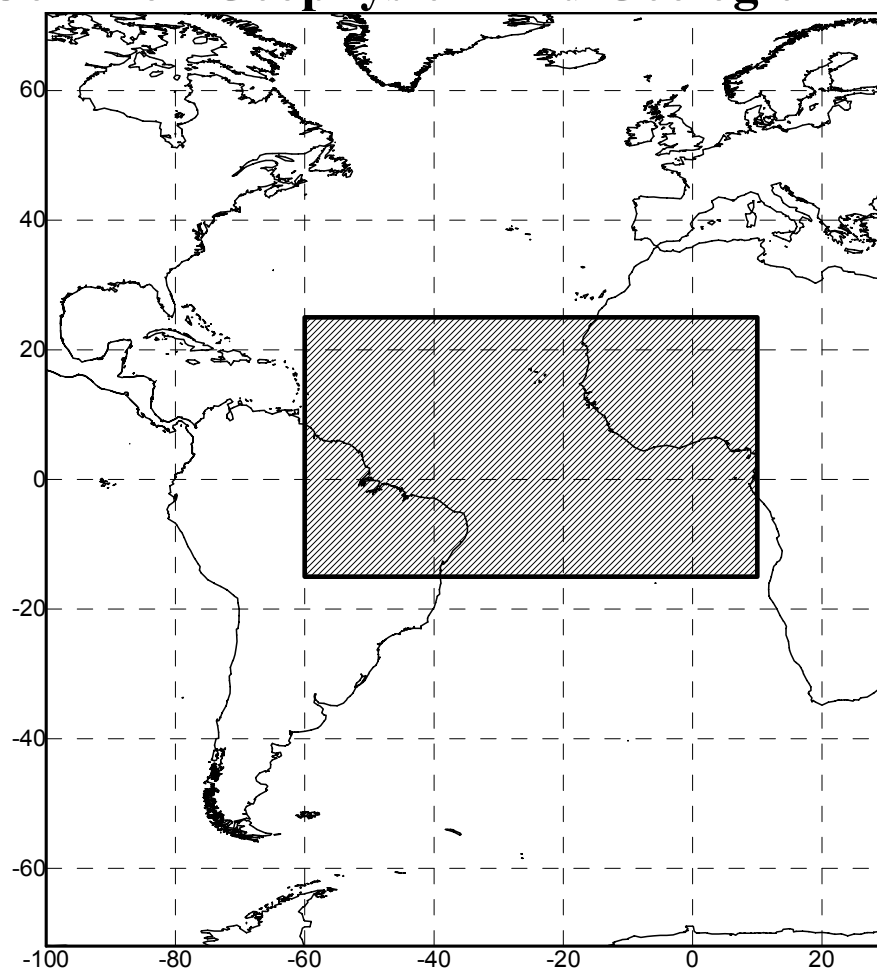




Geological-Geophysical Atlas of the Central Atlantic Ocean

Volume I

Common Geophysical and Geological Data



©1999-2013, Geological Institute RAS.

®Laboratory of Geomorphology And Ocean Floor Tectonics.
Moscow

Contents

List 1.

Scheme of Surveys and Stations at Central Atlantic Conducted by Geological Institute RAS. *Sokolov S.Yu., Mazarovich A.O., Efimov V.N.*

List 2.

Physical-Geographical Map of Central Atlantic. *Mazarovich A.O., Agapova G.V., Sokolov S.Yu., Turko N.N.*

List 3.

Bottom Topography of Central Atlantic from Sattelite Altimetry Data and Topography of Adjacent Continents. *Sokolov S.Yu.*

List 4.

Joint Free Air Gravity Field Anomalies of Central Atlantic and Adjacent Continents. *Sokolov S.Yu.*

List 5.

The Structure of Sedimentary Cover of Central Atlantic. *Sokolov S.Yu., Mazarovich A.O., Efimov V.N.*

List 6.

Mesozoic-Cenozoic Magmatism and Crust Age of Central Atlantic. *Mazarovich A.O., Sokolov S.Yu., Dobrolyubova X.O.*

List 7.

Seismicity, Heatflow and Magnetic Anomalies of Central Atlantic. *Sokolov S.Yu., Podgornykh L.V. (VNIIOkeanogeologiya), Khutorskoy M.D. (RUDN)*

List 8.

Earthquakes Focal Mechanisms, Slip Vectors and Geoid Surface of Central Atlantic. *Sokolov S.Yu.*

List 9.

Bouguer Anomalies Calculated from Altimetry and Bathymetry Data on 5'x5' Grid. *Sokolov S.Yu.*

List 10.

Bouguer Anomalies Calculated from Altimetry and Bathymetry Data on 5'x5' Grid with Correction by the Sedimentary Cover Effect. *Sokolov S.Yu.*

List 11.

Isostatic Anomalies Estimated from Altimetry and Bathymetry Data on 5'x5' grid by Airy model. *Sokolov S.Yu.*

List 12.

Basement Rocks of Central Atlantic from Dredge Stations. *Mazarovich A.O.*

List 13.

Alternations of Basement Rocks of Central Atlantic and Its Rare Types. *Mazarovich A.O.*

List 14.

Tectonic Map of Central Atlantic. *Mazarovich A.O., Dobrolyubova X.O.*

List 15.

Legend to Tectonic Map of Central Atlantic. *Maza-rovich A.O.*

List 16.

Distribution of basic petrological types of oceanic rifts tholeite basalts (TOR), seismic S-wave tomography and thier correlation with free air gravity anomalies at the area of Central Atlantic Ocean. *Dmitriev L.V. (GEOKHI RAS), Sokolov S.Y., Plechova A.A. (GEOKHI RAS), Sokolov N.S. (MSU)*

List 17.

Mantle Bouguer Anomalies Calculated from Altimetry and Bathymetry Data on 5'x5' Grid with Correction to Sedimentary Cover and Total Mantle Depth Effects. *Sokolov S.Yu.*

List 18.

Regional Component of Mantle Bouguer Anomalies, Smoothed in 65 km Window. *Sokolov S.Yu.*

List 19.

Local Component of Mantle Bouguer Anomalies (residual filed at wavelength less than 65 km). *Sokolov S.Yu.*

List 20.

Conventional density variations in crust layer. *Sokolov S.Yu., Mazarovich A.O.*

List 21.

Horizontal gradient of gravity isostatic anomalies. *Sokolov S.Yu.*

List 22.

Horizontal gradient of gravity isostatic anomalies. *Sokolov S.Yu.*

List 23.

Anomalous magnetic field. *Sokolov S.Yu.*

List 24.

Magnetization. *Sokolov S.Yu.*

List 25.

Acoustic basement and deep seismic sounding data. *Sokolov S.Yu.*

List 26.

Thickness of sediments between bottom and reflection horizon D (~25 Ma) and linear magnetic anomalies. *Sokolov S.Yu.*

List 27.

Thickness of sediments between reflection horizons D and Ac (from ~25 Ma to ~49 Ma) and linear magnetic anomalies. *Sokolov S.Yu.*

List 28.

Thickness of sediments between reflection horizons Ac and A* (from ~49 Ma to ~68 Ma) and linear magnetic anomalies. *Sokolov S.Yu.*

List 29.

Thickness of sediments between reflection horizons A* and β (from ~68 Ma to ~112 Ma) and linear magnetic anomalies. *Sokolov S.Yu.*

List 30.

Thickness of sediments between reflection horizons β and J (from ~112 Ma to ~129 Ma) and linear magnetic anomalies. *Sokolov S.Yu.*

List 31.

Thickness of sediments between reflection horizon J and acoustic basement (from ~129 Ma) and linear magnetic anomalies. *Sokolov S.Yu.*

List 32.

Cluster combinations of geophysical parameters with geodynamical interpretation. *Sokolov S.Yu., Sokolov N.S.*

Data Sources

1. GEBCO-97 Digital Atlas CD. IHO. Natural Environment Research Council.
2. Deep Sea Drilling Project CD. NOAA Product # G01336-CDR-A0001.
3. Ocean Drilling Program CD. NOAA Product # G01013-CDR-A0001.
4. Sandwell D.T., Smith W.H.F. Marine Gravity Anomaly from Geosat and ERS-1 Satellite Altimetry. // J. geophys. Res. 1997. Vol. 102. N B5. p. 10039-10054. (<ftp://topex.ucsd.edu/pub/>)
5. ETOPO5 Set. Global Relief Data CD. NOAA Product # G01093-CDR-A0001.
6. Marine Trackline Geophysical Data CD. NOAA Product # G01321-CDR-A0001.
7. Agapova G.V., Vinogradova N.V., Kashnikova I.P. Dictionary of Undersea Feature Names. M.: Geological Institute RAS. 1993. 311 p.
8. Gazetteer of Undersea Feature Names. 2-nd Edition. IHO. IOC. Monaco. 1997. 123 p.
9. Atlas of Oceans: Atlantic and Indian Oceans.//Ed. by Gorshkov S.G. GUNIO. DM USSR. 1977. 306 p.

10. International Geological-Geophysical Atlas of Atlantic Ocean.//Ed. Udintsev G.B. IHO (UNESCO). USSR Ministry of Geology. USSR Academy of Sciences. GUGK USSR. Moscow. 1990. 158 p.
11. Smith W. H. F., Sandwell D. T. Global Seafloor Topography from Satellite Altimetry and Ship Depth Soundings. *Science* 1997 Sept. 26. 277 (5334). (<ftp://topex.ucsd.edu/pub/>, <http://edcwww.cr.usgs.gov/landdaac/gtopo30/>)
12. EGM96 Joint Earth Geopotential Model. NASA-NIMA. 1996. (<http://cddis.gsfc.nasa.gov/926/egm96/egm96.html>)
13. GTOPO30 Global Digital Elevation Model. EROS Data Center. 1996. (<http://edcwww.cr.usgs.gov/landdaac/gtopo30/gtopo30.html>).
14. ArcWorld 1:3M. ESRI ArcDATA set CD. 1992.
15. Mueller R.D., Roest W.R., Royer J.-Y., Gahagan L.M., Sclater J.G. Digital age map of the ocean floor. SIO Reference Series 93-30. (ftp://baltica.ucsd.edu/pub/global_age/)
16. Carte tectonique internationale de l'Afrique. 1:5000000. A.A.G.A. UNESCO. 1968.
17. Tectonic Map of South America. 1:5000000. DNPM-CGMW-UNESCO. 1978
18. Lemoine F.G. et al. The Development of the NASA GSFC and DMA Joint Geopotential Model. International Symposium on Gravity, Geoid and Marine Geodesy (GraGeoMar96). Univ. of Tokyo. Tokyo. Japan. Sept. 30 - Oct. 5. 1996. Geoid Undulation Grid from EGM96. NASA-NIMA. 1996. (<http://cddis.gsfc.nasa.gov/926/egm96/egm96.html>)
19. Harvard University Centroid-Moment Tensor Catalog. December 1997. (<http://www.seismology.harvard.edu/CMTsearch.html>)
20. Louvari E.K., Kiratzi A.A. RAKE: a windows program to plot earthquake focal mechanisms and the orientation of principal stresses. *Computers & Geosciences*. 1997. vol.23. no.8 pp. 851-857.
21. Cande S.C., LaBrecque J.L., Larson R.L., Pitman W.C. III, Golovchenko X., Haxby W.F. Magnetic Lineations of World's Ocean Basins (map), Amer. Ass. Petrol. Geol., Tulsa. OK. 1989. Digitized Set by G. Cole, 1993. Global Relief Data CD. NOAA Product # 1093-A27-001.
22. CNSS Earthquake Composite Catalog. June 1997 (<http://quake.geo.berkeley.edu/cnss/>)
23. Pollack H.N., Hurter S.J., Johnson J.R. New Global Heat Flow Compilation. Univ. Of Michigan. Dep. Of Geol. Sciences. Ann Arbor. Michigan 48109-1063. USA. 1991.
24. Maus S., Rother M., Holme R., Luhr H., Olsen N., Haak V. First scalar magnetic anomaly map from CHAMP satellite data indicates weak lithospheric field. *Geophysical Research Letters*. V. 29. N 14. 10.1029/2001 GL013685. 2002. (<http://www.gfz-potsdam.de/pb2/pb23/SatMag/litmod3.html>)
25. Tucholke B.E., Uchupi E. Thickness of Sedimentary Cover. // International Geological-Geophysical Atlas of Atlantic Ocean. Ed. Udintsev G.B. IHO (UNESCO). USSR Ministry of Geology. USSR Academy of Sciences. GUGK USSR. Moscow. 1990. p.122-125.
26. Laske G., Masters G. A Global Digital Map of Sediment Thickness. *EOS Trans. AGU*. 78. F483. 1997. (<http://mahi.ucsd.edu/Gabi/sediment.html>)
27. Lamont-Doherty Earth Observatory. Deep-Sea Sample Repository. Search from September 1, 1998. (http://www.ldeo.columbia.edu/CORE_REPOSITORY/RHP1.html)
28. Hannington M. Hydrothermal Vent Database. Inter-Ridge Databases. 2001. (<http://triton.ori.u-tokyo.ac.jp/~intridge/data1.html>)
29. Zoback M. L., Burke K. World Stress Map. *EOS*. 1993. WSM Database – 2001. (http://www-wsm.physik.uni-karlsruhe.de/pub/stress_data/stress_data_frame.html)
30. Grand S.P., van der Hilst R.D., Widiyantoro S., Global seismic Tomography: A snapshot of convection in the Earth, *GSA Today* ,7 ,1 –7, 1997.
31. Dmitriev L.V., Sokolov S.Y., Plechova A.A. Statistical Assessment of Variations in the Compositional and P-T Parameters of the Evolution of Mid-Oceanic Ridge Basalts and Their Regional Distribution // *Petrology*. 2006. Vol.14. #3. P.227-247.
32. Klein E.M., Langmuir C.H. Global correlation of ocean ridge basalt chemistry with axial depth and crustal thickness // *Journal Geophysical Research*. 1987. B-92. P. 8089-8115.

33. Dmitriev L.V., Sokolov S.Yu., Melson W. G., O'Hirn T. Plum and Spreading Basaltic Associations and their Reflection in Petrological and Geophysical Parameters of Mid Atlantic Ridge Northern Part. // Russian Journal of Earth Sciences. 1999. November. V. 1. #. 6. P. 457-476.
34. Sokolov S.Yu., Mazarovich A.O. Gas Hydrates in the Sedimentary Cover of Passive Oceanic Margins: Possibilities of Prediction Based on Satellite Altimetry Data in the Atlantic and Arctic // Lithology and Mineral Resources. 2009. Vol. 44. No. 5. pp. 441–450.
35. Sandwell D.T., Smith W.H.F. Marine Gravity from Geosat and ERS 1 Satellite Altimetry // J. Geophys. Res. 1997. V. 102. N. B5. P. 10039-10054
36. GPS Time Series Data. Jet Propulsion Laboratory of California Institute of Technology. 2008. (<http://sideshow.jpl.nasa.gov/mbh/series.html>)
37. Maus S. et al. EMAG2: A 2-arc-minute resolution Earth Magnetic Anomaly Grid compiled from satellite, airborne and marine magnetic measurements // Geochemistry Geophysics Geosystems (G3), 10, Q08005. 2009. Vol.10. N.8.
38. Larson E., Ekström G., Tromp J., 1999, Seismology group, Department of Earth and Planetary Sciences, Harvard University, <http://www.seismology.harvard.edu>
39. Maus S., Rother M., Holme R., Luhr H., Olsen N., Haak V. First scalar magnetic anomaly map from CHAMP satellite data indicates weak lithospheric field // Geophysical Research Letters, VOL. 29, NO. 14, 10.1029/2001GL013685, 2002
40. Deep Seismic Sounding of the Lithosphere on Angolo-Brazilian Geotraverse. M.: UIFZ RAS, 1996. 108 p.
41. Panaev V.F., Mitulov S.N. Seismic stratigraphy of Atlantic ocean Sedimentary cover. M.: Nedra, 1993. 247 p.
42. Sokolov S.Y. Condition of geodynamic mobility in mantle based on data from seismic tomography and P and S waves velocity ratio // Bulletin of Kamchatka Regional Association "Educational-Scientific Center". Earth Sciences. 2014. № 2 (24). C. 55-67.
43. Sokolov S.Yu., Sokolov N.S., Dmitriev L.V. Geodynamic zonation of the Atlantic Ocean lithosphere: Application of cluster analysis procedure and zoning inferred from geophysical data // Russian Journal of Earth Sciences. 2008. V. 10. ES4001, doi:10.2205/2007ES000218. P.1-30