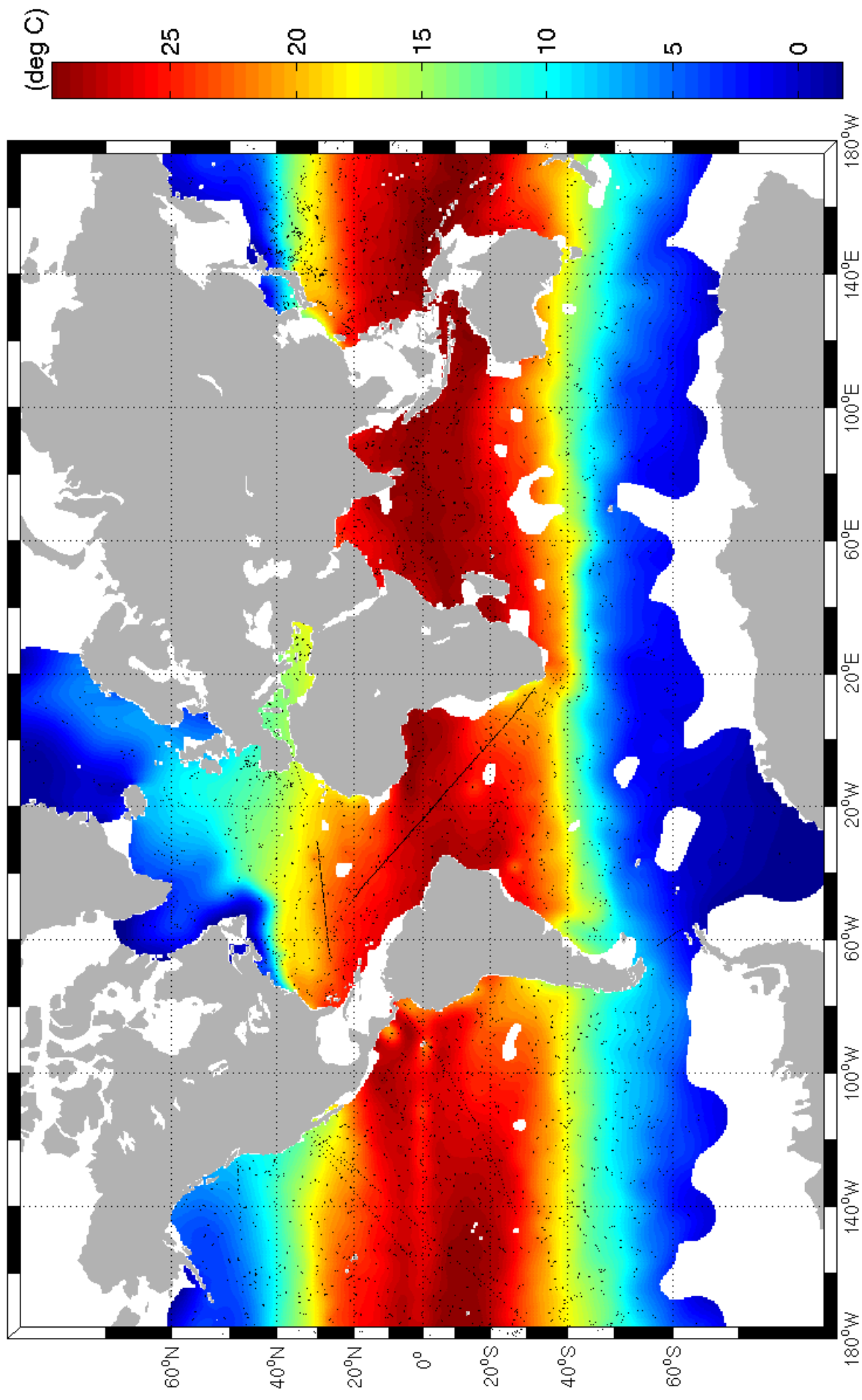
## Number of profiles

- more Argo than XBT profiles:



- better spatial coverage
- more Argo profiles from Southern Ocean than obtained ever before
- price per profile < \$200,-

Temperature analysis (deg C) – Depth 10 m – 31-Mar-2006



**Coriolis**

min = -1.92 max = 30.19 Last update : 31-Mar-2006

## Organization

National programmes contributing to:

- GODAE/CLIVAR pilot-project
- A major contribution to GOOS/GCOS
- Endorsed by WMO and IOC
  
- Argo Steering Team
- Argo Data Management Team

➤ Argo Project Office:

Director (*J. Gould, NOC, UK*)

Coordinator (*M. Belbeoch, Argo Information Centre - JCOMMOPS,*

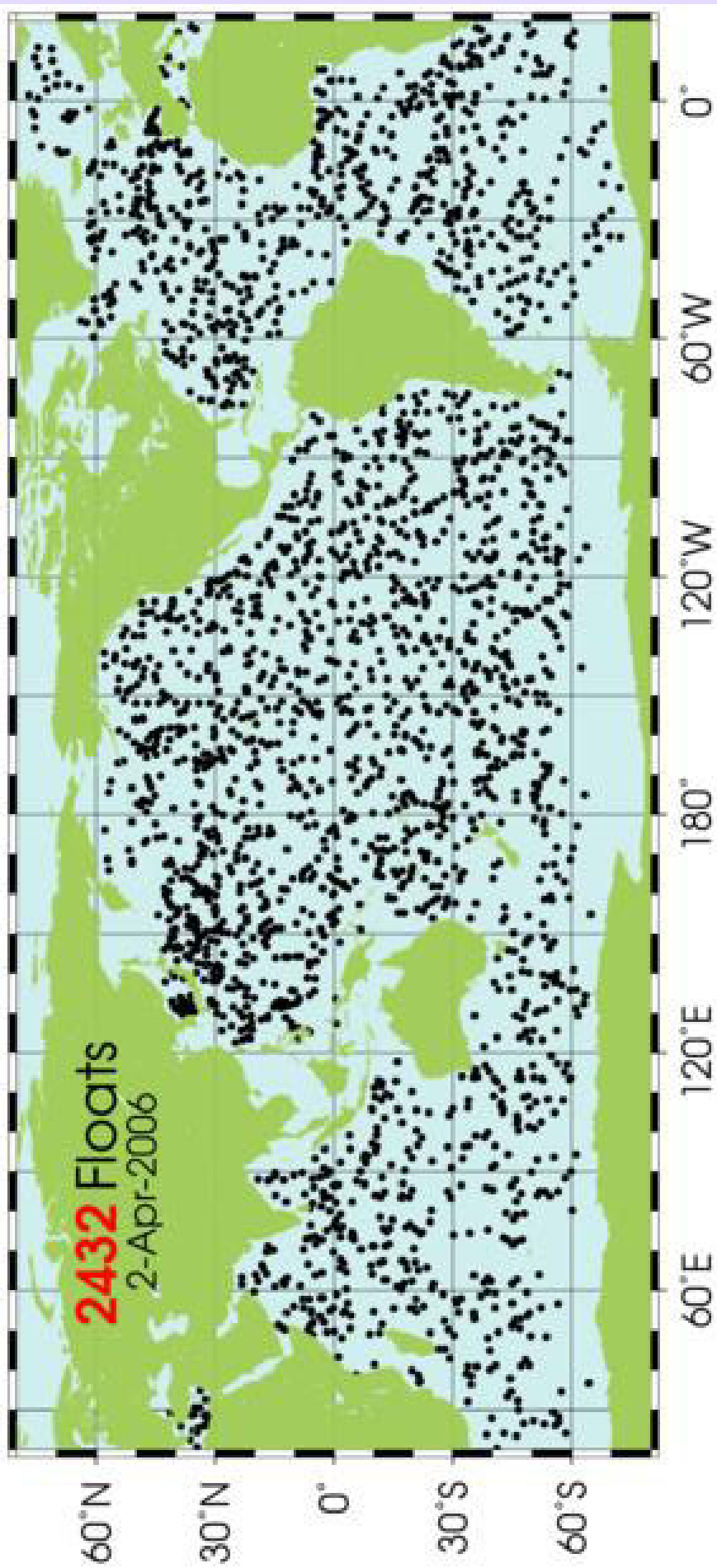
*Toulouse, France*)



## Data Management



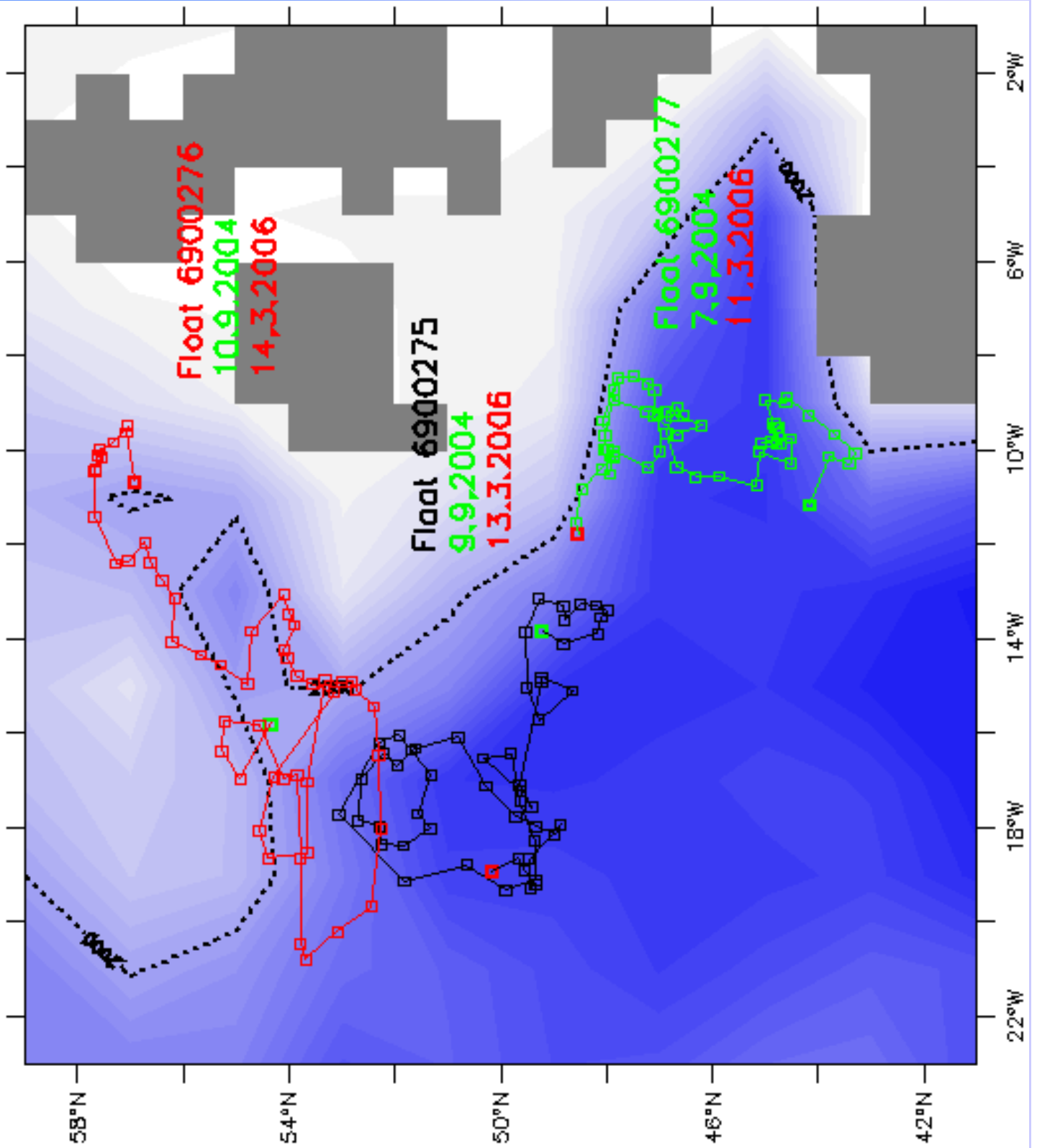
- 2 channels of real time distribution:
  - GTS of WMO - mostly to operational users
  - Internet from 2 Global Data Centres (GDACs)
    - available to all
- GDACs : Coriolis Server (IFREMER, France)  
GODAE Server (FNMOC, USA)
- Standard Real-Time QC applied
- Delayed-Mode QC being finalized (data available from GDACs after delay of 6-12 months)
- Regional Centres being established
- Long Term Archival Centre established @ NODC, USA

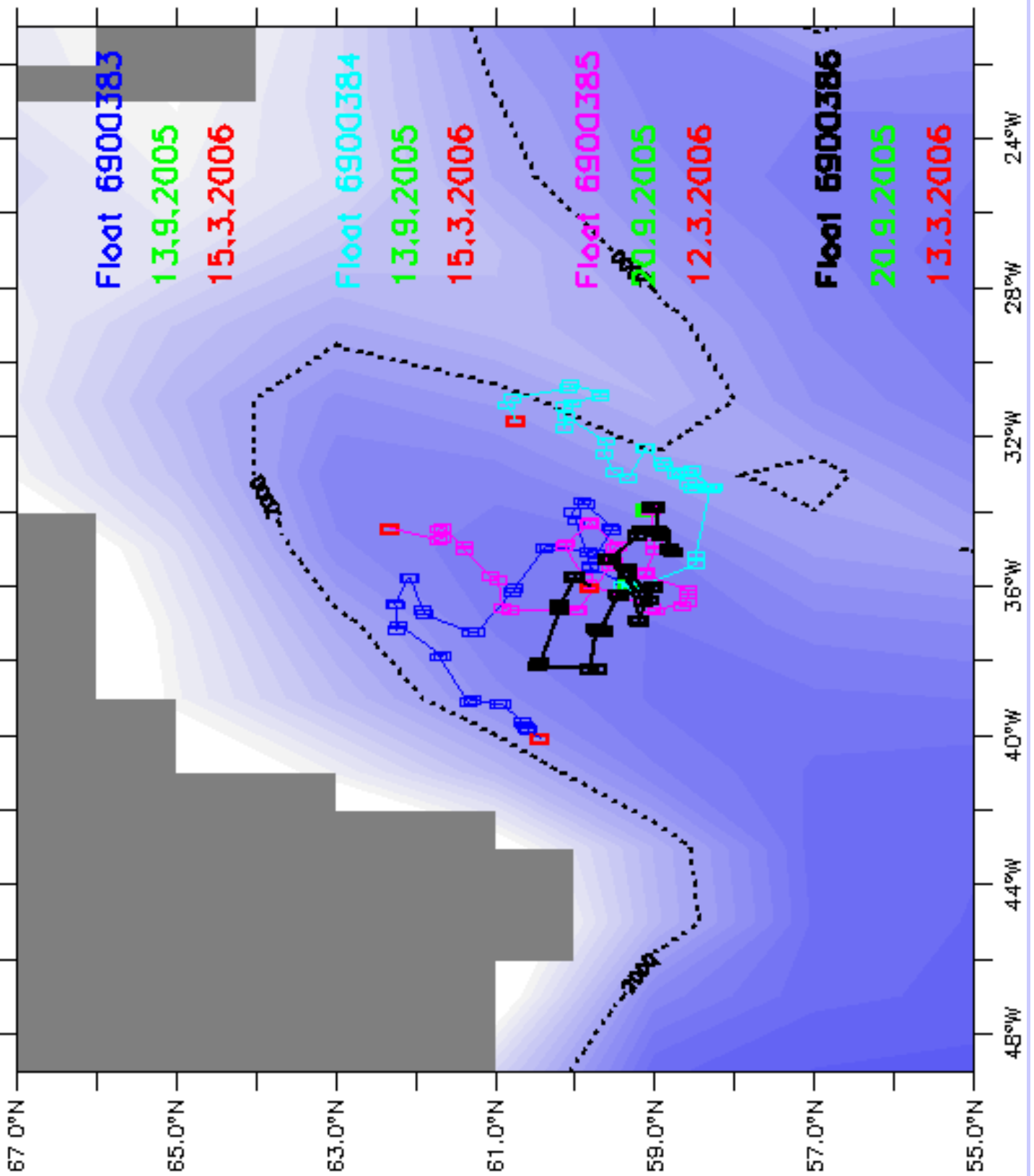




## Dutch Contribution

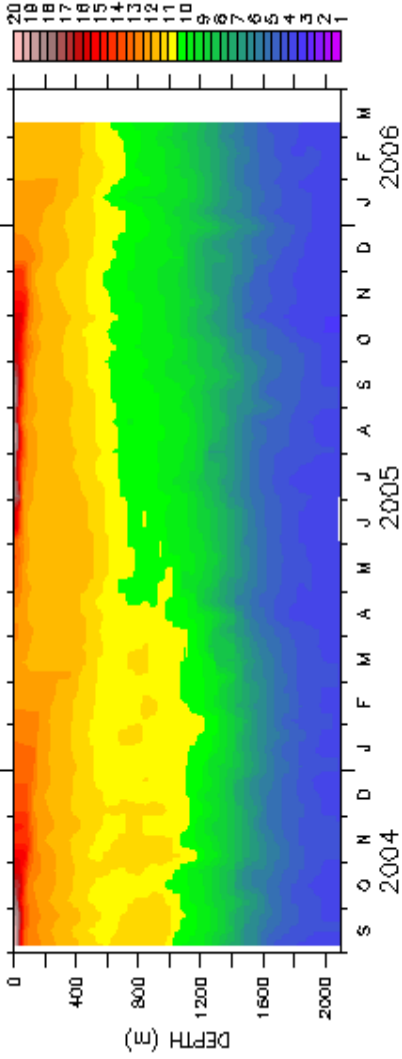
- coordination/financing by KNMI
- deployment by NIOZ:
  - 2004: 3 floats between Spain and Rockall
  - 2005: 4 floats in Irminger Sea
  - 2006: 4 floats in Canary Basin
- contribution to NARDAC



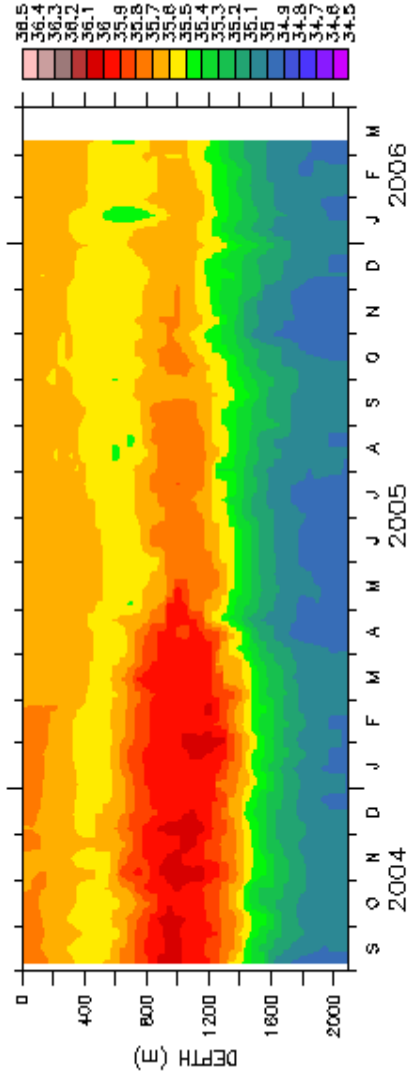




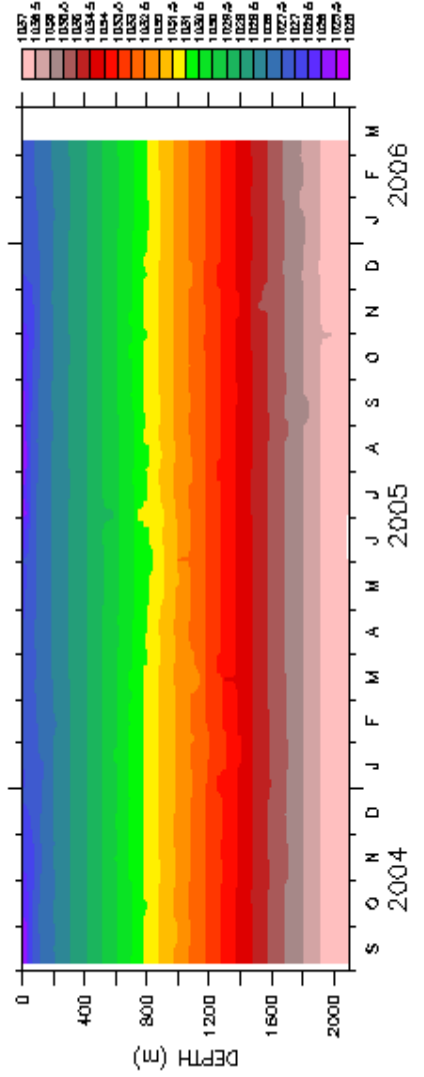
Float 6900277



Temperature



Salinity

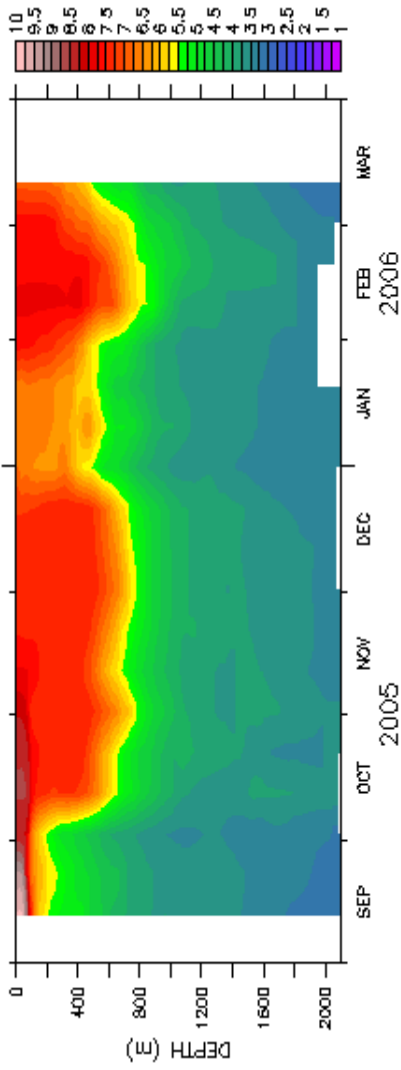


Density

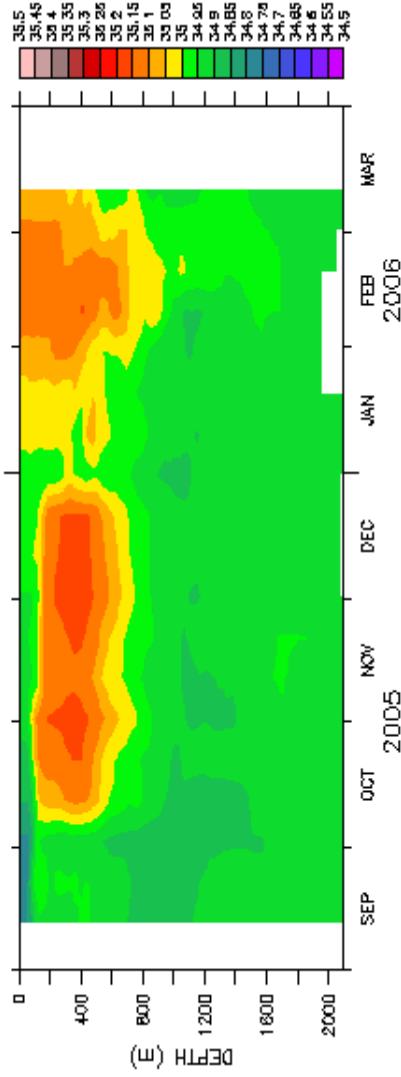




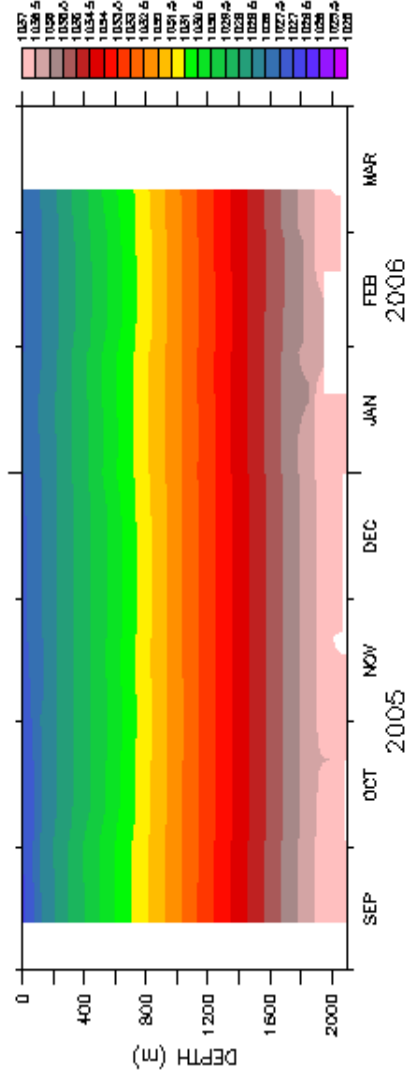
Float 6900384



Temperature



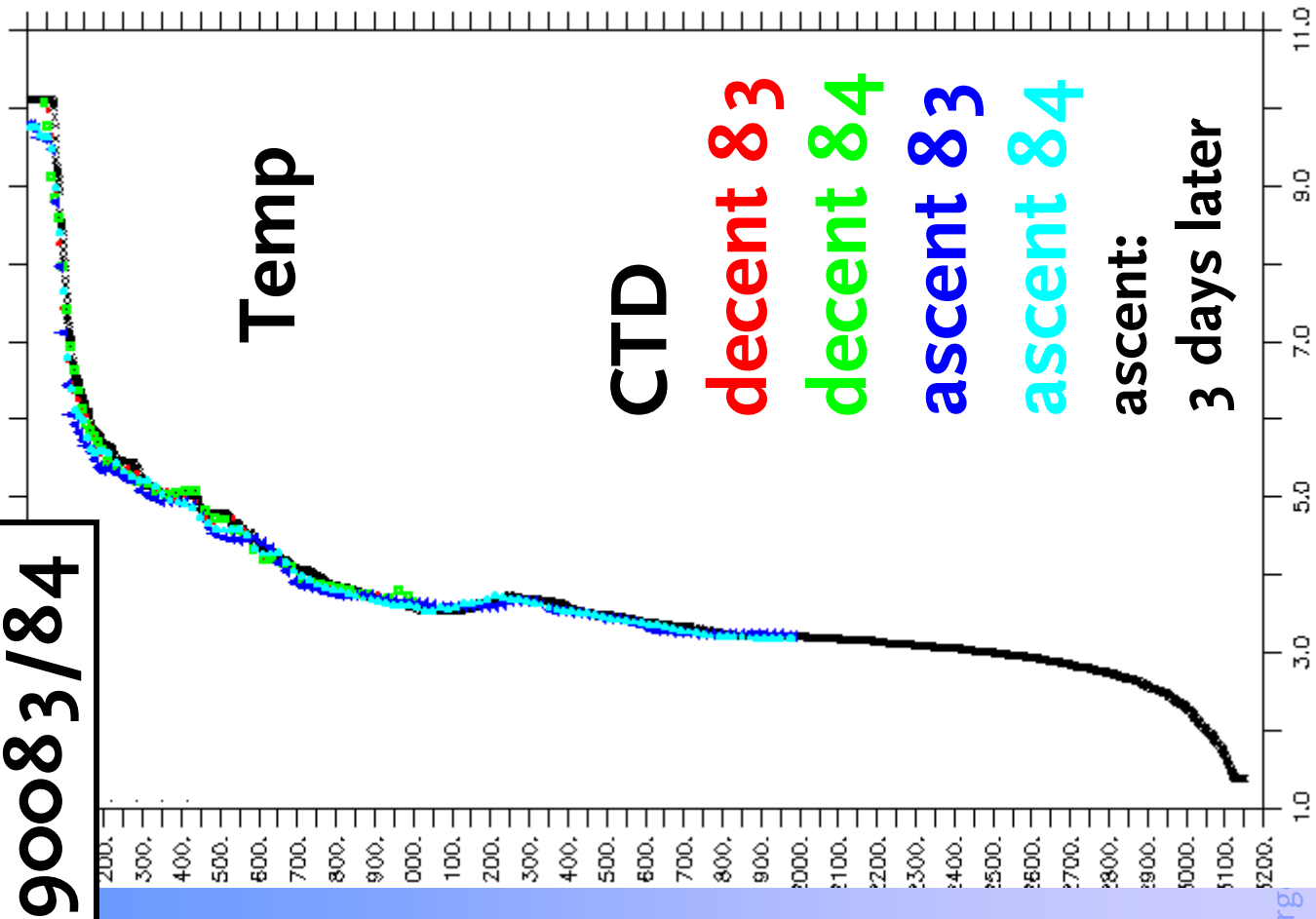
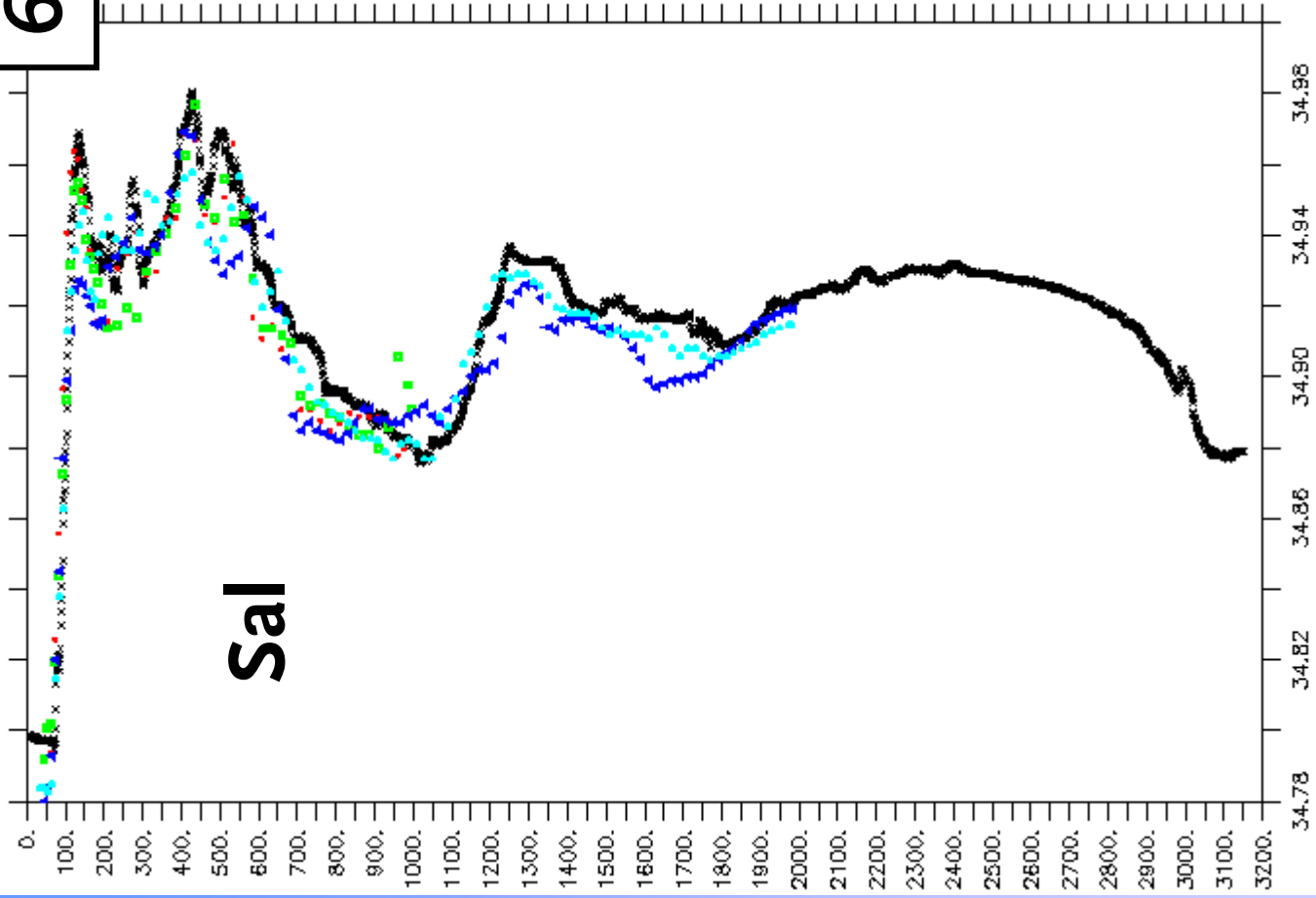
Salinity

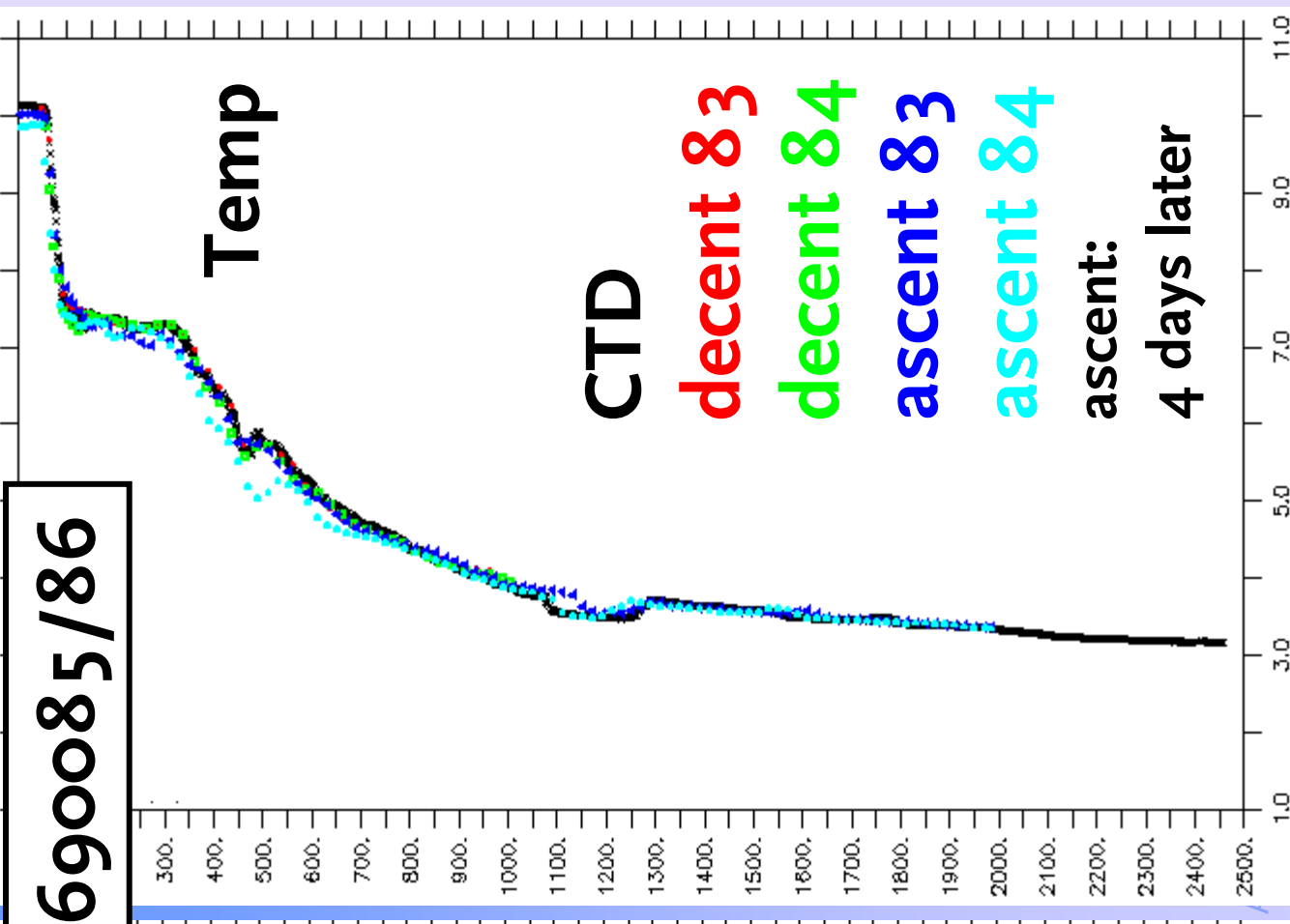
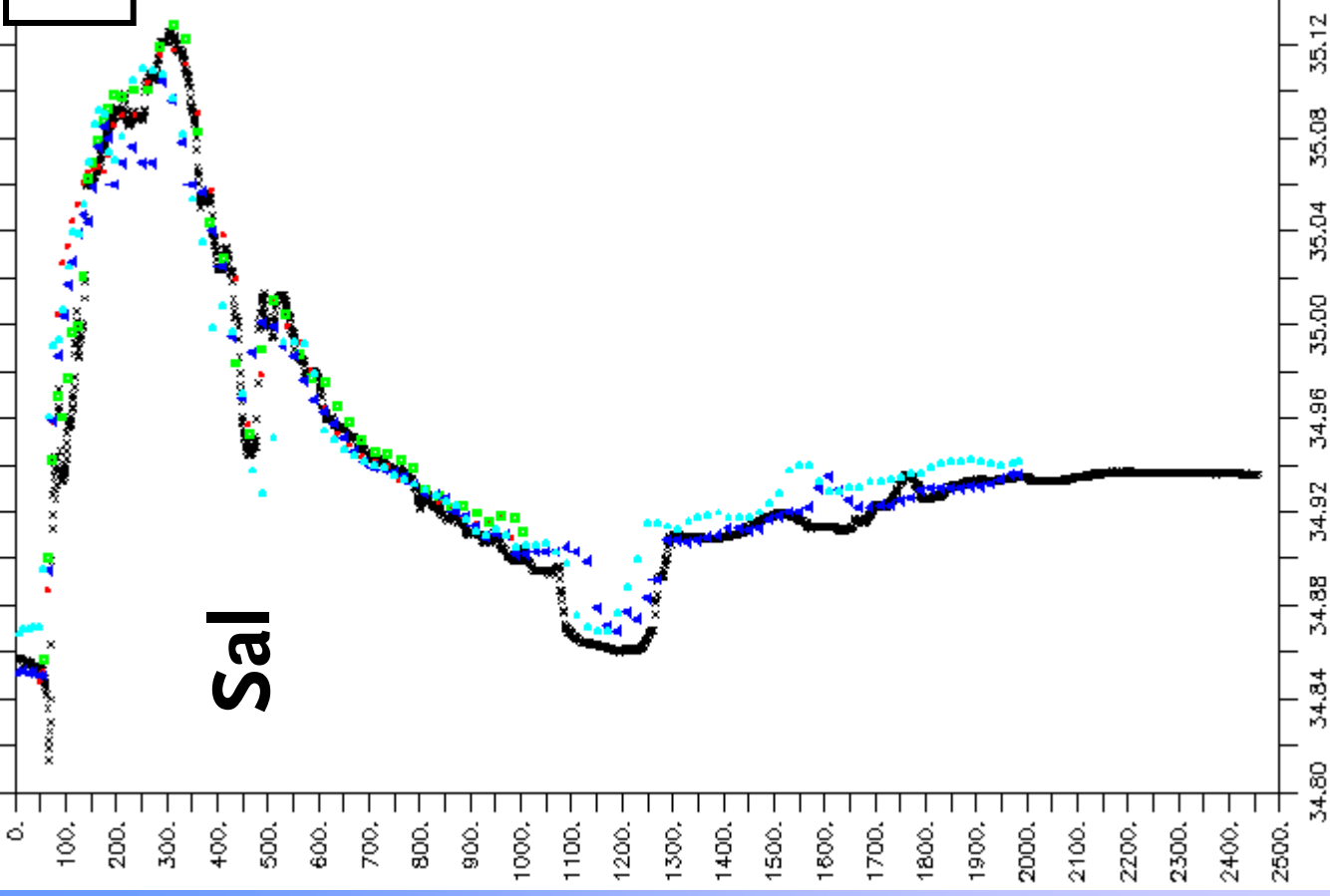


Density



690083/84





**690085/86**

**CTD**

**descent 83**

**descent 84**

**ascent 83**

**ascent 84**

**ascent:**

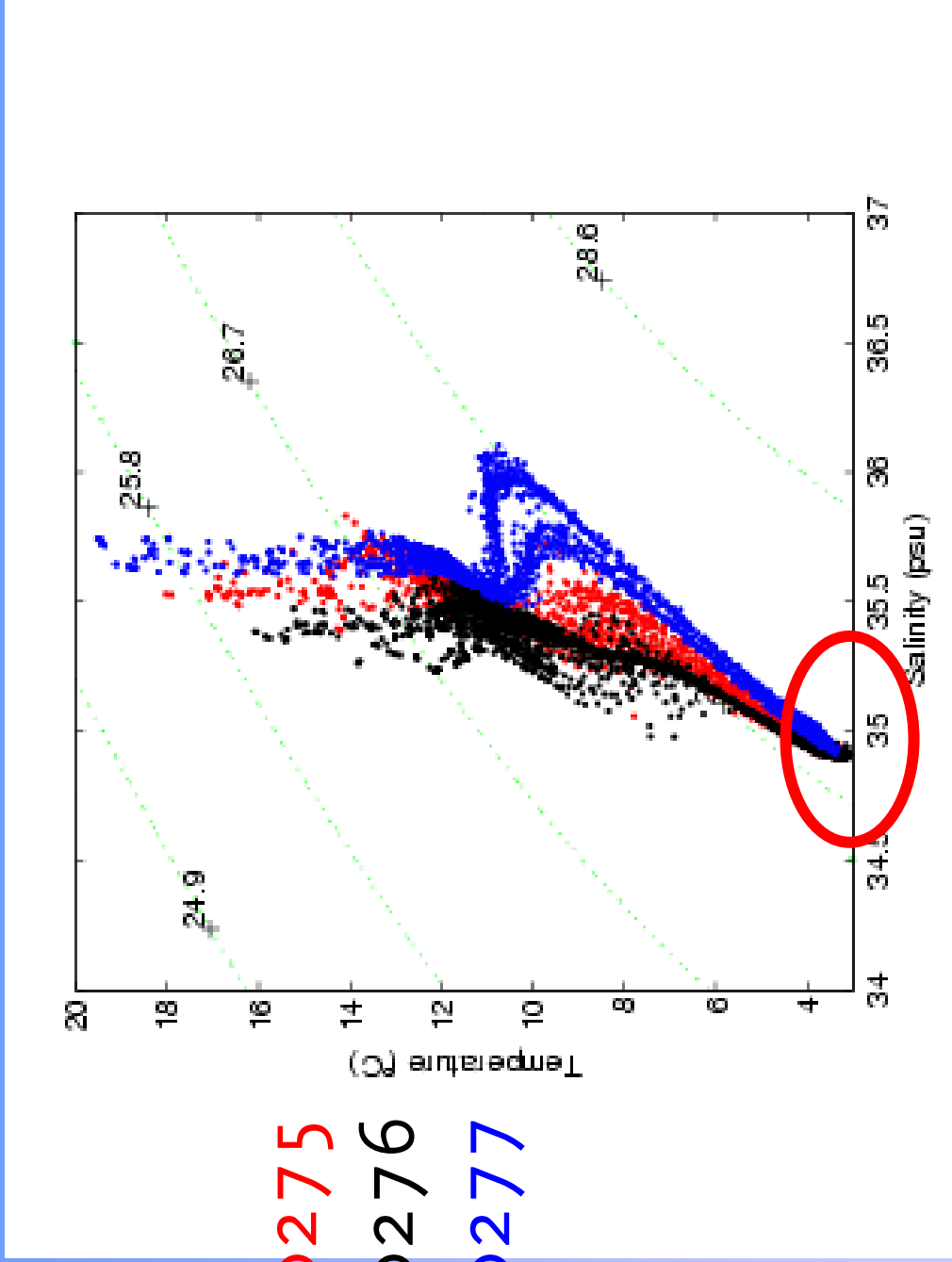
**4 days later**

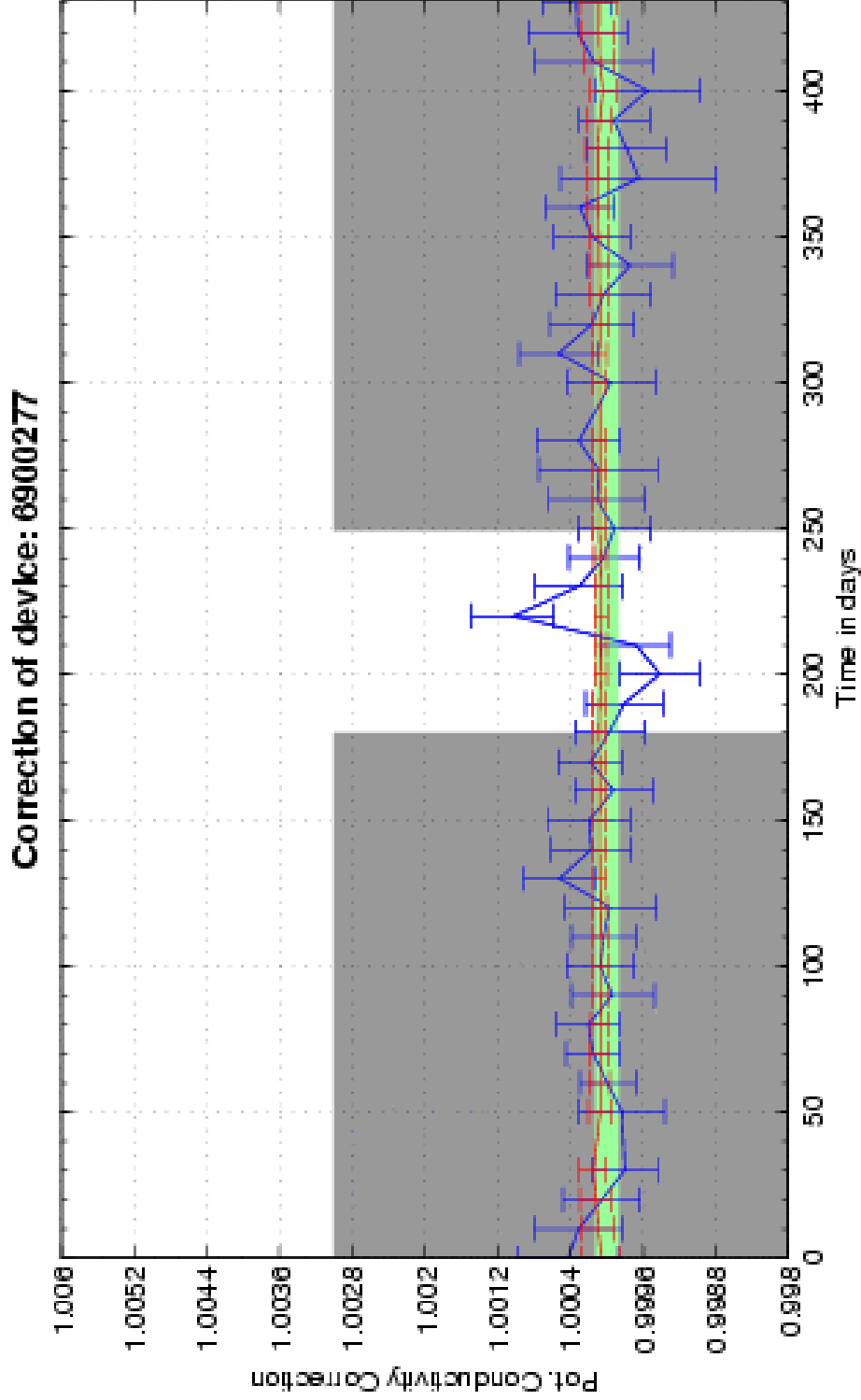
## Delayed-Mode Quality Control

- Problem: Sensor drift (Conductivity)
- Look for internal consistency
- Compare with “conventional” data in vicinity (space and time) – **availability important!!**
- Try to detect and remove drift

# ••• T-S-diagram

6900275  
6900276  
6900277







# Argo III

