Meteorological observation data from seafaring vessels are used in the production of marine weather forecasts and warnings as well as in monitoring and research relating to climate change. Ships conducting voluntary observation play pivotal roles in the collection of such data, as there are far fewer meteorological observation sites in sea areas than on land. Operators are invited to provide marine weather observation data to help improve the quality of weather-related information.

### Marine Meteorological Observations

To support the collection of weather data over vast ocean areas, the World Meteorological Organization (WMO; a specialized agency of the United Nations) encourages ships to observe meteorological variables such as atmospheric pressure and wind/wave conditions and to submit related data. In Japan, marine meteorological observation and reporting are required under the Meteorological Service Act. Operators should submit Real-time Weather Reports and Meteorological Logbooks even if the requested dataset is incomplete, as all such data are highly useful.

**Real-time Weather Reports**
- Transmitted immediately after observation via the Inmarsat C service using special access code 41 (no charge to ship) or by e-mail
- Exchanged immediately and internationally, and used to produce weather forecasts and warnings

**Meteorological Logbooks**
- Submitted within ten days of ships calling at Japanese ports by e-mail or regular mail using an envelope provided by the Japan Meteorological Agency (JMA)
- Exchanged internationally after quality control by JMA and archived to build long-term records for climate-change monitoring

### TurboWin Program for Marine Meteorological Observation

TurboWin is a widely used free program developed by KNMI (the Royal Netherlands Meteorological Institute). The program automatically encodes manual input data in formats for real-time weather reports and marine meteorological logbooks.

**How to get TurboWin**
- Request an installation CD from JMA.
Port Meteorological Officers and Related Services

National Meteorological Services appoint Port Meteorological Officers (PMOs) to the main ports in their countries.

PMOs are appointed at the ports of Yokohama, Nagoya and Kobe in Japan. Port Meteorological Services are also available at the ports of Ishikariwan Shinko, Sendai-Shiogama, Tokyo, Osaka, Hakata and Naha.

**Port Meteorological Services (no charge)**

PMOs pay visits to ships in order to:
- check barometers and other meteorological instruments; and
- provide advice on meteorological and oceanographic matters.

Barometer Checking Service

Barometers need to be checked every six months to support observation accuracy.

PMOs board ships to check instruments and attach a card (free of charge) showing information on pre-reporting correction to be made to actual pressure readings from the relevant device.

JMA also provides e-mail/fax barometer checking services for ships to which PMO visits may be impractical. To request such services, e-mail or fax the designated form.

Provision of Materials on Marine Meteorological Observation

JMA provides guides, pamphlets, TurboWin installation CDs and other materials on meteorological observation and marine weather information free of charge.

2. Guide to Ships’ Weather Reports
4. TurboWin installation CD
5. Marine Meteorological Logbook
6. Envelope for sending logbooks or floppy disks
7. Envelope for sending CD-Rs
8. Ships’ weather code card
9. Beaufort scale of wind force
10. Table for finding the dew-point
11. JMA cloud plate
12. Marine meteorological information services for shipping and fishing
13. Guide to Sea Ice Information
Reporting on On-board Meteorological Instruments

Meteorological observation data from ships are used for monitoring and research on climate change as well as weather forecasts. As indicators of climate change can be very subtle, metadata from on-board meteorological instruments, whose operation influences seaborne meteorological observations, are essential for accurate analysis. Reports on Equipment of Meteorological Instruments on Board should be submitted annually to support metadata correction.

Metadata from vessels registered as International Voluntary Observing Ships (VOSs) via this reporting are exchanged among National Meteorological Services, and contribute greatly to monitoring and research on climate change.

Ships' Weather Observations/Reports Website

JMA's Ships' Weather Observations/Reports * website supports seafaring activities relating to marine meteorological observation and reporting. Available resources include materials for weather observation, such as the TurboWin installer and the form for requesting barometer checking by e-mail or fax.


Port Meteorological Service Offices

**PMO Yokohama, Yokohama Local Meteorological Observatory**
99 Yamatecho, Naka-ku, Yokohama 231-0862
TEL: +81 45 621 1991  FAX: + 81 45 622 3520

**PMO Nagoya, Nagoya Local Meteorological Observatory**
2-18 Hiyoriicho, Chikusa-ku, Nagoya 464-0039
TEL: +81 52 752 6364  FAX: +81 52 762 1242

**PMO Kobe, Kobe Local Meteorological Observatory**
1-4-3 Wakinohamakaigan-dori, Chuo-ku, Kobe  651-0073
TEL: +81 78 222 8918  FAX: +81 78 222 8945

E-mail : pmo@climar.kishou.go.jp (common to all)

**Sapporo District Meteorological Observatory**
18-2 Kitanoi-nishi, Chuo-ku, Sapporo 060-0002
TEL: +81 11 611 6174  FAX: +81 11 611 3206

**Sendai District Meteorological Observatory**
1-3-15 Gorin, Miyagino-ku, Sendai 983-0842
TEL: +81 22 297 8107  FAX: +81 22 291 8110

**Osaka District Meteorological Observatory**
4-1-70 Otemae, Chuo-ku, Osaka 540-0008
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**Fukuoka District Meteorological Observatory**
1-2-36 Ohori, Chuo-ku, Fukuoka 810-0052
TEL: +81 92 725 3613  FAX: +81 92 761 1726

**Okinawa Meteorological Observatory**
1-15-15 Higawa, Naha 900-8517
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Contact JMA Headquarters

Contact JMA in relation to marine meteorological observation and related services.

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