Coriolis data-centre
an in-situ data portail for operational oceanography

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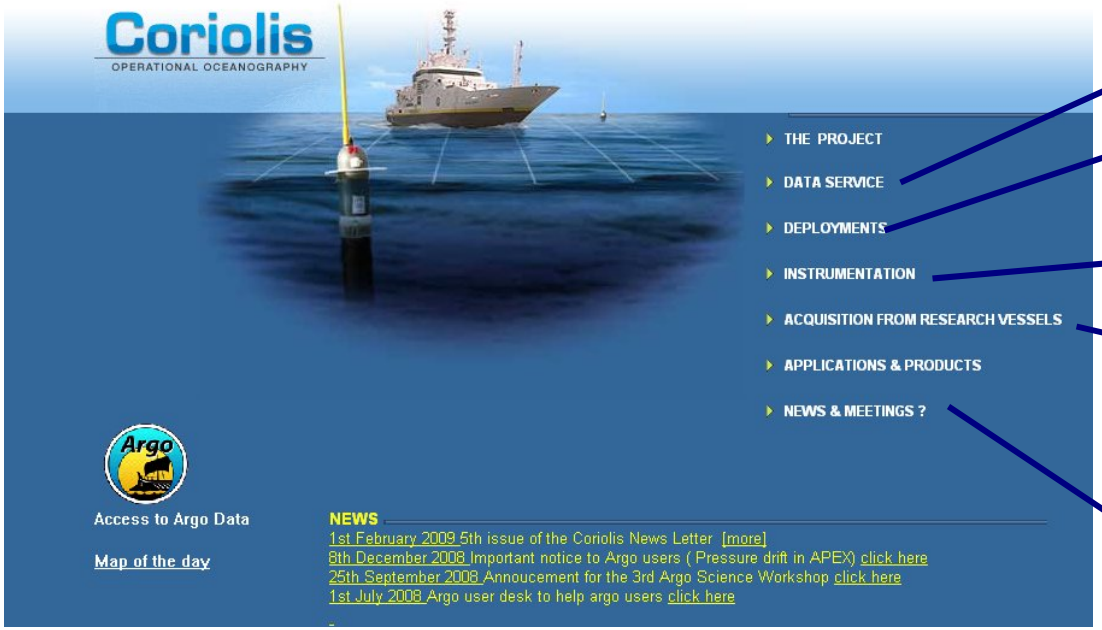
How did Coriolis start to work on operational oceanography?



Data centre

Floats deployments

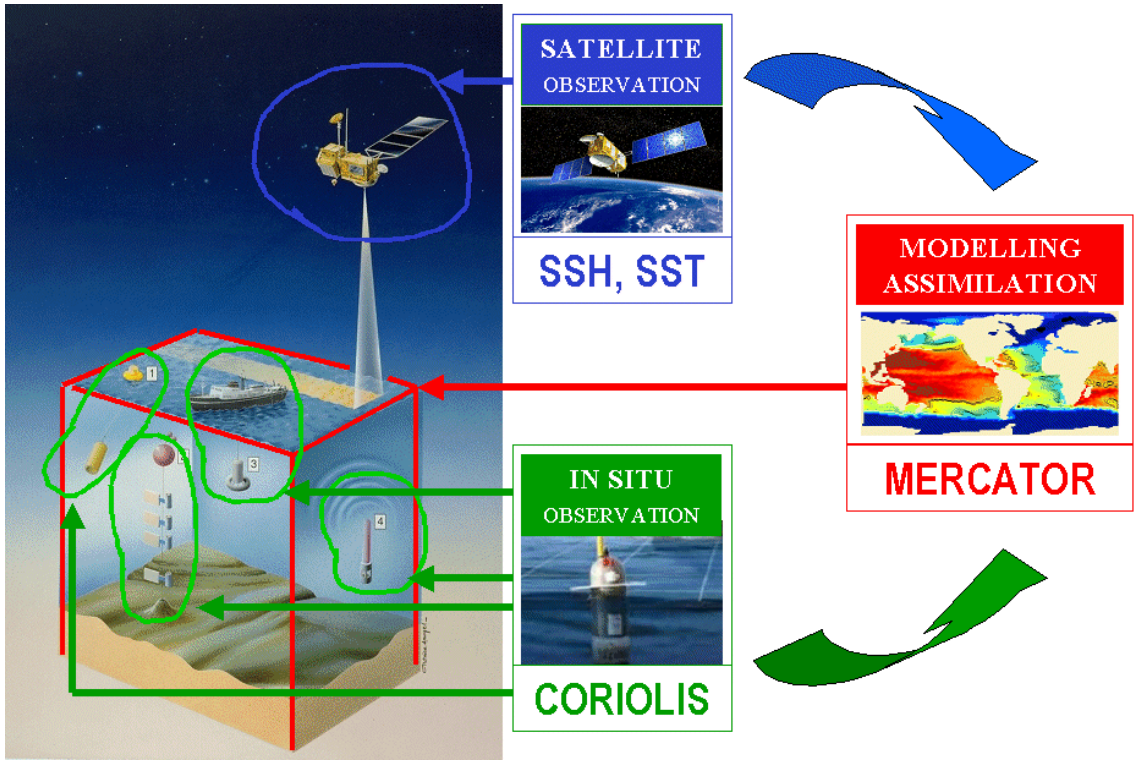
Instrumentation

Research vessels operations

Science

The Coriolis data centre is operated by Sismer (Ifremer) which acts as the french NODC

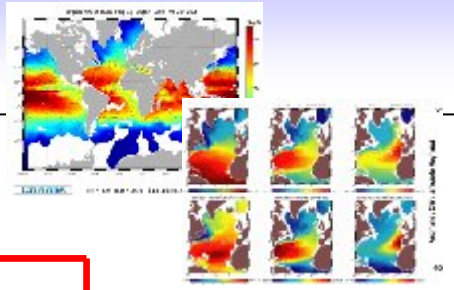
- An Operational Oceanography system is developed in France to monitor, understand and predict the Ocean dynamics :
  - oceanic circulation models : Mercator, Mersea, MyOcean and Soap
  - satellite remote sensing : Topex-Poseidon, Envisat , Cersat...
  - in-situ observation of the Ocean : Coriolis



- Coriolis is dedicated to in-situ observations :
  - sensor and instrument developments (ie Argo floats: Provor)
  - deployments and monitoring of instruments (Argo,
  - data management (data centre)
  - expertise on observations (science advisory)

- Coriolis contributes to the development of global, automated and perennial observation network as defined by GOOS

- The main type of in-situ observations managed by Coriolis are temperature, salinity and oceanic currents, in real-time and delayed mode.



Products

IN SITU
OBSERVATION

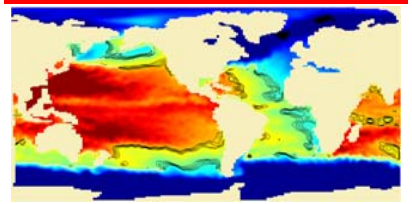
Validation

Delayed mode

Near real time

Assimilation

ASSIMILATION MODELS



Model outputs

SATELLITE
OBSERVATION

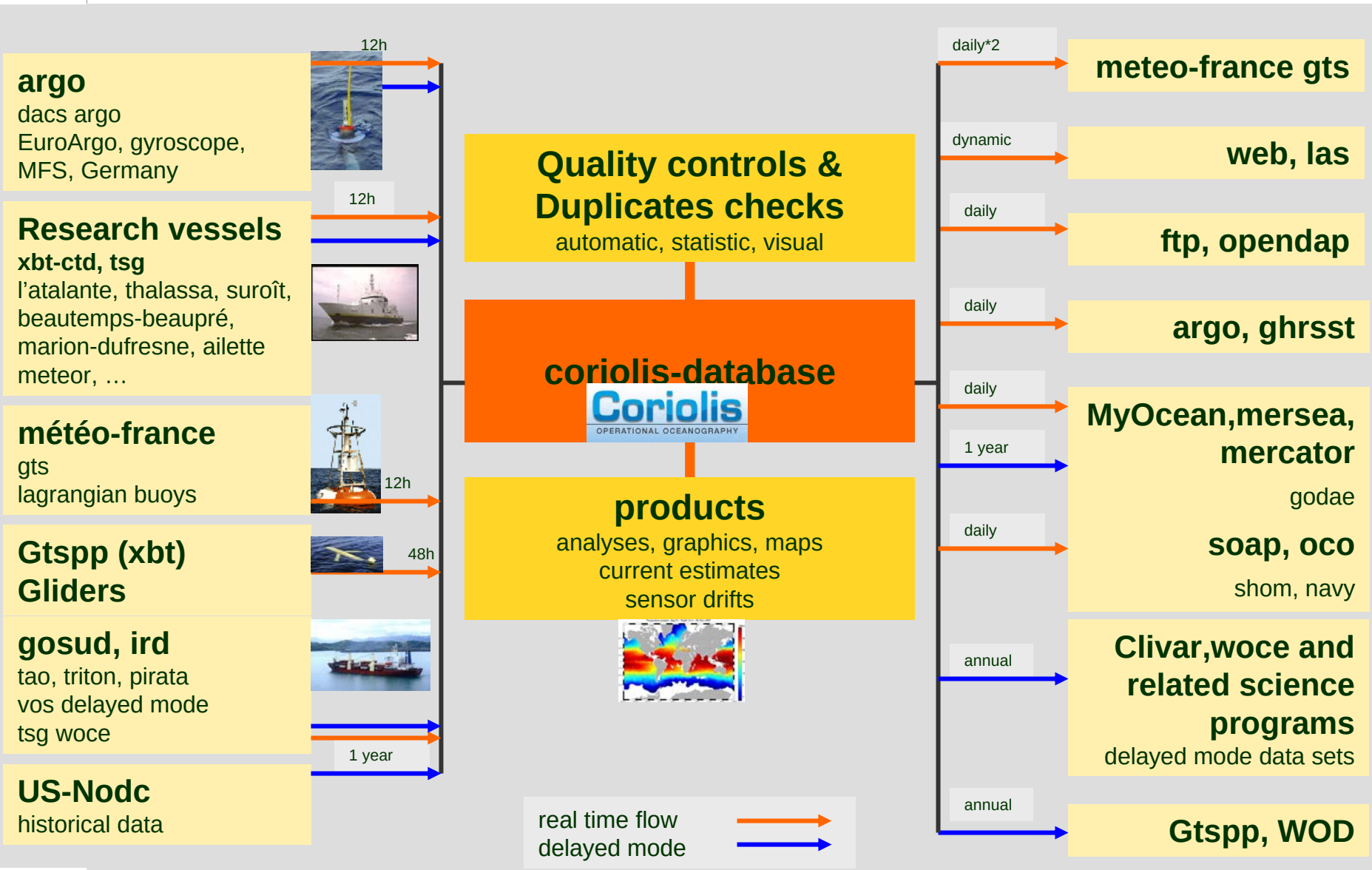
Coriolis aims to be a one-stop shopping for ocean in-situ data:

- near real-time (assimilation)
- delayed-mode (validation)

Considering the previous scheme, a ocean data centre dedicated to operational oceanography should be able to provide the following functions

- Collect the data from various sources
- Distribute the quality controlled datasets
  - In near-real time (assimilation)
  - In delayed-mode (validation)
- Monitor the observing network by providing tools
- Elaborate and distribute value added products

Coriolis data flow

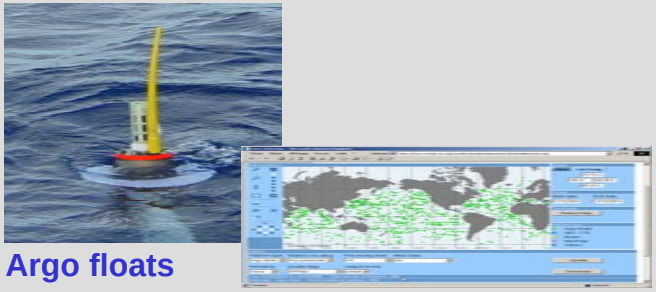


Main data sources

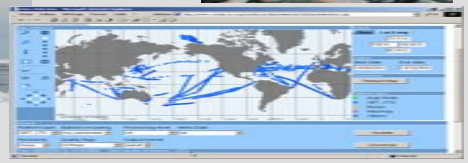
- Argo floats
  - Coriolis acts as both National DAC and GlobalDAC
  - 3200 floats
  - data management (data centre)
  - expertise on observations (science advisory)
- Data from vessels
  - Research vessels and merchant ships
  - XBT,CTD
  - ADCP
  - TSG (SSS & SST). GOSUD project
- Moorings
  - Open Ocean or Coastal moorings
  - OceanSites & EuroSites
- Surface Drifters
  - Mostly for national needs or projects in partnerhip
- Gliders

- Links from the GTS

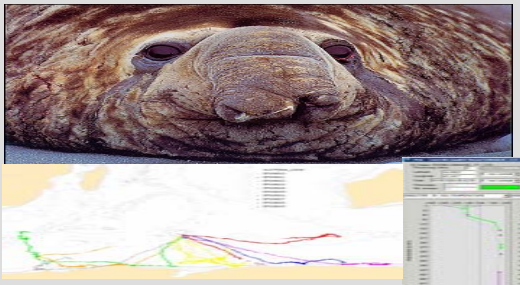
Data sources

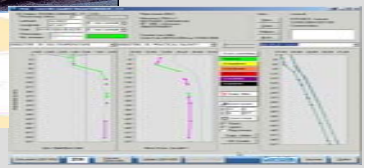


Argo floats

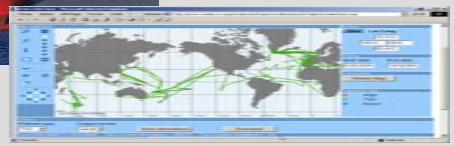


Oceanographic vessels

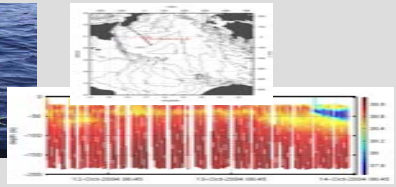




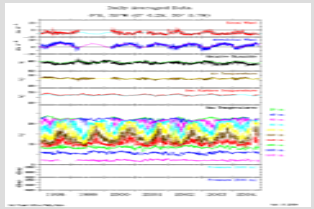
Sea elephants



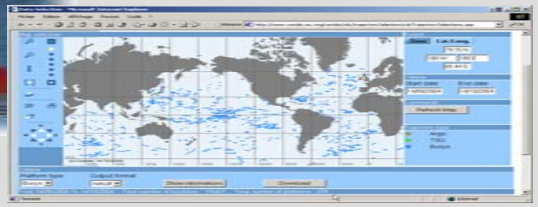
Commercial ships



Gliders

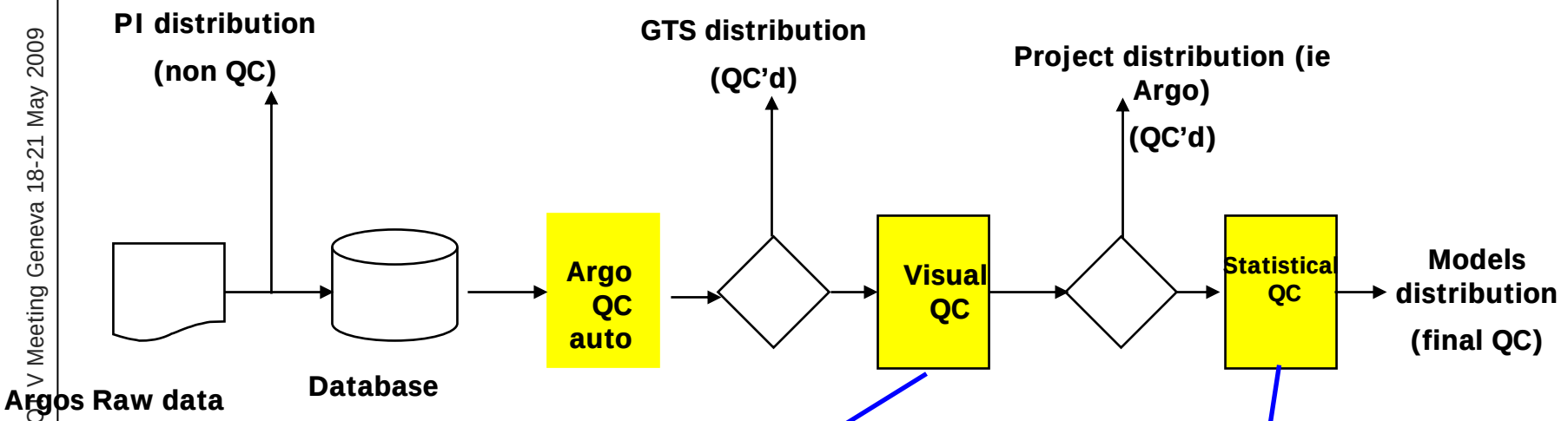


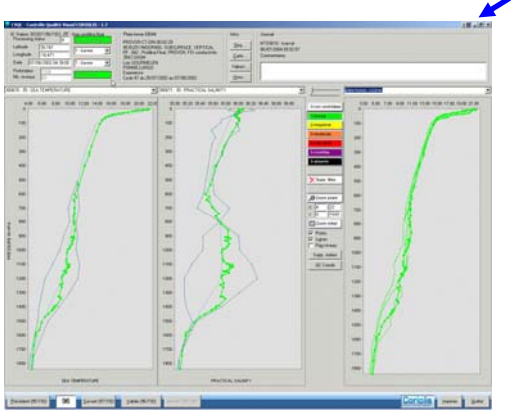
Fixed buoys

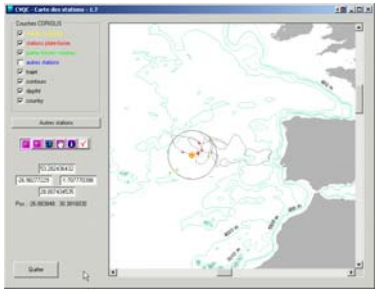


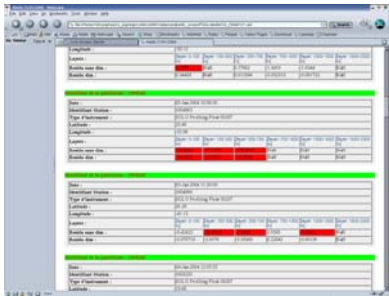
Drifting buoys

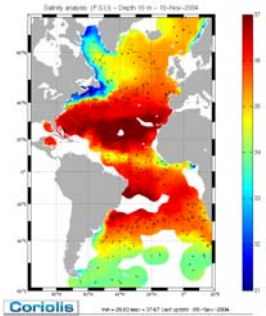
Data flow for real time QC at Coriolis









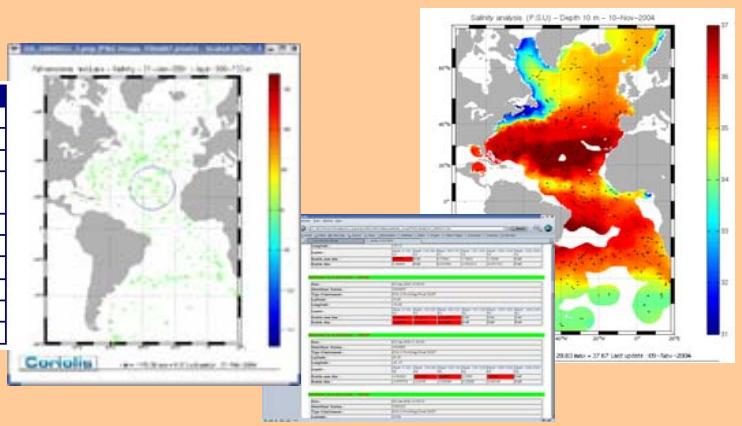


Coriolis Quality Control documentation procedures

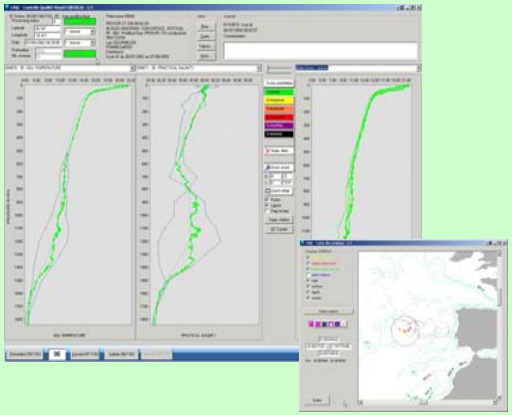
Real-time : Argo automatic controls

1. Platform Identification
2. Impossible Date Test
3. Impossible Location Test
4. Position on Land Test
5. Impossible Speed Test
6. Global Range Test
7. Regional Range Test
8. Pressure Increasing Test
9. Spike Test
11. Gradient Test
12. Digit Rollover Test
13. Stuck Value Test
14. Density Inversion
15. Grey List
16. Gross salinity or temperature sensor dr
17. Frozen profile
18. Pressure not greater than deepest pres

Code	Meaning
0	No QC was performed
1	Good data
2	Probably good data
3	Bad data that are potentially correctable
4	Bad data
5	Value changed
6	Not used
7	Not used
8	Interpolated value
9	Missing value



Statistical controls



Visual controls

Coriolis Quality Control documentation procedures

Real-time : Argo automatic controls

1. Platform Identification
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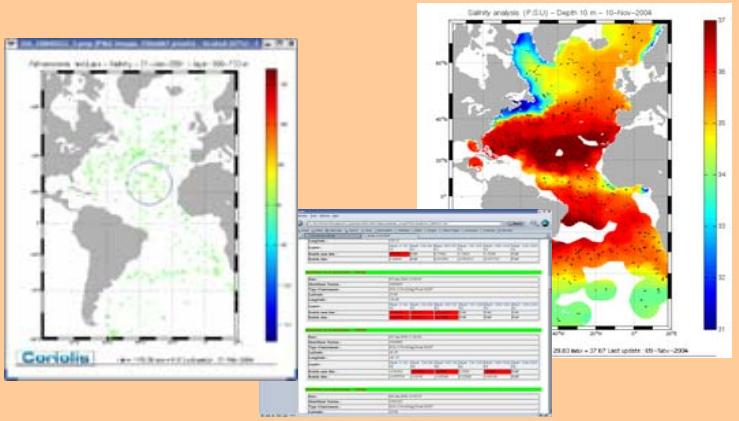
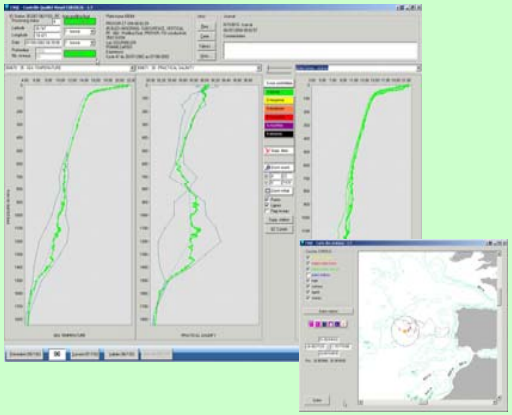


Statistical controls

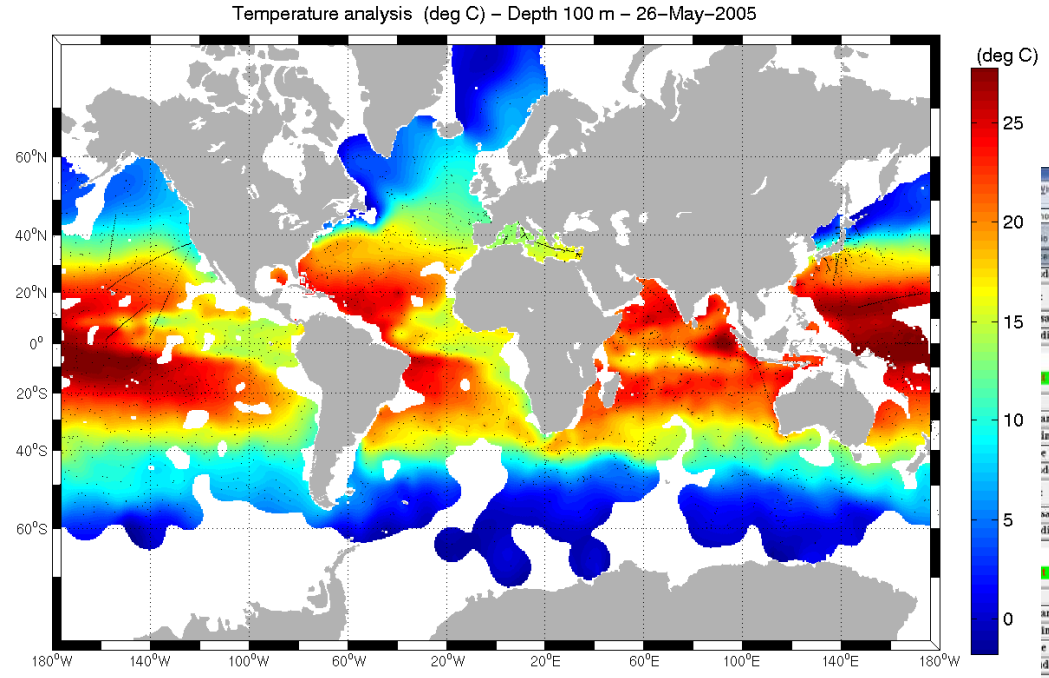


Visual controls

Real time QC : automatic & statistical

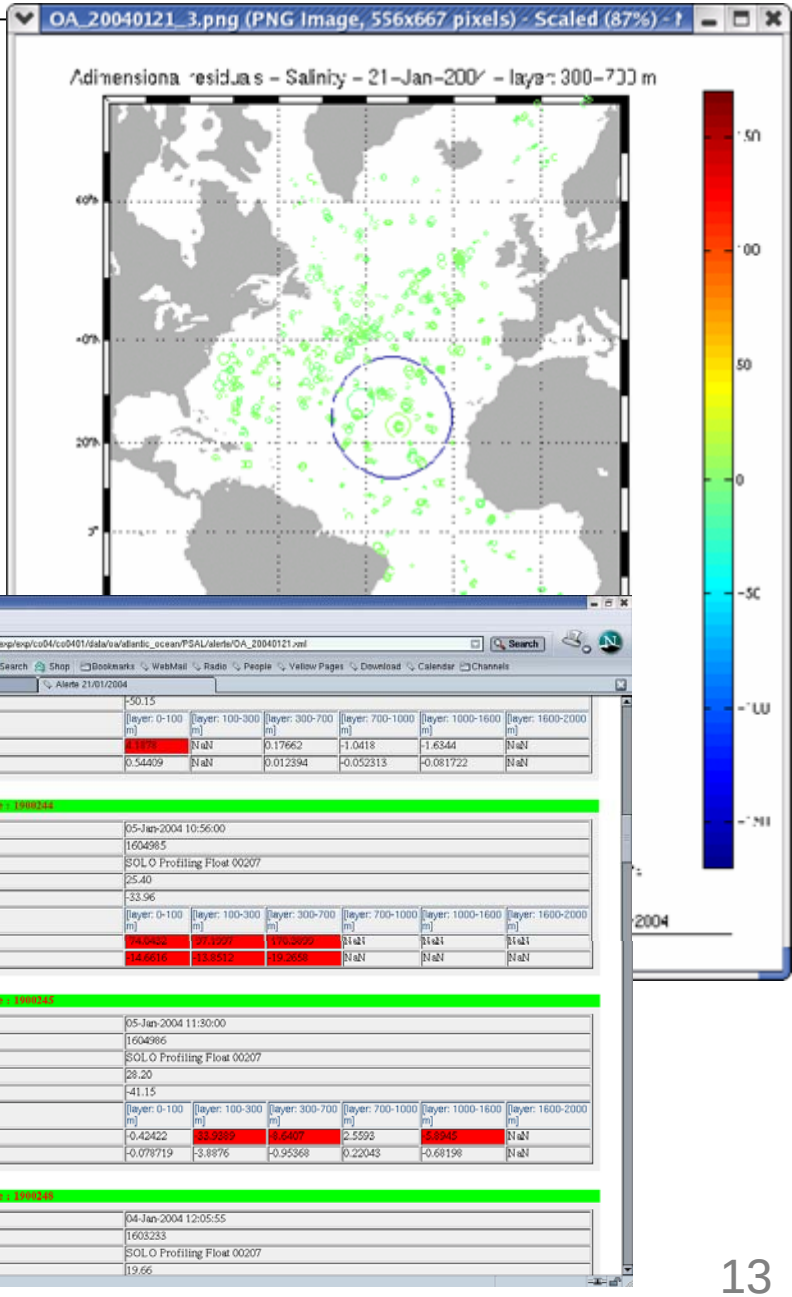
- International standard for automatic QC (ARGO/GOSUD)
- Global analysis of temperature and salinity : use mapping residuals to detect outliers

18-21 May 2009

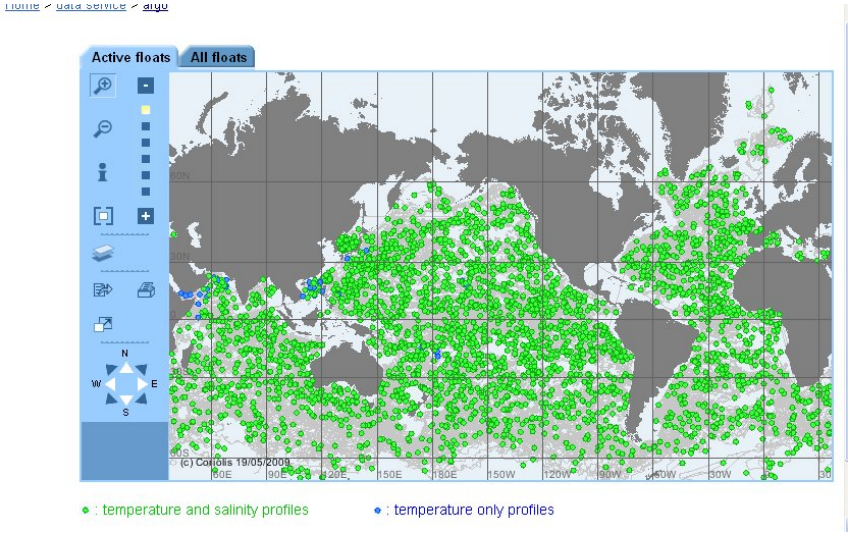


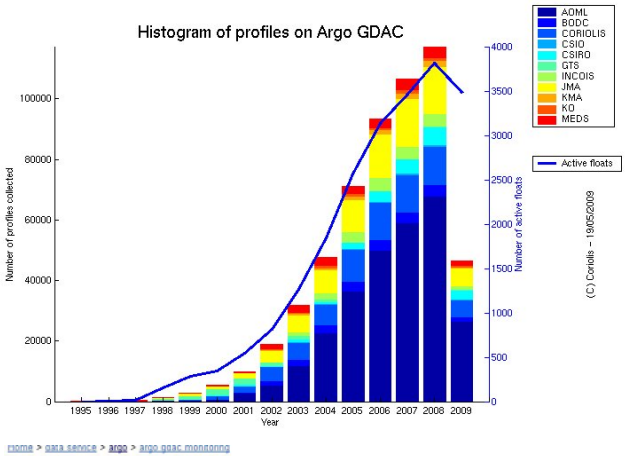
Coriolis

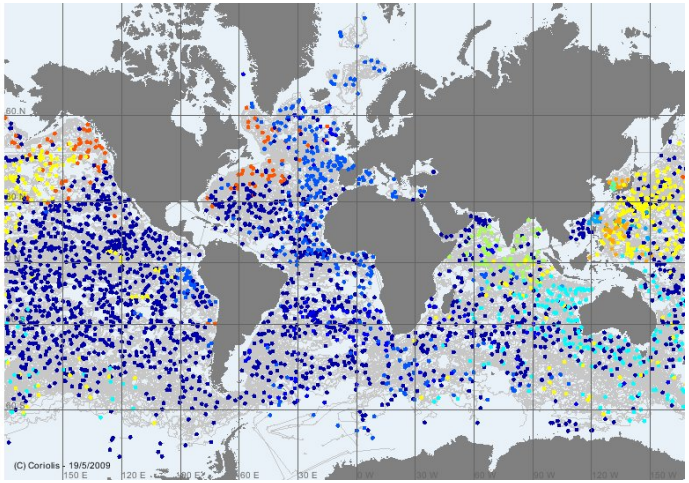
min = –1.87 max = 28.85 Last update : 26–May–2005

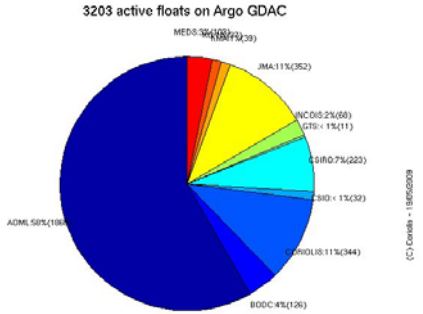


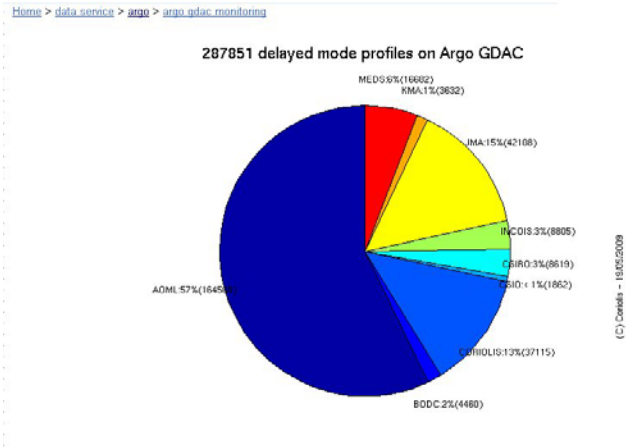
Argo network (1 week of data)



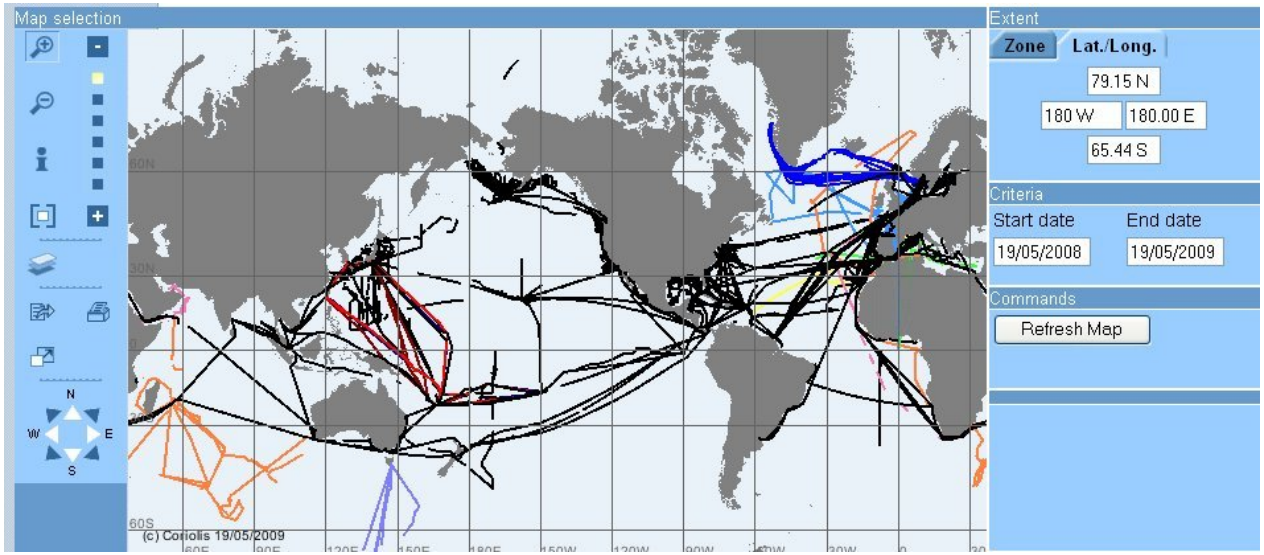








Sea Surface Salinity



From 19/05/2008 To 19/05/2009 total of 70 platforms and 1170181 locations	
C6VL5 - MATISSE	Number of locations : 550
KS004 - SEAKEEPERS 004	Number of locations : 1361
KS081 - SEAKEEPERS 081	Number of locations : 540
SHIP - UNIDENTIFIED PLATFORM	Number of locations : 5535
VHW5167 - UNKNOWN SHIP	Number of locations : 36227
KS027 - SEAKEEPERS 027	Number of locations : 64
KS062 - SEAKEEPERS 062	Number of locations : 211
C6TN4 - EXPLORER	Number of locations : 36315
FNIN - MARION DUFRESNE	Number of locations : 122238
JCCX - CHITA MARU	Number of locations : 492
JGQH - RYOFU MARU	Number of locations : 182
JIVB - SEIFU MARU	Number of locations : 230
JPBN - KEIFU MARU	Number of locations : 107
KS049 - SEAKEEPERS 049	Number of locations : 1022
KS052 - SEAKEEPERS 052	Number of locations : 1255
MGJS8 - NOKWANDA	Number of locations : 5768
WTEE - OSCAR ELTON SETTE	Number of locations : 11191
WTEO - RELENTLESS	Number of locations : 28894
WTEP - OCEANOGRAPHER	Number of locations : 58868
FABB - BEAUTEMPS-BEAUPRE	Number of locations : 20230
FHZI - L'ASTROLABE	Number of locations : 1162
KS007 - SEAKEEPERS 007	Number of locations : 1371

KS056 - SEAKEEPERS 056	Number of locations : 52
WTDK - DAVID STARR JORDAN	Number of locations : 23943
KS078 - SEAKEEPERS 078	Number of locations : 676
DAJC - MONTE OLIVIA	Number of locations : 5582
FMCY - POURQUOI PAS?	Number of locations : 63455
FNFP - THALASSA	Number of locations : 91212
JDSS - HAKUHO-MARU	Number of locations : 1972
KS011 - SEAKEEPERS 011	Number of locations : 811
KS055 - SEAKEEPERS 055	Number of locations : 928
KS059 - SEAKEEPERS 059	Number of locations : 91
OXYH2 - NUKA ARCTICA	Number of locations : 5779
PJJU - OLEANDER	Number of locations : 35225
KS067 - SEAKEEPERS 067	Number of locations : 1232
KS071 - SEAKEEPERS 071	Number of locations : 28
KS073 - SEAKEEPERS 073	Number of locations : 67
KS079 - SEAKEEPERS 079	Number of locations : 138
3ENY2 - SOUTH ISLANDER	Number of locations : 2592
3EVS - SOUTH ISLANDER	Number of locations : 2347
3FEW5 - KYOWA CATTLEYA	Number of locations : 2804
FNAV - MN TOUCAN	Number of locations : 2874
FZVN - LE SUROIT	Number of locations : 89935
HORQ - CORAL ISLANDER2	Number of locations : 4920
HPEW - PACIFIC ISLANDER	Number of locations : 970
KS060 - SEAKEEPERS 060	Number of locations : 537

KS084 - SEAKEEPERS 084	Number of locations : 48
VLHJ - SOUTHERN SURVEYOR	Number of locations : 112228
WTEY - HECK	Number of locations : 9265
KS034 - SEAKEEPERS 034	Number of locations : 167
KS074 - SEAKEEPERS 074	Number of locations : 141
DJOK - BARBARA	Number of locations : 2980
WTDM - MILLER FREEMAN	Number of locations : 22157
KS043 - SEAKEEPERS 043	Number of locations : 169
KS064 - SEAKEEPERS 064	Number of locations : 124
EDSV - CORNIDE DE SAAVEDRA	Number of locations : 252733
FNCM - L'ATALANTE	Number of locations : 56717
HOWN - PACIFIC ISLANDER2	Number of locations : 3185
JDWX - KOFU MARU	Number of locations : 306
KS008 - SEAKEEPERS 008	Number of locations : 686
WTDO - OREGON II	Number of locations : 15523
KS077 - SEAKEEPERS 077	Number of locations : 204
5BAD2 - MATISSE	Number of locations : 3144
A8IG2 - CMA CGM LAVENDER	Number of locations : 2934
DBFO - SEEFALKE	Number of locations : 548
DBKV - POSEIDON	Number of locations : 4011
FNHO - COLIBRI	Number of locations : 2785
WTER - MALCOLM BALDRIDGE	Number of locations : 7697

Data distribution: in near real time

PREV. UP NEXT

- mercator weekly distributio
- mersea global ftp distributic
- moon ftp distribution
- opendap-dods distribution
- live access server
- google earth
- global dataset release 2007
- global dataset release 2008

Home > data service

- Mersea global distribution : ftp://ftp.ifremer.fr/ifremer/coriolis/mersea
  Everyday, all new profiles, trajectories and time series controlled by Coriolis are distributed.
  More on Mersea global in-situ distribution.

  Mersea assesment distribution : ftp://ftp.ifremer.fr/ifremer/coriolis/mersea-assesment
  Two files per day of observation, per ocean, per type (profile ou trajectory), per instrument (float, xbt, ctd, mooring, bathy or tesac message). Observations are at least 5 days old.

- SEPRISE distribution : ftp://ftp.ifremer.fr/ifremer/coriolis/seprise
  On a daily basis, all data available for european seas are distributed in the common format described in the User Manual. The naming convention is the same as for Mersea

- Moon data distribution : ftp://ftp.ifremer.fr/ifremer/coriolis/moon
  On a daily basis, all Mediterranean data available are distributed.
  More on the Mediterranean Moon distribution

- Mercator weekly distribution : ftp://ftp.ifremer.fr/ifremer/coriolis/mercator
  Coriolis data-center distributes every Tuesday at 18:00pm (UT) all the vertical profiles controlled during the week.
  More on Mercator weekly distribution.

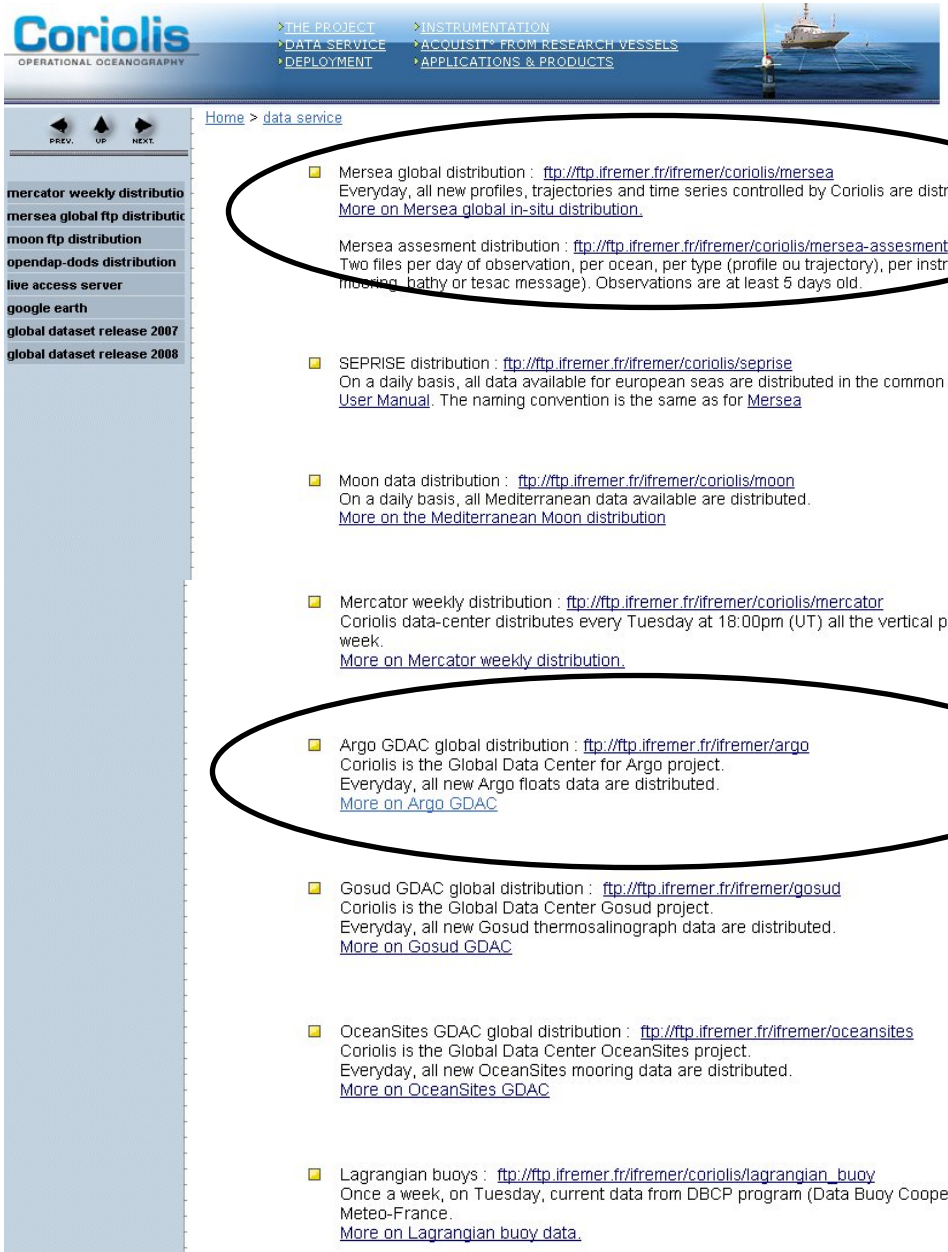
- Argo GDAC global distribution : ftp://ftp.ifremer.fr/ifremer/argo
  Coriolis is the Global Data Center for Argo project.
  Everyday, all new Argo floats data are distributed.
  More on Argo GDAC

- Gosud GDAC global distribution : ftp://ftp.ifremer.fr/ifremer/gosud
  Coriolis is the Global Data Center Gosud project.
  Everyday, all new Gosud thermosalinograph data are distributed.
  More on Gosud GDAC

- OceanSites GDAC global distribution : ftp://ftp.ifremer.fr/ifremer/oceansites
  Coriolis is the Global Data Center OceanSites project.
  Everyday, all new OceanSites mooring data are distributed.
  More on OceanSites GDAC

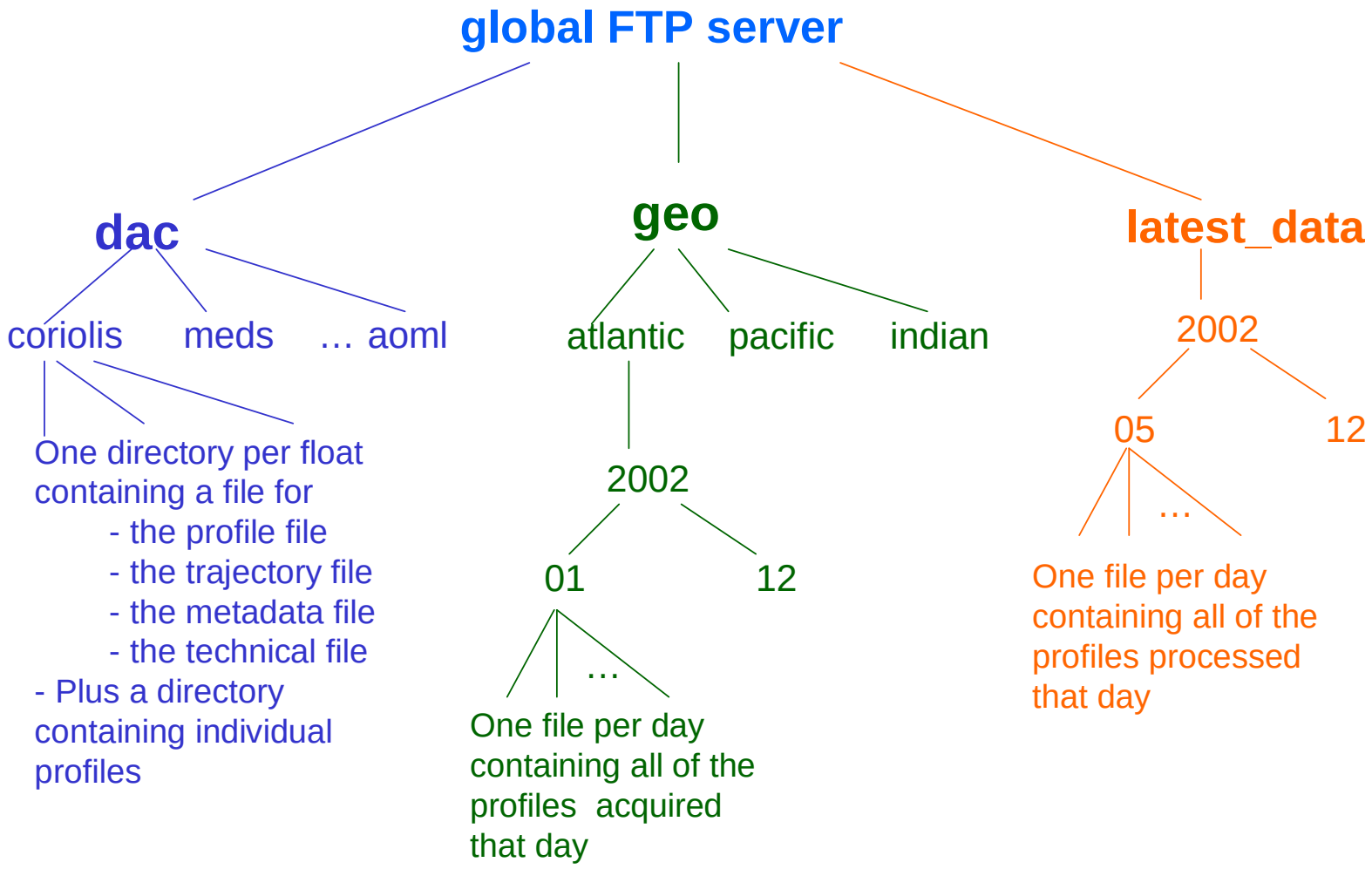
- Lagrangian buoys : ftp://ftp.ifremer.fr/ifremer/coriolis/lagrangian_buoy
  Once a week, on Tuesday, current data from DBCP program (Data Buoy Cooperation Panel) are distributed by Meteo-France.
  More on Lagrangian buoy data.

Data distribution: in near real time



Data distribution: Argo

GDAC FTP structure



Data distribution: Global in near real time

- Mersea Distribution
- All the data collected are distributed in an unique format based on Argo format
  - Vertical profiles
    - ARGO floats
    - XBT & CTD received directly from the sea
    - Bathy and Tesac from the GTS
    - Moorings directly received or not (OceanSItes)
  - Horizontal profiles
    - Sea Surface salinity and Temperature (GOSUD)
    - Times series
  - One data delivery every day on an ftp site

Mersea Distribution

Organization

- The distribution directory contains one file per day, per type of data, per ocean;
- All files that are older than 60 days are deleted.

File naming convention

- CO_YYYYMMDD_XX_YY_O.nc.gz
- CO : Coriolis bigram
- YYYYMMDD : day of distribution
- XX : TS (time series) ou PR (profiles)
- YY : data type (see below)
- O : ocean (A : Atlantic, I : Indian, P : Pacific)

Example

Measurements controlled and distributed on March 23rd 2005 :

- mersea\CO_20050324_PR_PF_P.nc.gz Pacific Argo floats data
- mersea\CO_20050324_PR_XB_A.nc.gz Atlantic XBT data
- mersea\CO_20050324_TS_TS_A.nc.gz Atlantic thermosalinograph data
- ...

File format

- Argo NetCDF profile compressed with gzip.
  This unique format is used for profiles, trajectories and time-series. In case of trajectories and time-series, profile files usually have only one level.
  All profiles are ordered in increasing chronological order.
  More on Argo NetCDF format, Argo data format (user's manual)

Data distribution: Global reference data sets (validation)

CORIOLIS GLOBAL DATASET -RELEASE 2008-

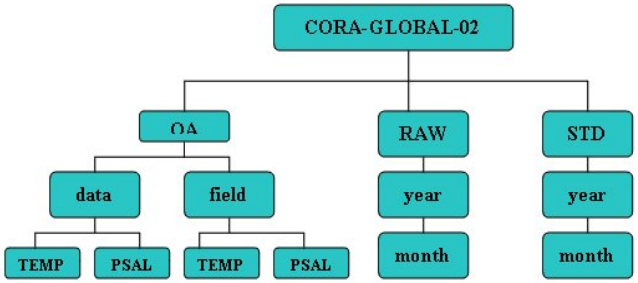
With the content of the database Coriolis produces reference datasets which have been cleaned using the objective analysis QC and additional visual QC. Compared to the release 2007, the release 2008 has been extended to the period 1990-2007.

This new reference dataset is called **CORA-GLOBAL-02** and is available on request to codac@ifremer.fr.

Year	Extraction Date	Data distribution
1990	05/03/2008	01/10/2008
1991	06/03/2008	01/10/2008
1992	30/11/2007	02/10/2008
1993	06/12/2007	02/10/2008
1994	10/12/2007	02/10/2008
1995	15/12/2007	02/10/2008
1996	21/01/2008	02/10/2008
1997	23/01/2008	03/10/2008
1998	24/01/2008	03/10/2008
1999	25/01/2008	03/10/2008
2000	25/01/2008	03/10/2008
2001	28/01/2008	03/10/2008
2002	25/02/2008	04/10/2008
2003	10/03/2008	04/10/2008
2004	28/03/2008	04/10/2008
2004	28/03/2008	04/10/2008
2005	28/03/2008	04/10/2008
2006	29/03/2008	04/10/2008
2007	29/03/2008	04/10/2008

- 2 releases in 2007 and 2008
- Data sets (T & S)
- Gridded fields
- On request to codac@ifremer.fr

Data available in the CORA-GLOBAL-02 directory are ordered in 3 sub-directories: ***oa***, ***raw*** et ***std***. These sub-directories relate to the gridded fields (oa), to the raw data and to the data interpolated at standardized levels.



Temperature and salinity analysis: global, atlantic, regional

Objective analysis :

Operational since December 2002

Method

- Optimal interpolation (Bretherton et al.,1975)

Data

- Temperature and salinity profiles from Argo profilers, XBT, XCTD, CTD, buoys
- Time series (Pirata moorings, ..)

Configuration

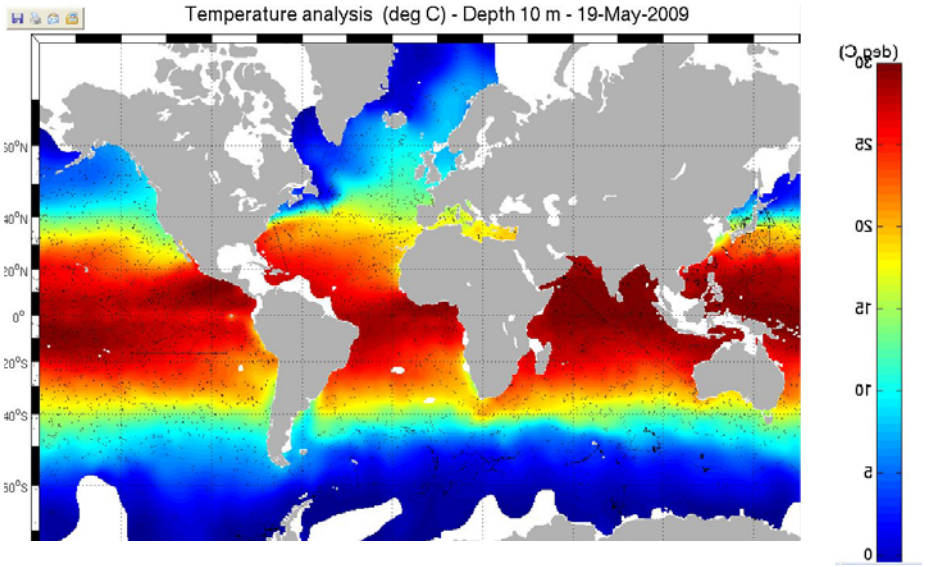
- grid with 1/3° resolution
- 59 levels from 0 to 2000 m

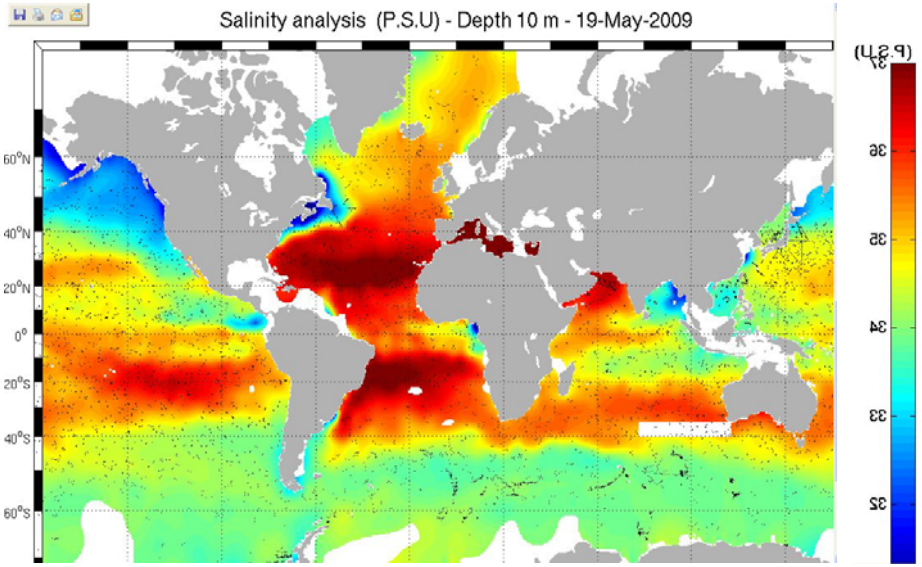
Output:

- T & S fields
- Analysis residuals for each observation

Foreseen:

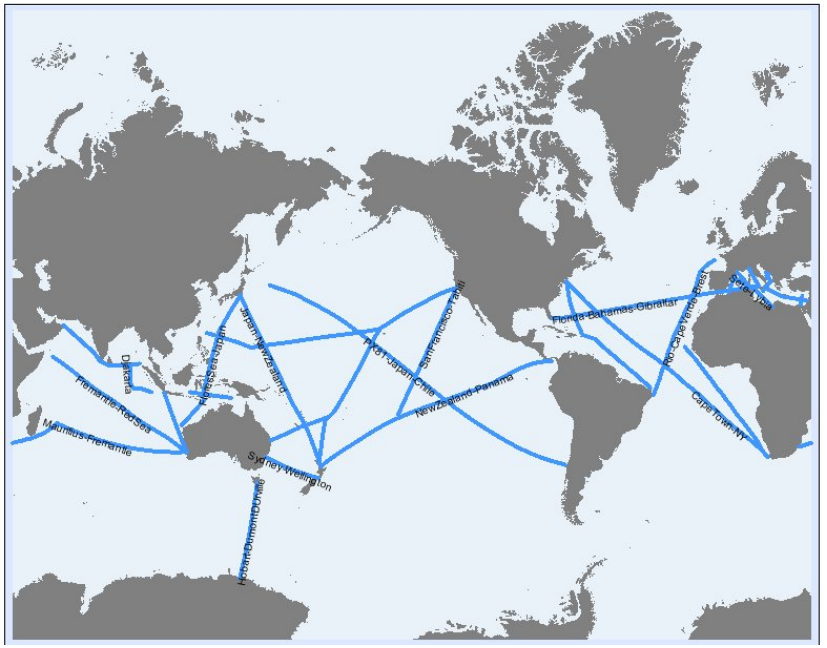
- Extension to surface data
- Regional analysis





Next steps

- Enlarge the data sources especially in the frame of the EU project MyOcean
- Reshape the web site by adding new functionalities
  - Global data selection
  - Data selection along WOCE lines



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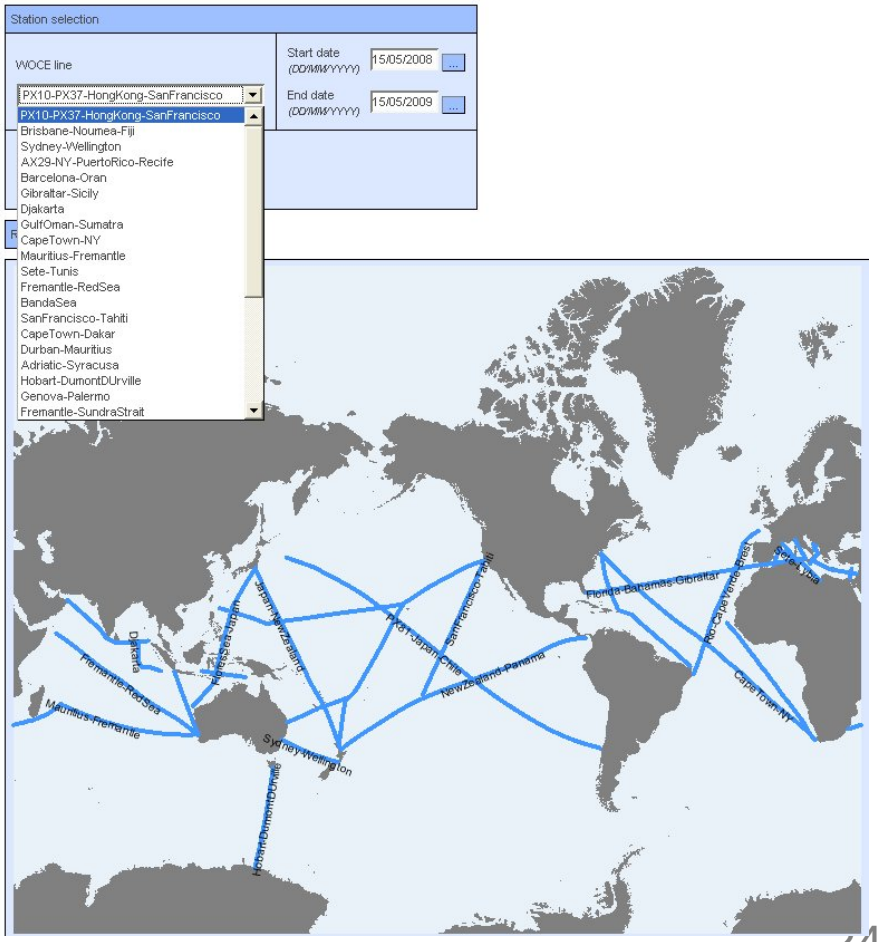

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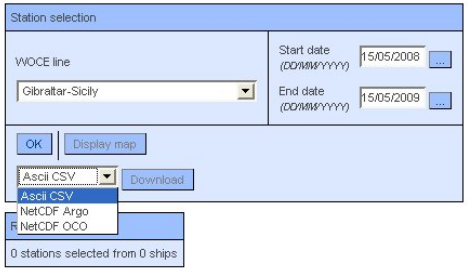

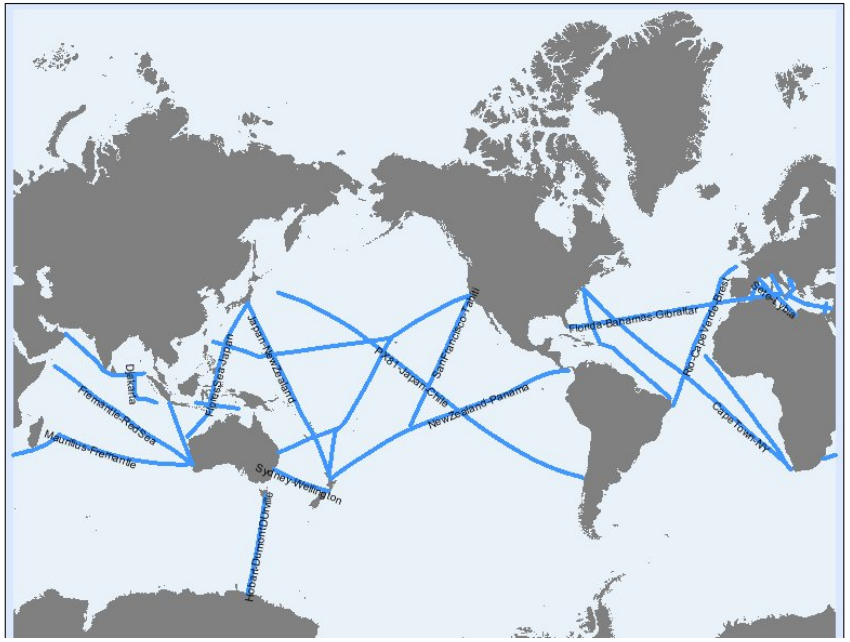

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Coriolis Data Centre