

# Underway Metadata Form

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(\* = mandatory field)

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*On submission of a metadata record a notification is sent to the metadata creator with a link to metadata that was created.*

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Total Investigators in the Data Set: 2 ▼

## Dataset Info:

- Funding Information (funder, project name, grant number, e.g. MEXT Grant-in-Aid for Scientific Research (16310018), NOAA Climate Program or European Union CarboChange FP7 264879) :  
"Observation for Monitoring Background Marine Pollution" Project of Japan Meteorological Agency
- Submission Dates:
  - Initial Submission: 20040621 (yyyymmdd)
  - Revised Submission: 20140228 (yyyymmdd)

## Cruise Info:

- Cruise Information for the Expocode:
  - NODC Platform (Ship) Code List: 49UF [4 character NODC](#)
  - Start Date (cruise or data set, for Expocode): 20010120 (yyyymmdd)
  - Cruise Information for the expocode: 49UF20010120
- Other Cruise Info:
  - Survey type (e.g. VOS Lines, Research Cruise, Moored Buoy, Drifting Buoy):  
Research Cruise
  - Vessel Name:  
R/V Keifu Maru II
  - Vessel Owner: Ministry of Land, Infrastructure, Transport and Tourism
  - Cruise Info (e.g. SAVE, TTO-NAS, SOIREE, AMT08, Antares):  
VOS\_Keifu\_Maru\_2001\_2012/

- o Cruise Name (including Leg) (e.g. ANTV-2, Biscay\_979815C, D198):

KS0101 - KS0906, KS1203 - KS1205, KS0910 - KS1202, KS1206 - KS1207

- o End Date: 20120612 (yyyymmdd)

- o Ports of Call: (One per line)

Kobe, Japan  
Tokyo, Japan

- o Mooring ID if applicable:

- Geographical Coverage:

- o Geographical Region:

Pacific Ocean

- o Bounds:

- Westernmost Longitude:

Enter decimal fractions of degrees: 126.44 (+ = E, - = W)

- Easternmost Longitude:

Enter decimal fractions of degrees: 165.48 (+ = E, - = W)

- Northernmost Latitude:

Enter decimal fractions of degrees: 50.02 (+ = N, - = S)

- Southernmost Latitude:

Enter decimal fractions of degrees: -5.02 (+ = N, - = S)

## Variables Info:

- Variable:

- o Variable Name: XCO2\_AIR

- o Description of Variable: (units) UMOL/MOL

Variable #2:

- o Variable Name: XCO2\_EQ

- o Description of Variable: (units) UMOL/MOL

Variable #3:

- o Variable Name: ATM\_PRE

- o Description of Variable: (units) HPA

Variable #4:

- o Variable Name: EQ\_TMP

- o Description of Variable: (units) DEG\_C

Variable #5:

- o Variable Name: SST

- o Description of Variable: (units) DEG\_C

Variable #6:

- o Variable Name: SSS

- o Description of Variable: (units)

Total Variables in the Data Set: 6 ▾

## Surface Water CO2 Method Description:

- Sampling and Equilibrator Design:

- o Depth of Seawater Intake (m): 5

- o Location of Seawater Intake: Port sea-chest at the center in the longitudinal direction of a hull.

- o Equilibrator type: Shower head

- o Equilibrator volume (L): 2 (air), 20 (seawater)

- o Water\_Flow\_Rate (L/min): 5

- o Headspace\_Gas\_Flow\_Rate (mL/min): 500

- o Equilibrator Vented:  Yes  No

- o Drying method for CO2 in water and extent of drying:

Thermoelectric cooling units followed by permeable membrane dryer and magn

- o Additional comments on equilibration:

- CO<sub>2</sub> in marine air method:

- o Measurement of CO2 in marine air (yes/no) & frequency:

Yes, every 30 minutes.

- Location and height of marine air intake: Bow tip, 6m.
- Drying method for CO<sub>2</sub> in air and extent of drying:

- CO<sub>2</sub> Sensors:

- Measurement Method CO<sub>2</sub>: Infra-red analysis on dry gas
- Manufacturer of CO<sub>2</sub> sensor: Fisher-Rosimount GmbH & Co.
- Model of CO<sub>2</sub> sensor: NGA2000/ML T3T-IR
- Frequency of CO<sub>2</sub> measurements (e.g. Every 120 sec, except during calibration routines):  
Every 30 minutes
- Accuracy of CO<sub>2</sub>water (specify parameter and unit):
- Precision of CO<sub>2</sub>water (specify parameter and unit):  
1.1 micro mol/mol (xCO<sub>2</sub>eq)
- Accuracy of CO<sub>2</sub>air (specify parameter and unit):
- Precision of CO<sub>2</sub>air (specify parameter and unit): 0.1 micro mol/mol (xCO<sub>2</sub>a)
- Calibration of CO<sub>2</sub> calibration gases (document traceability to an internationally recognized scale, including frequency of calibration, and location of calibrations):  
Frequency: Every 1 hour, Scale: WMO mole fraction scale
- CO<sub>2</sub> calibration gases (manufacturer, number and approximate mixing ratio of CO<sub>2</sub> standards, and frequency of calibration):

Japan Fine Products Co., Ltd. (Japan)

- Additional comments on CO<sub>2</sub> analysis:

CO<sub>2</sub> Calibration gases: 4 or 5 cylinders range from 215-435 micromol/mol

- CO<sub>2</sub> method references (publications describing method):

Hirota, M., Nemoto, K., Murata, A., and Fushimi, K. 1991. Observation of carbon dioxide in air and surface seawater in the western North Pacific Ocean. Oceanogr. Mag., 41, 19-28.

- Sea Surface Temperature (SST):

- Location and depth of SST sensor: Port sea-chest at the center in the longitudinal direction of a hull. Depth 5m.
- Manufacturer SST sensor: Sea-Bird Electronics, Inc.
- Model SST sensor: SBE3S
- Accuracy SST: 0.003 DEG\_C
- Precision SST:
- Calibration of SST (document traceability to an internationally recognized scale, including dates and location of calibrations):  
NIST-traceable calibration applying over the entire range.
- Additional comments on SST analysis:

- Equilibrator Temperature (T<sub>equ</sub>):

- Location of T<sub>equ</sub> sensor: Shower head
- Manufacturer T<sub>equ</sub> sensor: Sea-Bird Electronics, Inc.
- Model T<sub>equ</sub> sensor: SBE-21
- Accuracy T<sub>equ</sub>: +/-0.01 degreeC
- Precision T<sub>equ</sub>:
- Calibration of T<sub>equ</sub> (document traceability to an internationally recognized scale, including dates and location of calibrations):
- Average warming of water from seawater inlet to equilibrator with standard deviation:  
0.36 +/- 0.22 DEG\_C
- Additional comments on T<sub>equ</sub> analysis:

- Equilibrator Pressure ( $P_{\text{equ}}$ ):
  - Location of  $P_{\text{equ}}$  sensor:
  - Manufacturer  $P_{\text{equ}}$  sensor:
  - Model  $P_{\text{equ}}$  sensor:
  - Accuracy  $P_{\text{equ}}$ :
  - Precision  $P_{\text{equ}}$ :
  - Calibration of  $P_{\text{equ}}$  (document traceability to an internationally recognized scale, including dates and location of calibrations):
  - Additional comments on  $P_{\text{equ}}$  analysis:

- Atmospheric Pressure (sea level) ( $P_{\text{atm}}$ ):
  - Location and height of  $P_{\text{atm}}$  sensor:
  - Manufacturer  $P_{\text{atm}}$ :
  - Model  $P_{\text{atm}}$ :
  - Accuracy  $P_{\text{atm}}$  (specify unit):
  - Precision  $P_{\text{atm}}$  (specify unit):
  - Calibration of  $P_{\text{atm}}$  (document traceability to an internationally recognized scale, including dates and location of calibrations):
  - Additional comments on  $P_{\text{atm}}$  analysis:

- Sea Surface Salinity (SSS):
  - Location and depth of SSS sensor:
  - Manufacturer SSS sensor:
  - Model SSS sensor:
  - Accuracy SSS:
  - Precision SSS:
  - Calibration of SSS (document traceability to an internationally recognized scale, including dates and location of calibrations):
  - Additional comments on SSS analysis:

- Other Sensors # 1:
  - Manufacturer:
  - Accuracy:
  - Model:
  - Precision:
  - Calibration (For each sensor of pressure, temperature, and salinity, document traceability to an internationally recognized scale, including date and place of the last calibration):
  - Additional Information:

• Add More Sensors:  ▾

**Additional Information:**

**Data Set References: (Publication(s) describing data set)**

Inoue, H. Y., Ishii, M., Matsueda, H., Saito, S., Midorikawa, T., and Nemoto, K. 1999. MRI measurements of partial pressure of CO<sub>2</sub> in surface waters of the Pacific during 1968 to 1970: re-evaluation and comparison of data with those of 1980s and 1990s. Tellus, 51B, 830-848.

**Citation: (How to cite this data set)**

Saito, S. and A. Nakadate. 2014. Underway air and surface seawater pCO<sub>2</sub> data measured on board the R/V Keifu Maru during the 2001-2012 cruises.  
[http://cdiac.ornl.gov/ftp/oceans/VOS\\_Keifu\\_Maru\\_Line\\_V2/KeifuMaru\\_2001\\_2012](http://cdiac.ornl.gov/ftp/oceans/VOS_Keifu_Maru_Line_V2/KeifuMaru_2001_2012). Carbon Dioxide Information Analysis Center, Oak Ridge

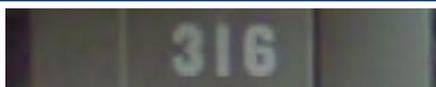
**Append Measurement or Calibration reports here:**

**Data Set Link:**

- URL:
- Label:
- Link Note (Optional instructions or remarks):

Attach Files (\* Please note that files will only be uploaded to the ORNL server by clicking 'Submit' button):

<input type="button" value="ファイルを選択"/>	選択されていません	<input type="text" value="ftp://cdiac.ornl.gov/incoming/ocean.co2/forms/KeifuMaru120140302_22_03_94.csv"/>
<input type="button" value="ファイルを選択"/>	選択されていません	<input type="text"/>
<input type="button" value="ファイルを選択"/>	選択されていません	<input type="text"/>
<input type="button" value="ファイルを選択"/>	選択されていません	<input type="text"/>



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