Drifter Data Assembly Center

Revised
December
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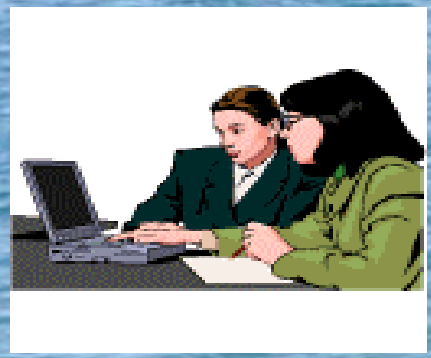
Quality Control Procedures Applied to Drifter Data

by

Mayra Pazos

The DAC and the GDC work together but have different tasks and databases

GDC



DAC

Takes care of logistics, from the request of the Argos IDS, to the deployment of the buoys

- Develops & coordinates drifter deployment plans
- Finds ships for deployments
- Distributes IDS to manufacturers
- Maintains Metadata

Craig Engler

Maintains a database with drifter data from deployment until buoy stops transmitting, and QC data

- Decodes raw data & applies calibrations
- Quality controls and interpolates data
- Makes data available through web and distributes for archiving
- Disseminate buoys going on/off GTS

Mayra Pazos

Jessica Redman

Drifter DAC Objective

"Our goal is to assemble and provide uniform *quality controlled* data of *research quality* for sea surface temperature and surface velocity measurements "

Drifter Database Information Files

- Relational database using flat files linked by ARGOS ids
- Data starts in February 1979 and continues to present
- All buoys are standard WOCE/SVP drogued at 15 meters

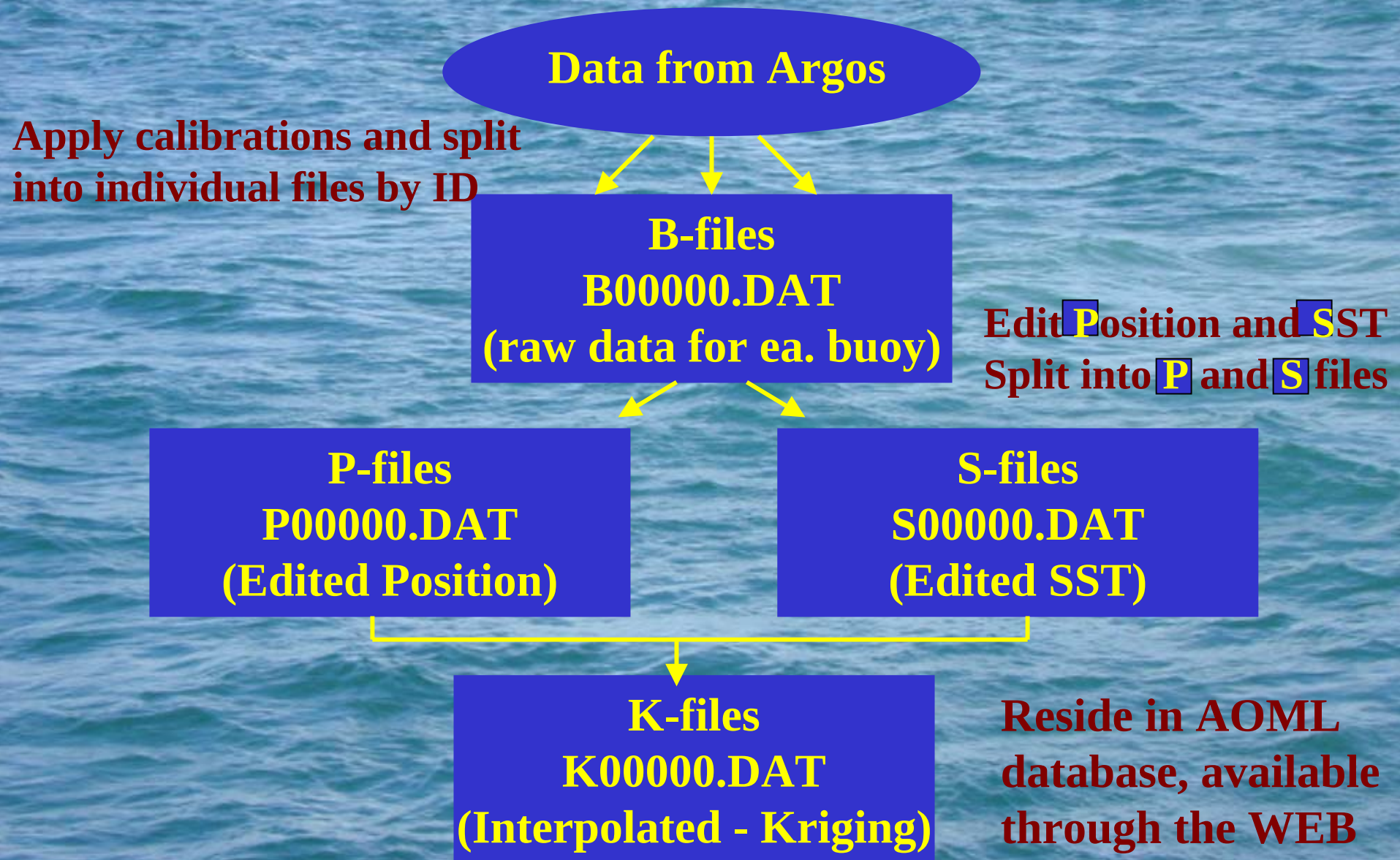
DIRECTORY FILE
(information about ea. Drifter)

CALIBRATION FILE
(coefficients to calibrate each sensor)

GROUND FILE
(holds time interval not to be interpolated)

TEMPERATURE FILE
(holds last day SST is good)

Drifter Database Data Files



Quality Control Steps

- *Decode data from Argos:*

  Convert to engineering units and add to individual B-file by ID

- *Identify new buoys and enter into the DIRECTORY file:*

  Determine deployment time and position of first good transmission from the water

- *Find dead buoys, pick last time, position and determine cause of death:*

  Run programs that identify buoys transmitting from the same location after a successful deployment or buoys that do not have any new data after last update, enter into the DIRECTORY file

- ***Check SST sensor failure, determine last good day for SST:***

  SST's from each buoy are compared with Reynolds' climatology to determine temperature sensor failure, last good day is entered into the TMPFL file.
  SST after this date will be discarded

- ***Edit Position and SST:***

  Software to check bad locations from the ARGOS raw data based on speed between consecutive locations are run, bad points are deleted. At the same time, deviant SST values are removed by applying a temperature change criterion relative to the recent temperatures measured by the buoy

NOTE: We decode, archive and handle GTS data transmissions and deletions of other sensor data like pressure and wind, but NO quality control is applied to them

- *Determine drogue lost date:*

  Buoys that possibly lost their drogues are identified.
  Drogue lost date is determined and entered in the DIRECTORY file

- *Interpolation of edited data into 6 hour intervals using Kriging Method:*

  All active buoys are processed and interpolated
  Refer to paper by Hansen and Poulain for details on the Editing and Kriging procedures:

Hansen, D.V. and P.-Marie Poulain, 1996. Quality Control and Interpolations of WOCE/TOGA Drifter Data. J. Atomos. Oceanic Tec., 13, 900-909

- *Insertion of interpolated data into the AOML Informix database:*

  Kriged drifter data can be accessed through the WEB

WWW.AOML.NOAA.GOV/PHOD/DAC/DACDATA.HTML

*** AOML Environmental Data Server**

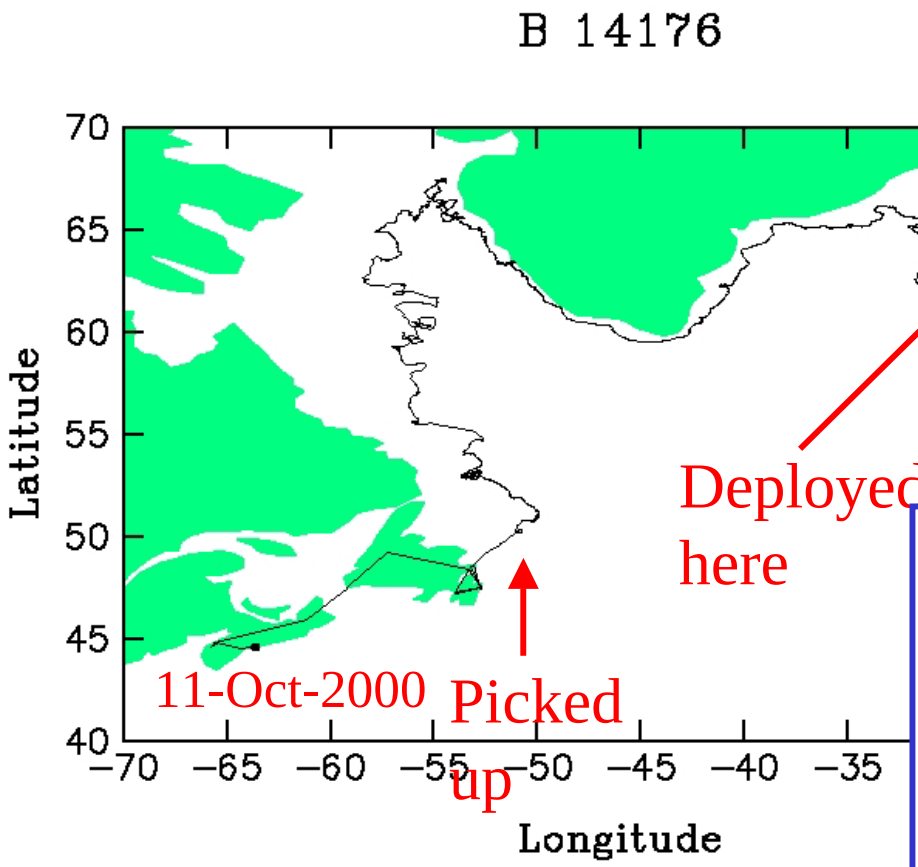
- *Update database every 2-3 months.*

- ***Return unused ids to Service Argos***

  Service Argos charges for IDs of buoys that have not transmitted for 2 years. To avoid extra charges, the DAC returns to Argos IDS periodically, and renames existing IDs by adding 2 digits in front of the original ID assigned. The two digits are either the year the ID was assigned or the deployment year. This is absolutely necessary because the buoy ID is used in the database as the key identifier and file name, and fail to change the original name might mean confusion, since Service Argos reuses IDs that have been returned to them.

  The DIRECTORY file can be used to identify drifters that have been renamed, by comparing it with the one from the previous update.

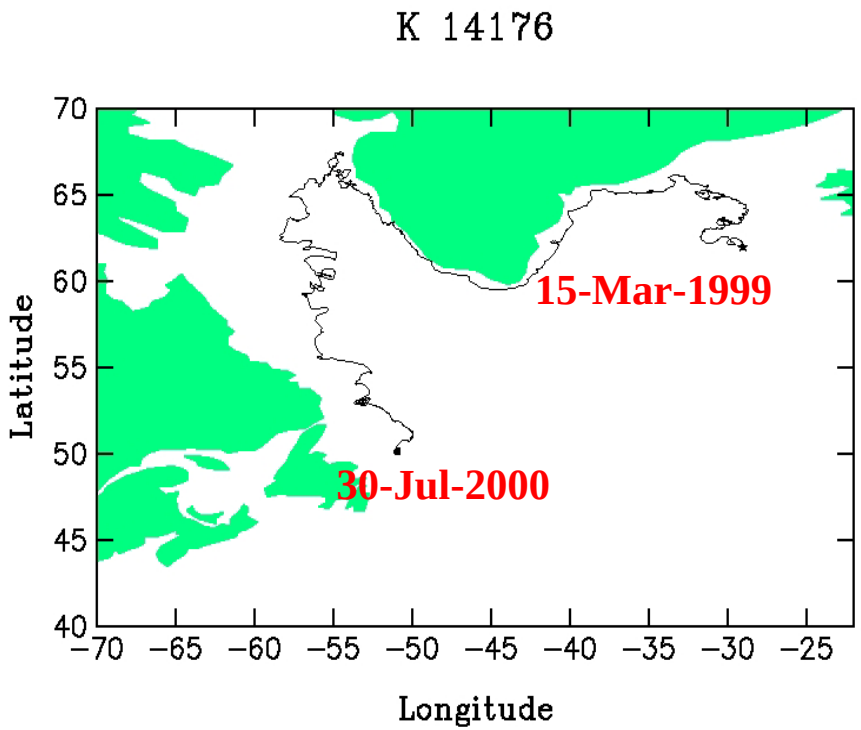
QC Examples



Track from Raw Data

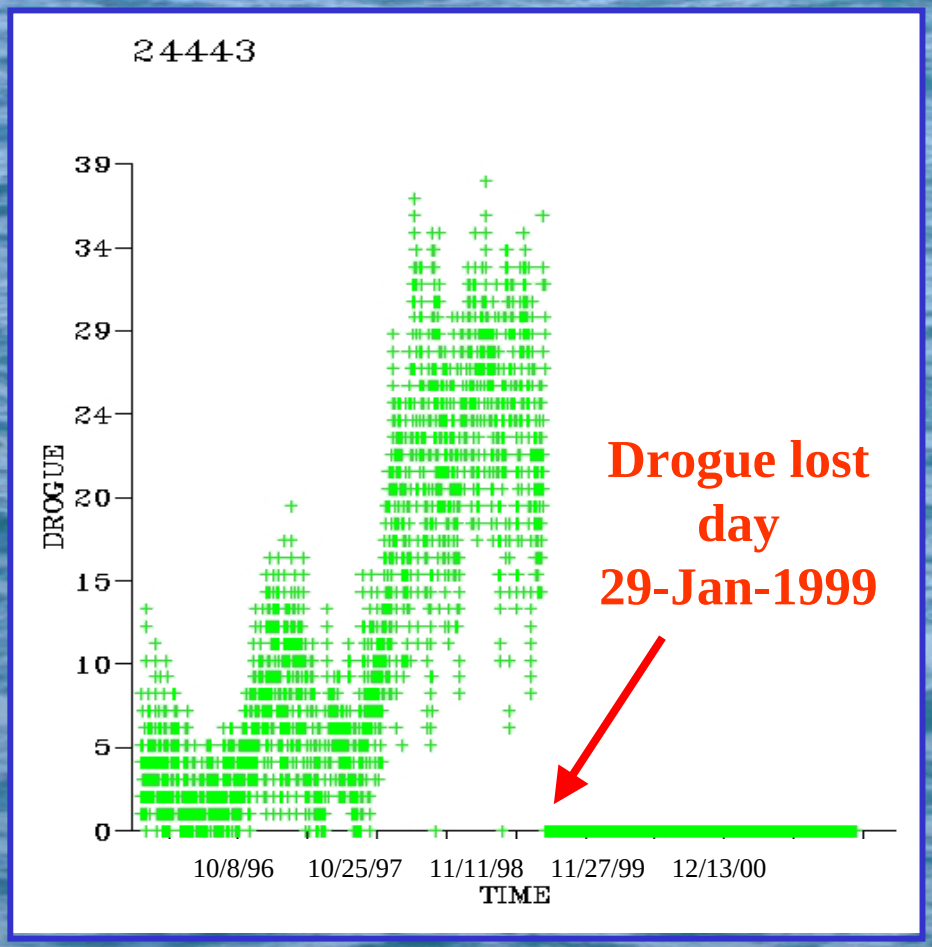
(B-file)

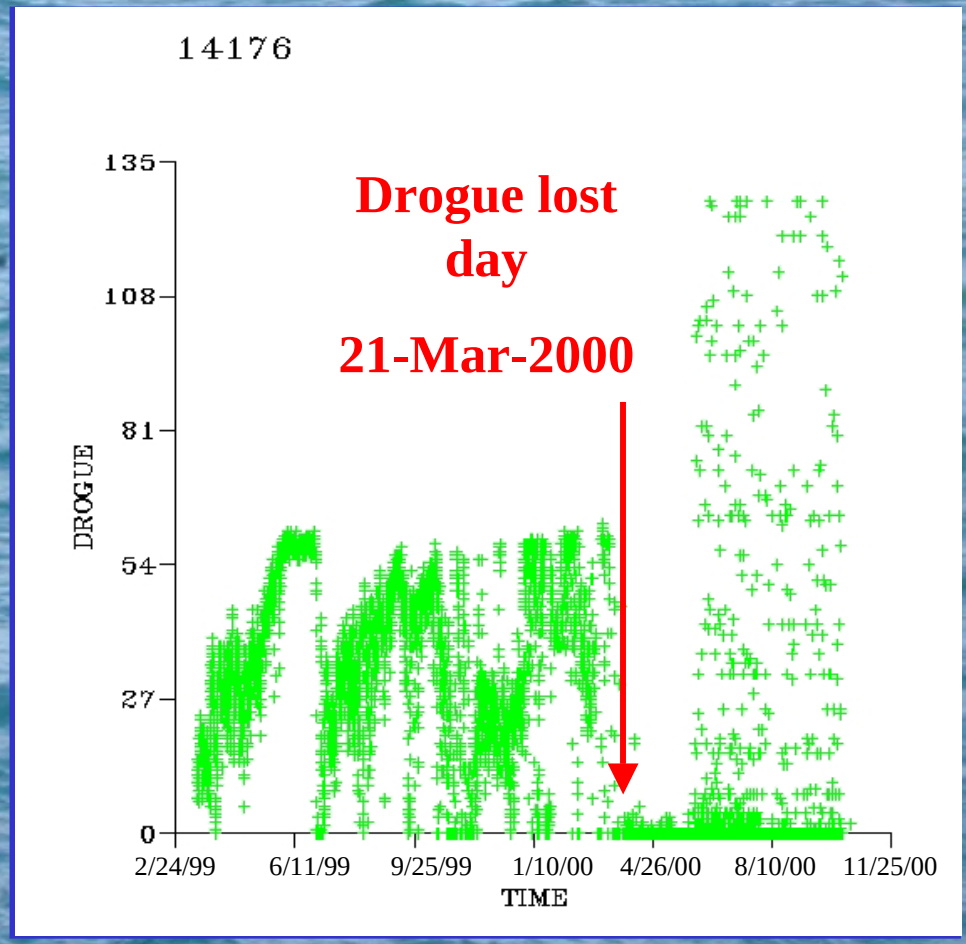
Track after Editing and Interpolation routines are run (K-files)



QC Examples

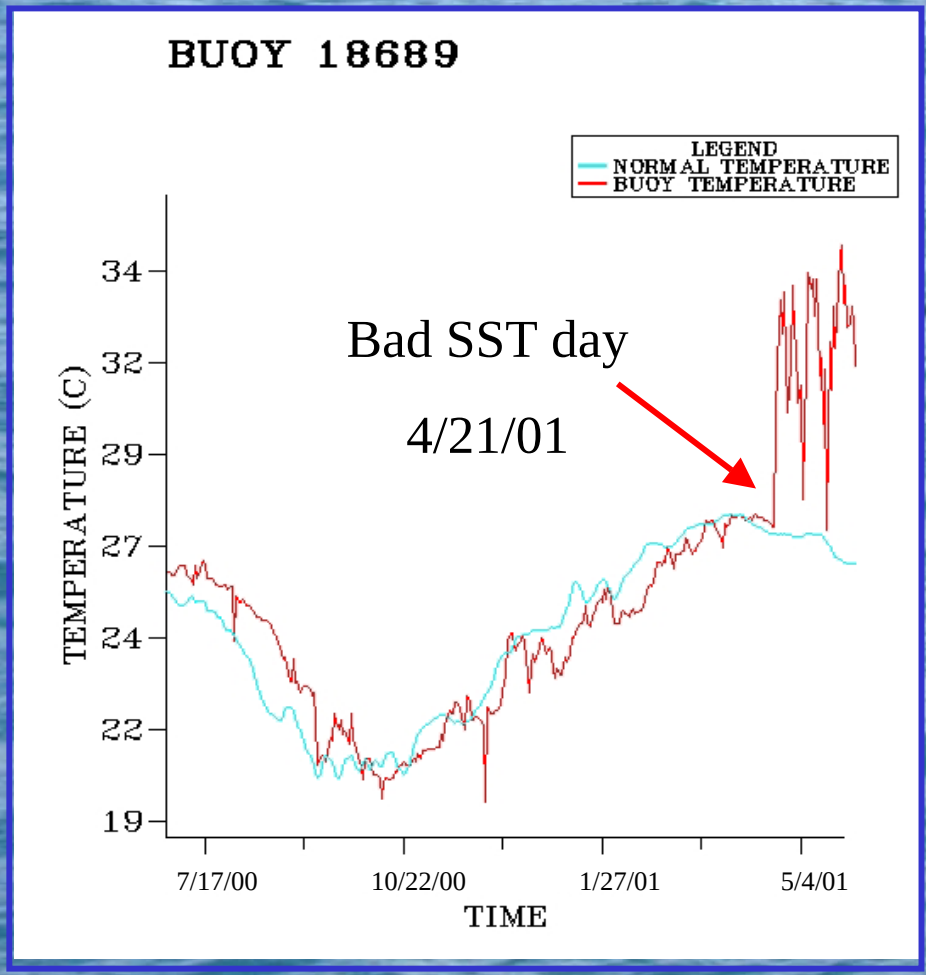
Determining Drogue status

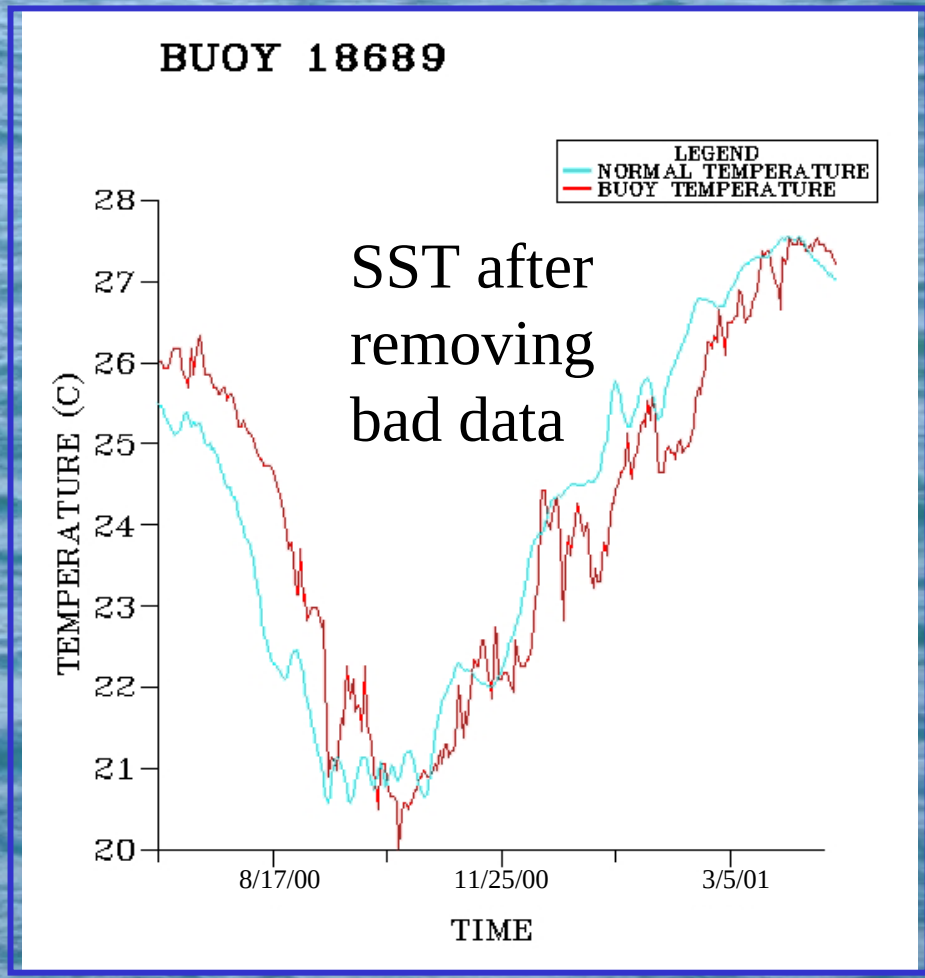




QC Examples

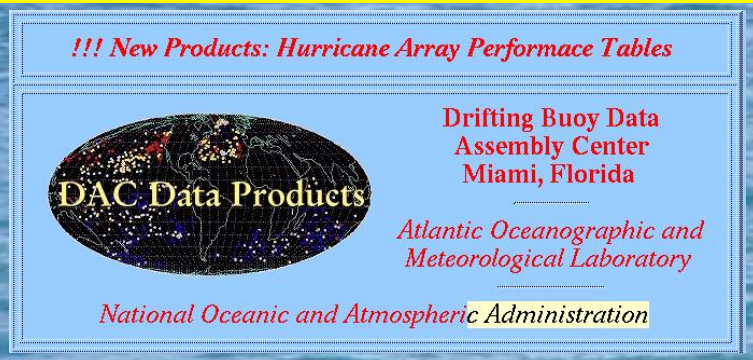
Determine Failure of SST Sensor (comparing with Reynolds Climatology

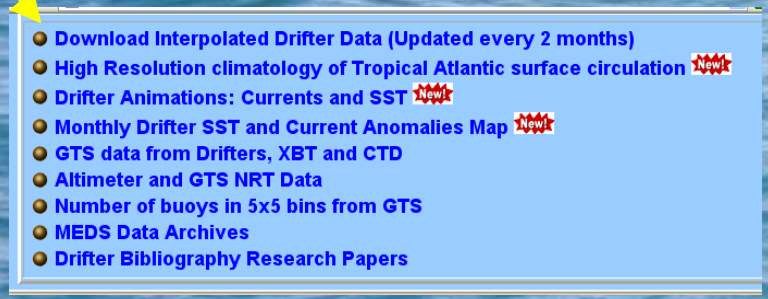




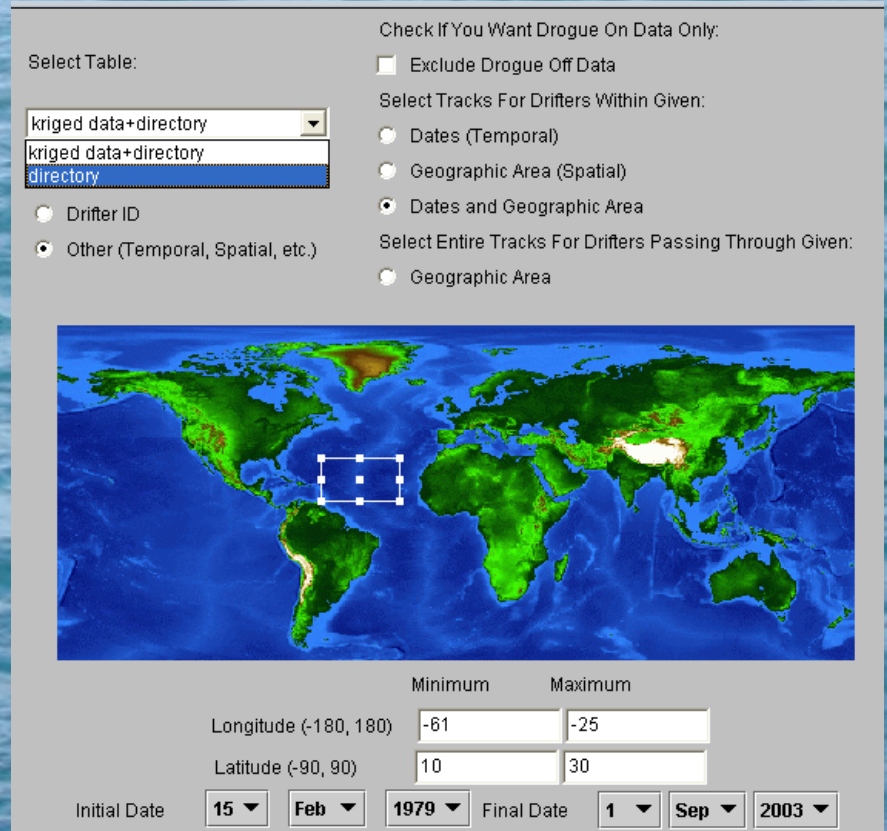
Downloading Data from the WEB

www.aoml.noaa.gov/phod/dac/dacdata.html





You can select to download Kriged data + directory file. Using the cross hairs select area of interest, directory of buoys in area will also be created.



OR

You can choose to download the directory file alone, with the history of every buoy in the database.

Sample Directory File

Access & Retrieval System

To download file, click on retrieve table, then choose “file and save as” in your browser menu

[Retrieve Table] [AOML][Description of Fields]

Table: directory (*first 10 rows are displayed*)

id	wmo	expno	typebuoy	ddate	dtime	dlat	dlon	edate	etime	elat	elon	ldate	ltime	typedeath
1224	15505	2065	SVP	1999/07/29	19:29	-29.490	16.110	2002/03/29	01:00	-28.440	-16.830	2002/03/29	01:00	3
1282	0	1348	SVP	1998/06/04	10:39	44.630	-124.250	2001/07/13	17:36	23.410	-153.130	1999/12/09	17:47	3
1287	33622	1239	SVPB	1997/10/02	22:48	-38.800	-54.840	2002/06/11	04:20	-32.370	-32.020	2002/06/11	04:20	3
1445	51844	9325	SVP	1999/05/11	01:55	0.030	-141.540	2001/05/25	15:26	-18.030	167.780	1999/05/11	01:58	3
1611	13537	30271	SVP	1997/06/26	16:03	3.820	-22.480	2000/07/04	23:00	-0.150	-46.200	2000/07/04	23:00	3
1831	32629	9325	SVP	2000/03/06	13:36	-9.990	-88.830	2001/08/20	03:50	-21.450	-136.410	2001/08/20	03:50	1
1997	0	1955	SVP	1999/04/11	17:45	8.320	-52.620	2000/05/16	17:15	1.800	-19.780	2000/05/16	17:15	3
2258	21901	9325	SVPB	1999/09/02	05:52	28.830	127.690	2000/10/16	08:56	24.730	172.260	2000/10/16	08:56	3
2400	32866	1425	SVP	1993/03/25	00:37	-11.790	-85.880	2000/04/17	05:03	-37.900	-105.440	1994/05/13	14:58	4
2590	0	9046	SVP	2001/06/23	04:53	48.860	-49.610	2002/01/03	20:47	50.720	-39.630	2001/06/23	04:58	3

Rows Retrieved = 7327

Up to 10 rows are printed

Sample Data + Directory File

To download file, click on retrieve table, then choose “file and save as” in your browser menu

[Retrieve Table] [AOML][Description of Fields]

Table: directory (*first 10 rows are displayed*)

id	wmo	expno	typebuoy	ddate	dtime	dlat	dlon	edate	etime	elat	elon	ldate	ltime	typedeath
21132	43544	7325	SVP	2001/06/20	09:01	8.020	-105.010	2003/07/13	22:10	7.890	-105.410	2002/06/12	14:34	3
39068	32538	6325	SVP	2003/01/04	07:59	2.040	-92.890	2003/08/31	21:19	3.890	-99.870	0000/00/00	00:00	0

Table: krig (*first 10 rows are displayed*)

id	date	time	lat	lon	t	ve	vn	speed	varlat	varlon	vart
21132	2003/07/01	00	7.618	-108.469	27.989	56.566	6.493	56.937	2.14880e-04	9.32330e-05	3.03520e-03
21132	2003/07/01	06	7.626	-108.349	27.938	56.845	1.570	56.867	6.55800e-05	2.66940e-05	3.19200e-03
21132	2003/07/01	12	7.624	-108.247	27.899	48.439	-7.302	48.987	6.16760e-05	2.51530e-05	3.91080e-03
21132	2003/07/01	18	7.597	-108.159	27.862	47.975	-15.217	50.331	2.29750e-05	1.02640e-05	3.29680e-03
21132	2003/07/02	00	7.564	-108.059	27.848	42.143	-13.515	44.257	1.18950e-04	4.89040e-05	3.83060e-03
21132	2003/07/02	06	7.544	-107.994	27.850	38.335	-13.862	40.764	6.14910e-06	6.72280e-06	3.39250e-03
21132	2003/07/02	12	7.510	-107.909	27.854	37.874	-8.604	38.839	4.29810e-05	1.84700e-05	3.72300e-03
21132	2003/07/02	18	7.511	-107.846	27.763	41.434	0.437	41.436	2.44360e-05	1.06420e-05	3.31790e-03
21132	2003/07/03	00	7.512	-107.747	27.658	42.888	-4.682	43.143	5.91440e-05	2.37490e-05	3.78350e-03
21132	2003/07/03	06	7.492	-107.678	27.696	38.764	-10.573	40.180	1.47040e-05	8.78210e-06	3.43740e-03

Rows Retrieved = 160

Up to 10 rows are printed

[Retrieve Table] [AOML][Description of Fields]

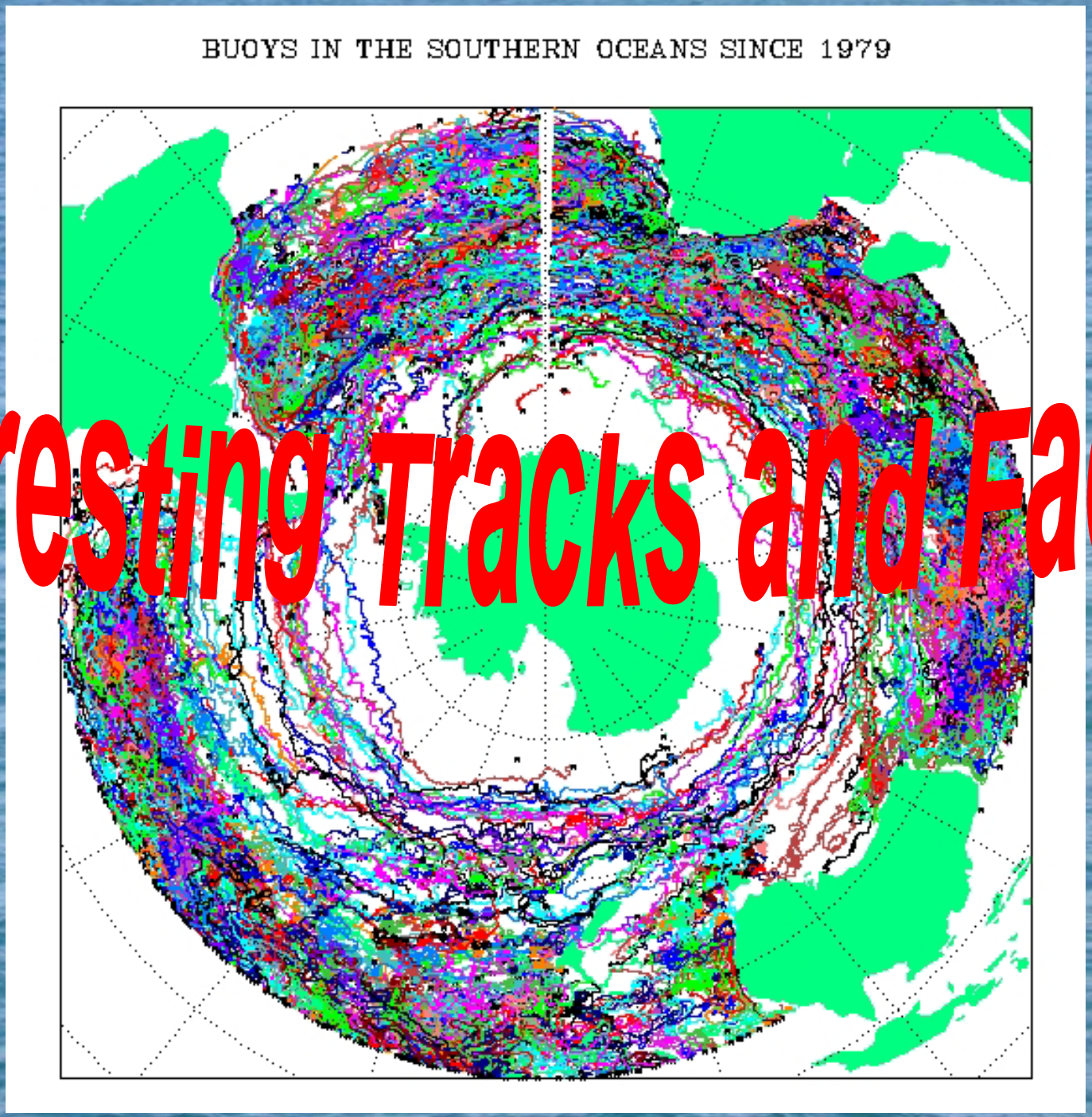
Other DAC Responsibilities

- Insertion and deletion of buoys onto the GTS
- Notify ARGOS after each database update of buoys that lost their drogues to be noted in the GTS message
- Maintain data products updated on the WEB
- Send periodic database updates to MEDS for archival and distribution

Future Work

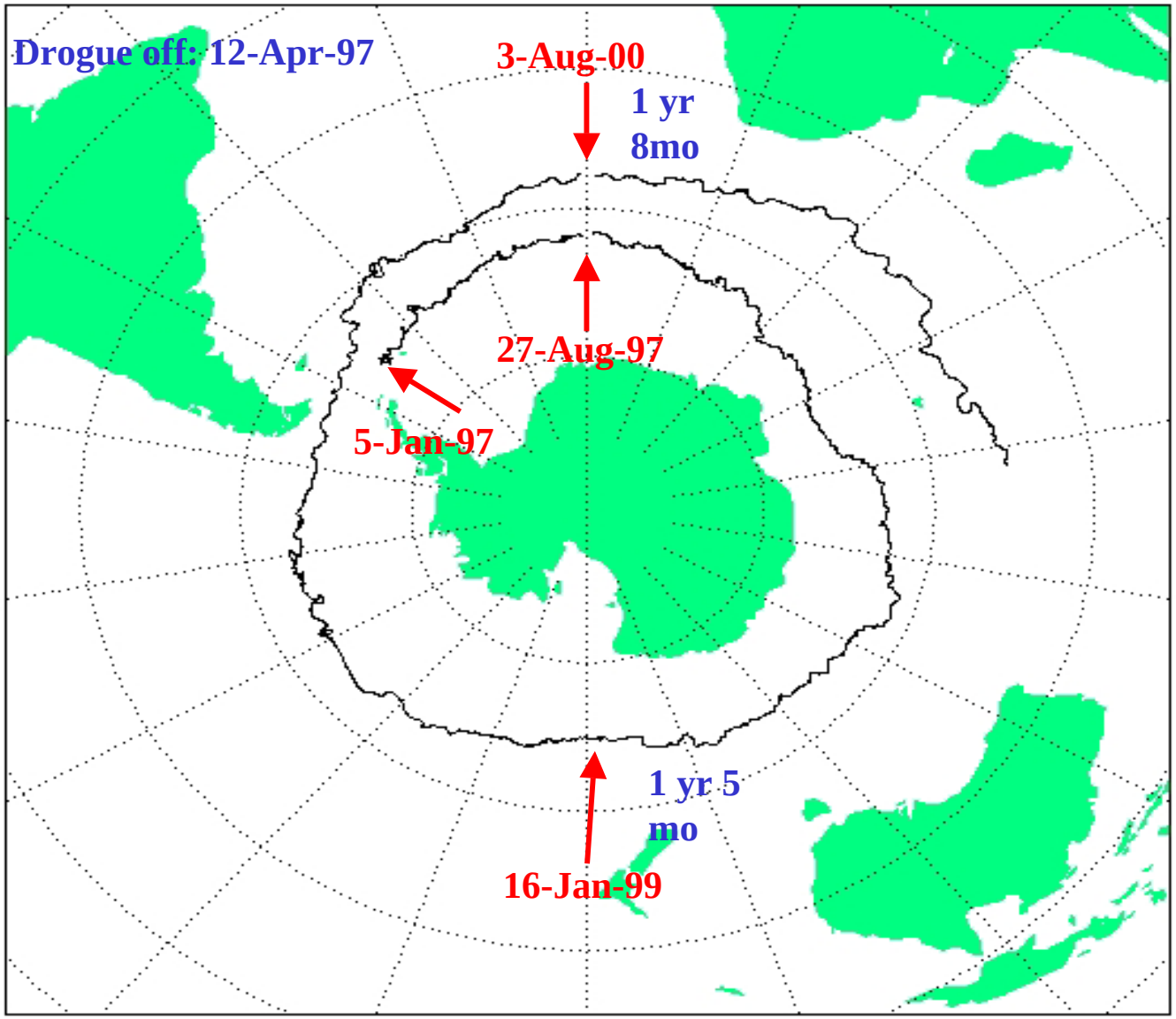
- Closely monitor drifter failure of transmitters, SST and drogue sensors on real time

- Follow up and make sure data distributed through GTS goes out and values are correct



Interesting Tracks and Facts

24442


Drogue off: 12-Apr-97
3-Aug-00
1 yr
8mo
27-Aug-97
5-Jan-97
1 yr 5
mo
16-Jan-99