

Plate Boundary Models in and around Japan

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A. Download site : http://evrrss.eri.u-tokyo.ac.jp/database/PLATEmodel/PLMDL_2016/

This site is composed of the following directories.

/Trench

/PAC_Plate

/Base model

xyz file (ascii)

grid file

/contour

contour line files (ascii)

/Regional model

xyz file (ascii)

grid file

/contour

contour line data (ascii)

/PHS Plate

/Base model

xyz file (ascii)

grid file

/contour

contour line data (ascii)

/Regional model

xyz file (ascii)

grid file

/contour

contour line data (ascii)

B. Model region : 12°-54° N and 118°-164° E (Fig.1).

C. Trench axis data :

Explanations

Trench axis data are composed of longitude, latitude (degree) and water depth (m).
This data, originally obtained from bathymetry data, were smoothed by spline interpolation (Fig.1)

Directory: **/Trench**

Files

japan_trench_pos: Kuril-Japan-Izu-Bonin-Mariana trench
nankai_trough_pos: Sagami-Suruga-Nankai trough-Ryukyu trench
manila: Manila trench
philippine: Philippine trench
ryukyu_taiwan: tectonic boundary from the southernmost ryukyu trench to Taiwan
manila_philippine: tectonic boundary connecting southernmost Manila trench to the northernmost Philippine trench.

D. Plate surface data

Explanation

- (1) Models for Pacific (PAC) plate and Philippine Sea (PHS) plate were prepared.
(Figs.2 and 3).
- (2) Base model
Plate surfaces are determined from earthquake distribution (the Wadati-Benioff zones).
- (3) Regional model
Base models around Japan were corrected using results from seismic profiling, seismic tomography and natural earthquake observation.
- (4) Each model provides plate surface positions (longitude, latitude (degree) and depth (km)) with 0.025° grid size. Depth values are taken negative below the sea level.
- (5) Grid data in areas where reliable plate surface is not defined are eliminated
(for example, PHS plate surface in the Kanto and Chugoku areas).
- (6) Both the ascii (~.xyz) and binary (~.grd) data are prepared.

- (7) For each plate model, positions of equi-depth line (countour line) are prepared in ascii format (directory: **contour**). Users can define their own plate model (subducted part) from these data and trench axis data using an appropriate interpolation technique.

Directory: **/PAC_Plate** (Pacific plate model)

Base model

directory **/base_model**

files

pac_2017_3a.xyz

pac_2017_3a.grd

contour line data

directory **/contour**

files: pac1_cntr_10.bs ~ pac1_cntr_650.bs

Regional model

directory **/regional_model**

files

pac_2017_4a.xyz

pac_2017_4a.grd

contour line data

directory **/contour**

files: pac1_cntr_10.rg ~ pac1_cntr_650.rg

Directory: **/PHS_Plate** (Philippine Sea plate model)

Base model

directory **/base_model**

files

phs_2015_4a_r_2017xyz

phs_2015_4a_r_2017.grd

contour line data

directory **/contour**

files: phs1_cntt_10.bs ~ phs1_cntt_300.bs

Regional model

directory /**regional_model**

files

phs_2015_5a_r_2017.xyz

phs_2015_5a_r_2017.grd

contour line data

directory /**contour**

files: phs1_cntt_10.rg ~ phs1_cntt_300.rg

E. Topography/Bathymetry data used in our plate models

In constructing our plate model, we used the topography and bathymetry data provided from the following institutes.

- (1) Geospatial Information Authority of Japan (250-m digital map)
(permission No. H29-JoShi-17) .
- (2) Japan Oceanographic Data Center (500m mesh bathymetry data, J-EGG500,,
http://www.jodc.go.jp/jodcweb/JDOSS/infoJEGG_j.html).
- (3) Geographic Information Network of Alaska, University of Alaska (Global
Topo/Bathymetry Grid (Lindquist, et al., 2004, see also “F”).

F. How to refer these plate models

- (1) If users present/publish their own results, please refer the following references.

Iwasaki, T., Sato, H., Shinohara, M., Ishiyama, T. & Hashima, A., 2015. Fundamental structure model of island arcs and subducted plates in and around Japan, 2015 Fall Meeting, American Geophysical Union, San Francisco, Dec. 14-18, T31B-2878.

Lindquist, K. G., K. Engle, D. Stahlke, and E. Price (2004), Global Topography and Bathymetry Grid Improves Research Efforts, Eos Trans. AGU, 85(19), 186.
<http://onlinelibrary.wiley.com/doi/10.1029/2004EO190003/abstract>

- (2) In “Acknowledgement” in users’ presentation/paper, add the following description to make clear the institutes which provided topography/bathymetry data).

The plate models by Iwasaki et al. (2015) were constructed from topography and bathymetry data

by Geospatial Information Authority of Japan (250-m digital map), Japan Oceanographic Data Center (500m mesh bathymetry data, J-EGG500,,
http://www.jodc.go.jp/jodcweb/JDOSS/infoJEGG_j.html) and Geographic Information Network of Alaska, University of Alaska (Lindquist et al., 2004).

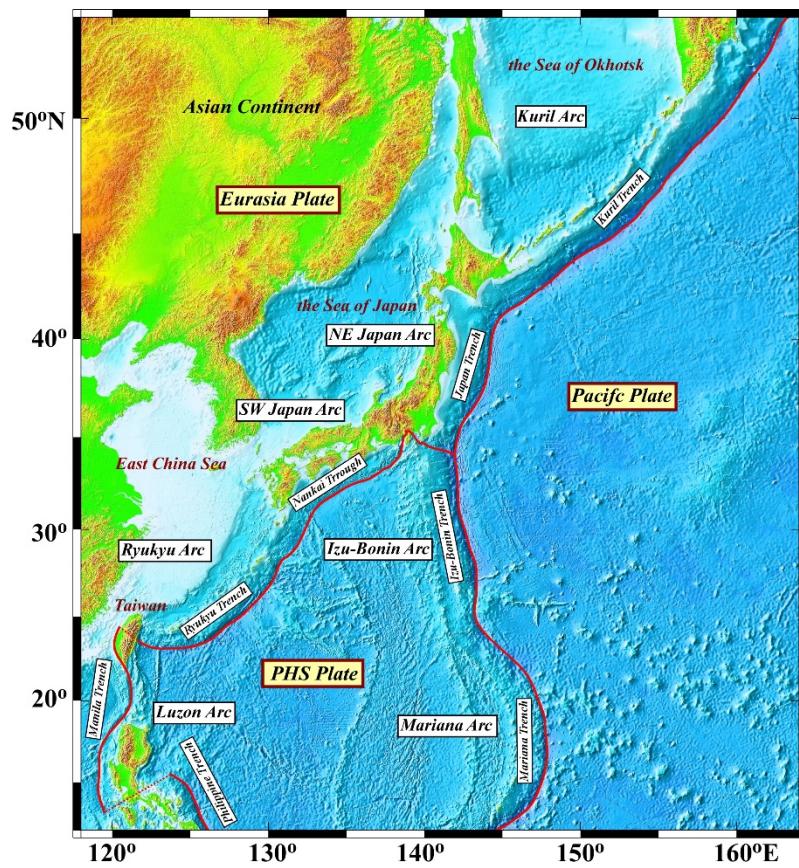


Fig.1. Topography and trench-axis models.

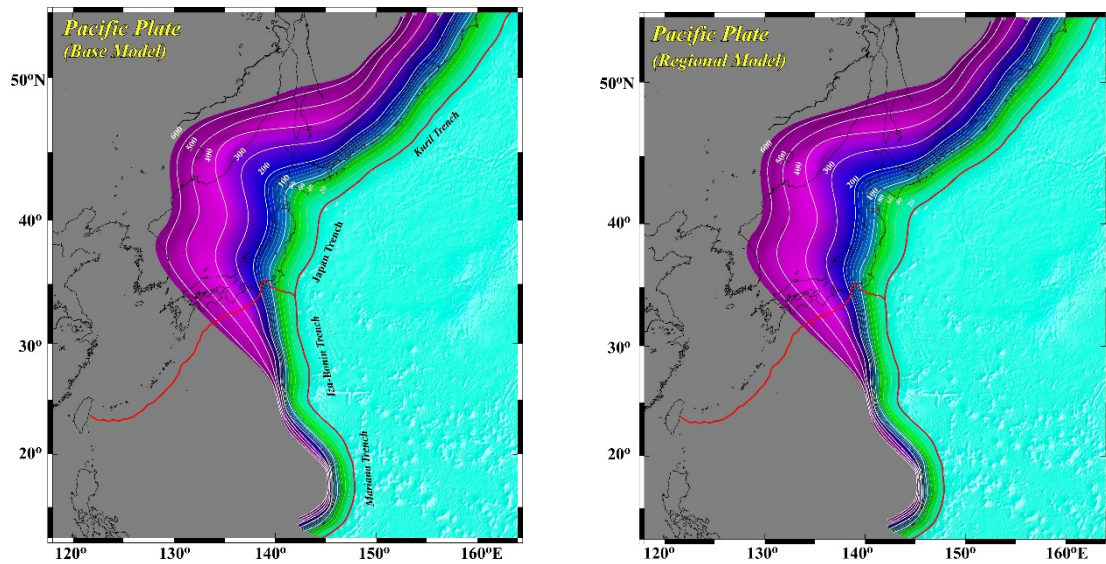


Fig.2 Base model and regional model for the PAC plate.

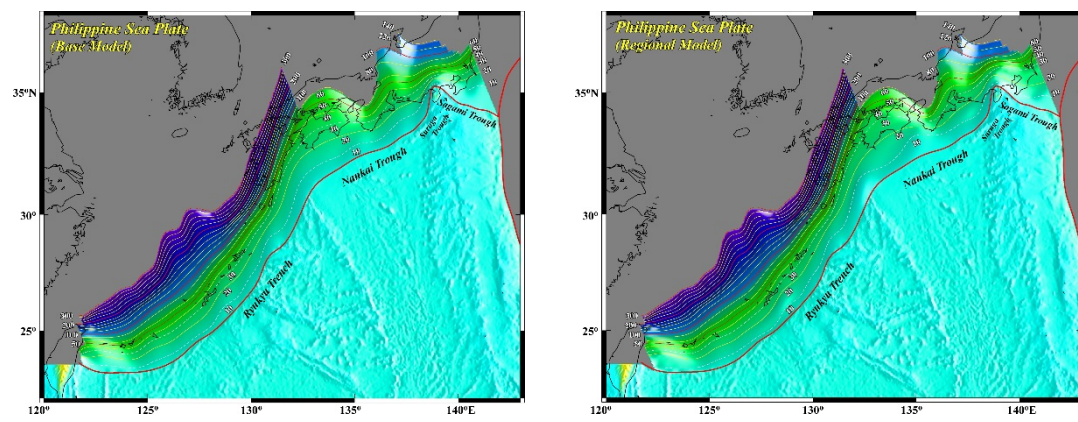


Fig.3 Base model and regional model for the PHS plate.