

For Using Data

Data Policy	JAMSTEC
Principal Investigator	Data Management Office
Use Constraints	See Terms and Conditions about constrain of use.
Data Citation	See Terms and Conditions about data citation.

Quality

DMO-Processed

Instrument

Radio navigation system



Overview

The following information is continuously collected and recorded as the Navigation QCed data during the cruise of R/V MIRAI.

Time
Location
Surface temperature
Wind direction and velocity
Current direction and velocity
Water depth

Data are recorded every one minute, and data file named after cruise code.

System

Manufacturer: SENA Co., Ltd.
Model: Sena Advanced Integrated Navigation System Data format version 02.6

Sensor specifications

- 1) GPS receiver
 - Manufacturer: Fugro Survey Limited
 - Model: StarPack-D
 - Receiver location: Compass deck [starboard side]
Compass deck [port side]
 - Output data: NMEA
- 2) Doppler sonar
 - Manufacturer: FURUNO ELECTRIC CO., LTD.
 - Model: DS-30
 - Range:
 - Ship speed: -10.00 - +40.00knot [Cross direction]
-9.99 - +9.99knot [Horizontal direction]
 - Current direction and speed: 0.0 - 9.9knot [All direction]
 - Accuracy: Current speed: +/- (2.0% + 0.2 knot)
- 3) Multi narrow beam echo sounder
 - Manufacturer: Elac
 - Model: SeaBeam3012
 - Frequency: 12kHz
 - Range: 50m - 11,000m
- 4) Anemometer
 - Manufacturer: Koshin Denki Kogyo Co., Ltd.
 - Model: KE-500
 - Altitude: 24m (above sea level)
 - Starting wind speed: 2m/s or less

Durability: 90m/s
Accuracy: 10m/s or less +/-0.5m/s
10m/s or more +/-5%

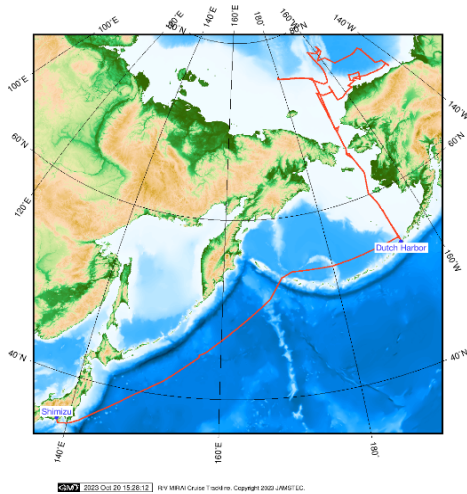
Note

Please see the 'data set' and 'readme' for the detail of the following observation.

Air temperature:	Marine Meteorology
Sea surface temperature:	Underway Thermosalino Graph
Atmospheric pressure:	Marine Meteorology
Relative humidity:	Marine Meteorology
Water depth:	Bathymetry (MBES)
Current direction/speed:	Shipboard Acoustic Doppler Current Profiler (ADCP)

Related Information

R/V MIRAI Cruise Trackline in MR23-06C



MR23-06C

Ship Name:	MIRAI
Period:	2023/08/25 - 2023/10/04
Chief Scientist:	Amane Fujiwara (JAMSTEC)
Proposal:	Arctic Expedition for Environmental Studies Observational study of the Arctic environmental changes: Pacific-Arctic interaction, biogeochemical transport, mixing and marine ecosystem
	Research and development of under-ice observation technology
	Quantification of the microplastic inventory in the waters of the western Arctic Ocean and microplastic influx from the Pacific Ocean
	Changes in clouds and aerosols over the ice-free Arctic Ocean
	Possibility of the expanding distribution in plankton and fishes associated with sea ice reduction in the Pacific sector of the Arctic Ocean
	Observation of air-sea-wave-ice interaction over the Pacific Arctic region
	Investigating the physical and ecophysiological basis of fall phytoplankton blooms in the Chukchi and Beaufort seas
	Nitrogen Fixation in a Changing Arctic Ocean An Overlooked Source of Nitrogen
	Exploring microplankton interactions and their functional roles in a changing Arctic
	Determining the contribution of siphonophores to mesopelagic backscatter in the Arctic
	Better understanding of climate-driven changes of biogeochemical dynamics in the western Arctic Ocean via R/V Mirai 2023 Cruise A perspective of stable carbon isotope
	Temporal variations of the carbonate chemical components the Arctic Ocean within summertime
	Observation of water vapor isotopic ratios Observation of atmospheric greenhouse gases and related species in the North Pacific region

Format Description for QCed Data of Navigation

The one record of this data has 117 bytes of data part and 12 bytes of flag part.

Data part

No.	Column	Content	Format	Unit	Remarks
1	1 - 8	Date	i4,i2,i2		YYYYMMDD (UTC)
2	10 - 15	Time	i2,i2,i2		hhmmss (UTC)
3	17 - 19	Datum	a3		W84:WGS84 TD_:TOKYO DATUM
4	21 - 31	Latitude	i2,x1,f7.4,a1	degree - minute	dd-mm.mmmmmN(S)
5	33 - 44	Longitude	i3,x1,f7.4,a1	degree - minute	ddd-mm.mmmmmE(W)
6	46 - 49	Ship speed(Ground)	f4.1	knot	
7	51 - 55	Course(Ground)	f5.1	degree	
8	57 - 60	Ship speed(Water)	f4.1	knot	*1
9	62 - 66	Gyro	f5.1	degree	
10	68 - 72	Air temperature	f5.1	deg-C	
11	74 - 78	Sea surface temperature(SST)	f5.2	deg-C	
12	80 - 85	Atmospheric pressure	f6.1	hPa	Adjusted to the sea surface level
13	87 - 89	Relative humidity	i3	%	
14	91 - 93	True wind direction	i3	degree	Averaged over the previous 6 seconds *2
15	95 - 98	True wind speed	f4.1	m/sec	Averaged over the previous 6 seconds *2 No anemometer height adjustment
16	100 - 106	Depth	f7.1	m	
17	108 - 112	Current direction	f5.1	degree	Calculated value
18	114 - 117	Current speed	f4.1	knot	Calculated value

Flag part

No.	Column	Content	Format	Remarks
19	119	Flag 1	i1	QC flag for 'Latitude' and 'Longitude'
20	120	Flag 2	i1	QC flag for 'Ship speed (Ground)'
21	121	Flag 3	i1	QC flag for 'Course (Ground)'
22	122	Flag 4	i1	QC flag for 'Ship speed (Water)'
23	123	Flag 5	i1	QC flag for 'Gyro'
24	124	Flag 6	i1	QC flag for 'Air temperature'
25	125	Flag 7	i1	QC flag for 'Sea Surface Temperature (SST)'
26	126	Flag 8	i1	QC flag for 'Atmospheric pressure'
27	127	Flag 9	i1	QC flag for 'Relative humidity'
28	128	Flag 10	i1	QC flag for 'Wind direction' and 'Wind speed'
29	129	Flag 11	i1	QC flag for 'Depth'
30	130	Flag 12	i1	QC flag for 'Current direction' and 'Current speed'

*1 The plus and minus sign of No.8 [Ship speed (Water)] about R/V KAIREI indicates the velocity of direction of a bow and stem.

*2 No.14 [True wind direction] and No.15 [True wind speed] about R/V SHINSEI MARU are instantaneous value.

* The terminator of each record is 'CR+LF' code.

* Missing value and format error value are filled with '9'.

Definition of Quality Control Flags

Flag 1 : Longitude and Latitude

- 1 - accepted
- 2 - questionable value
- 4 - failed in location check
- 9 - system error or input error

Flag 2 : Ship speed (ground)

- 1 - accepted
 - 2 - questionable value
 - 4 - failed range check (under 20 knots)
 - 9 - system error or input error
- Flag 3 : Course (ground)
- 1 - accepted
 - 2 - questionable value
 - 4 - failed range check (0 ~ 360 degree)
 - 9 - system error or input error
- Flag 4 : Ship speed (water)
- 1 - accepted
 - 4 - failed range check (under 20 knots)
 - 9 - system error or input error
- Flag 5 : Gyro
- 1 - accepted
 - 4 - failed range check (0 ~ 360 degree)
 - 9 - system error or input error
- Flag 6 : Air temperature
- 3 - assumed good*
 - 4 - failed range check (-20 ~ 40 degC)
 - 9 - system error or input error
- Flag 7 : Sea surface temperature
- 3 - assumed good*
 - 4 - failed range check (-3 ~ 37 degC)
 - 9 - system error or input error
- Flag 8 : Atmospheric pressure
- 3 - assumed good*
 - 4 - failed range check (890 ~ 1040 hPa)
 - 9 - system error or input error
- Flag 9 : Relative humidity
- 3 - assumed good*
 - 4 - failed range check (0 ~ 100 %)
 - 9 - system error or input error
- Flag 10 : Wind direction and wind speed
- 3 - assumed good*
 - 4 - failed range check (0 ~ 360 degree : wind direction, 0 ~ 60 m/s : wind speed)
 - 9 - system error or input error
- Flag 11 : Depth
- 3 - assumed good*
 - 4 - failed range check (4 ~ 11000 m)
 - 9 - system error or input error
- Flag 12 : Current direction and current speed
- 3 - assumed good*
 - 4 - failed range check (0 ~ 360 degree : current direction, 0 ~ 5 knots : current speed)
 - 9 - system error or input error

* 'assumed good' means that this data passed range check but may contains leap or inappropriate zero.