

8th
International
Conference on
Cartography & GIS

+ Seminar on Disaster Risk Reduction -
Solutions and Innovations

Nessebar, Bulgaria
14-19 June 2021
Postponed to 20-25 June 2022

201CC
20GIS

ICCGIS
News
Organizers
Programme
Registration
Submission
Proceedings
Venue
Contacts

ИТТЗ РАН
IEPT

Institute of earthquake prediction theory
and mathematical geophysics

Russian academy of sciences



Seminar on Disaster Risk Reduction – Solutions and Innovations

WEB-GIS PROJECTS AT THE INSTITUTE OF EARTHQUAKE PREDICTION THEORY AND MATHEMATICAL GEOPHYSICS, RUSSIAN ACADEMY OF SCIENCES

<https://www.itpz-ran.ru/en/>

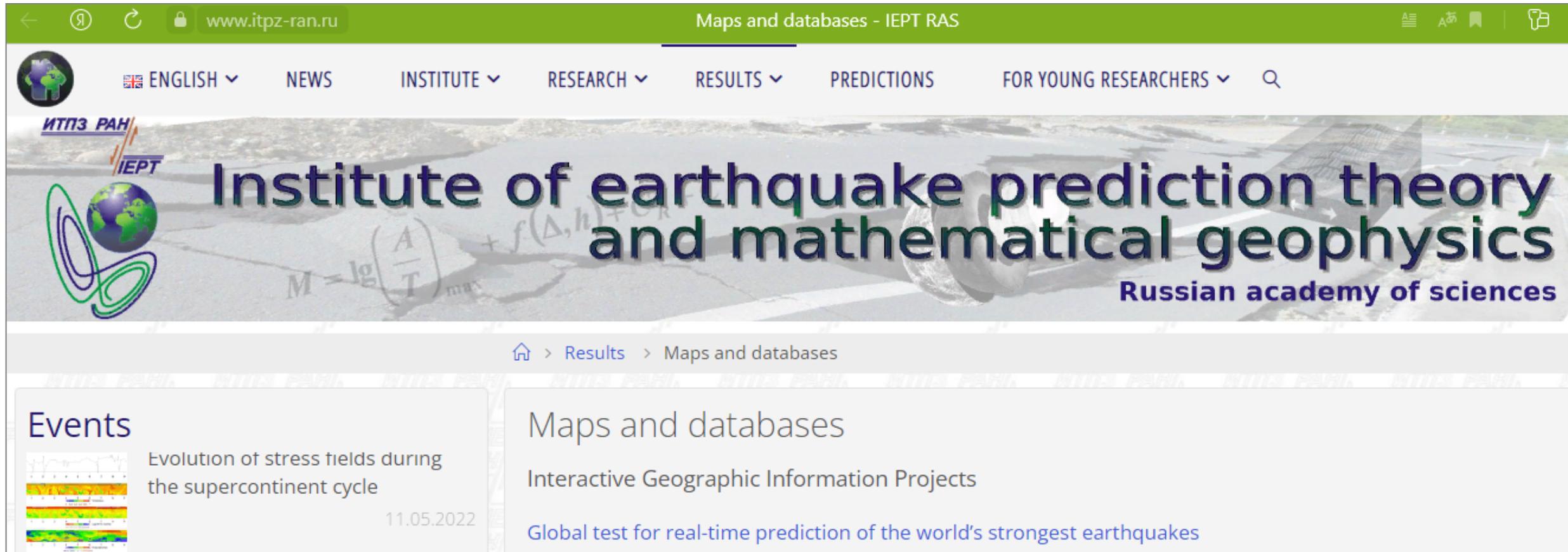
**Ekaterina Podolskaia*^{1,2,3}, Anastasia Nekrasova¹,
Tatiana Prokhorova¹, Aleksey Trubenkov¹, Olga Selyutskaya¹**

1 Institute of Earthquake Prediction Theory and Mathematical Geophysics, Russian Academy of Sciences (IEPT RAS), Moscow, Russia

2 Center for Forest Ecology and Productivity, Russian Academy of Sciences (CEPF RAS), Moscow, Russia

3 Federal State Budget Educational Institution of Higher Education “MIREA – Russian Technological University”, Moscow, Russia

22 June 2022



www.itpz-ran.ru Maps and databases - IEPT RAS

ENGLISH NEWS INSTITUTE RESEARCH RESULTS PREDICTIONS FOR YOUNG RESEARCHERS

Institute of earthquake prediction theory and mathematical geophysics

Russian academy of sciences

Home > Results > Maps and databases

Events

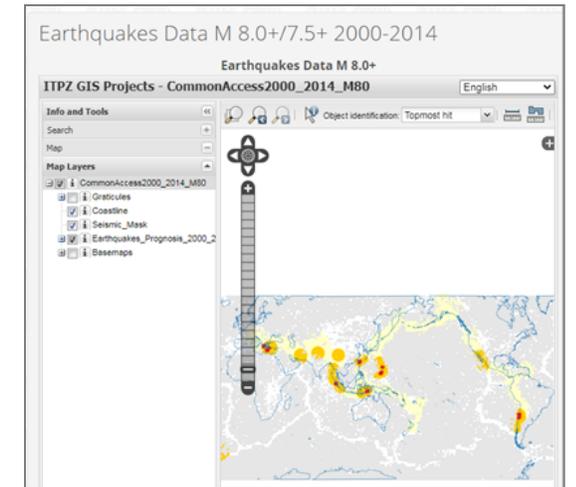
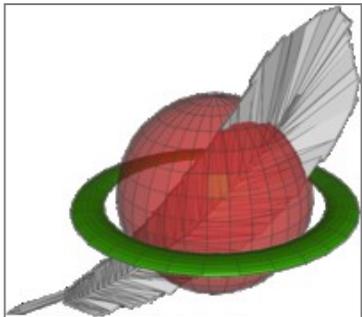
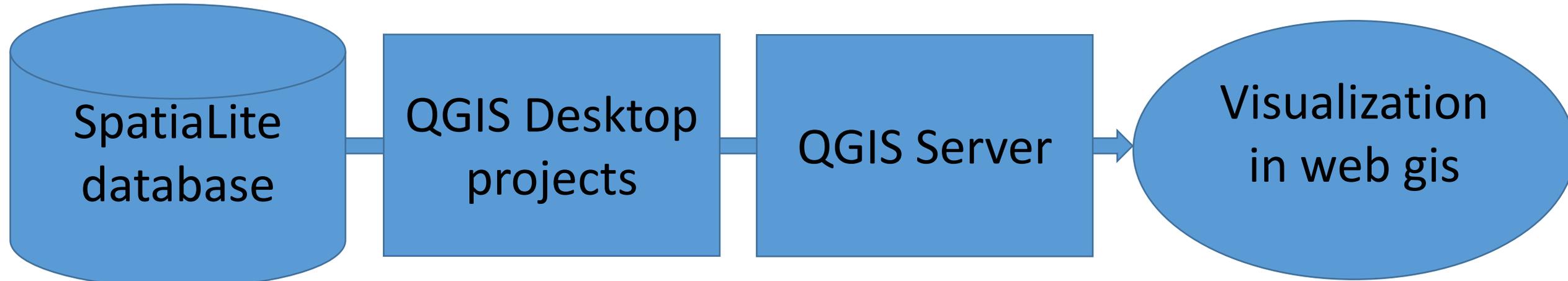
Evolution of stress fields during the supercontinent cycle 11.05.2022

Maps and databases

- Interactive Geographic Information Projects
- Global test for real-time prediction of the world's strongest earthquakes

<https://www.itpz-ran.ru/en/>
<https://www.itpz-ran.ru/en/results/maps-and-databases/>

Architecture of web-gis application

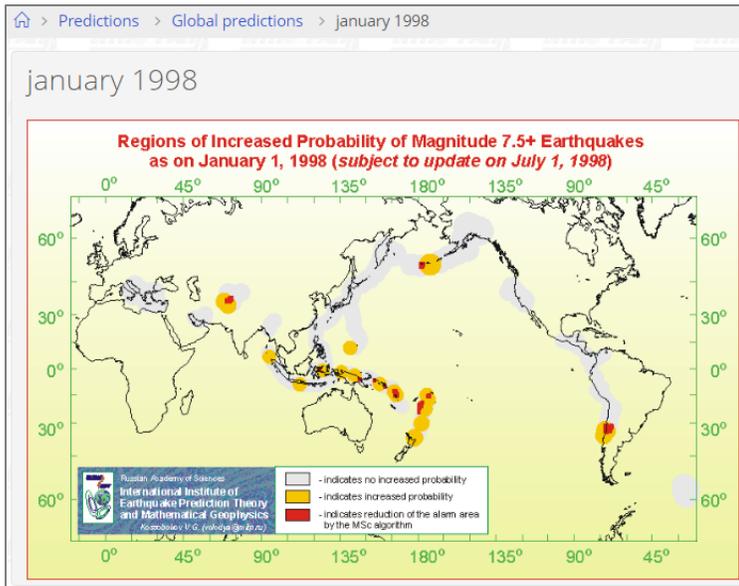


Project 1: Global test for real-time prediction of the world's strongest earthquakes

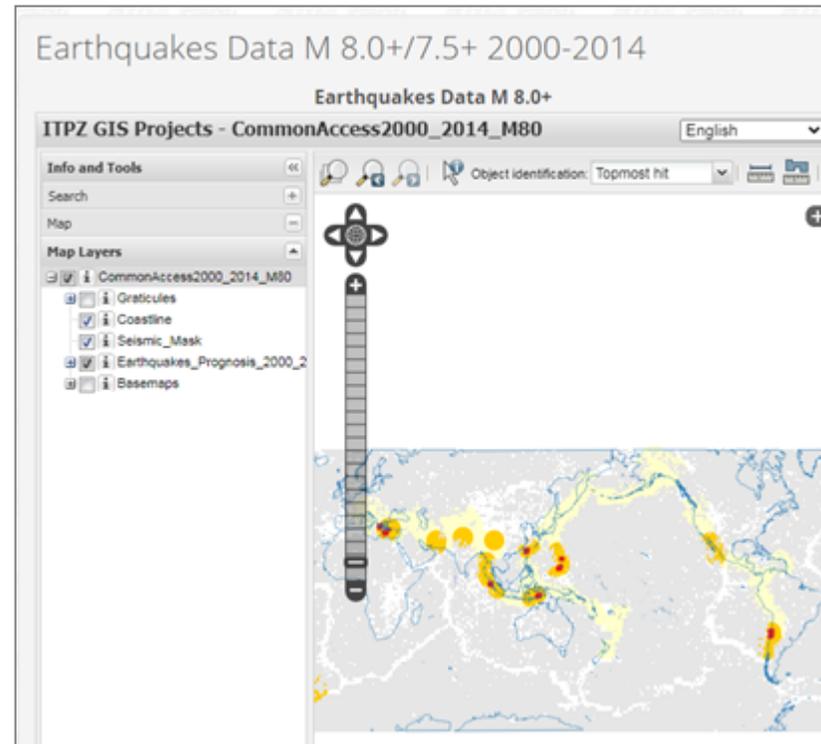
1985-1999

<https://www.itpz-ran.ru/en/predictions/global-predictions/january-1998-2/>

PREDICTIONS OF MAGNITUDE 8.0+ EARTHQUAKES (Circles of Investigation used)		PREDICTIONS OF MAGNITUDE 7.5+ EARTHQUAKES (Circles of Investigation used)	
As on January 1, 1985	As on July 1, 1985	As on January 1, 1985	As on July 1, 1985
As on January 1, 1986	As on July 1, 1986	As on January 1, 1986	As on July 1, 1986
As on January 1, 1987	As on July 1, 1987	As on January 1, 1987	As on July 1, 1987
As on January 1, 1988	As on July 1, 1988	As on January 1, 1988	As on July 1, 1988
As on January 1, 1989	As on July 1, 1989	As on January 1, 1989	As on July 1, 1989
As on January 1, 1990	As on July 1, 1990	As on January 1, 1990	As on July 1, 1990
As on January 1, 1991	As on July 1, 1991	As on January 1, 1991	As on July 1, 1991
As on January 1, 1992	As on July 1, 1992	As on January 1, 1992	As on July 1, 1992
As on January 1, 1993	As on July 1, 1993	As on January 1, 1993	As on July 1, 1993
As on January 1, 1994	As on July 1, 1994	As on January 1, 1994	As on July 1, 1994
As on January 1, 1995	As on July 1, 1995	As on January 1, 1995	As on July 1, 1995
As on January 1, 1996	As on July 1, 1996	As on January 1, 1996	As on July 1, 1996
As on January 1, 1997	As on July 1, 1997	As on January 1, 1997	As on July 1, 1997
As on January 1, 1998	As on July 1, 1998	As on January 1, 1998	As on July 1, 1998
As on January 1, 1999	As on July 1, 1999	As on January 1, 1999	As on July 1, 1999



2000-2014 and 2015+



Ismail-Zadeh A., Kossobokov V. Earthquake Prediction, M8 Algorithm // Encyclopedia of Solid Earth Geophysics. Encyclopedia of Earth Sciences Series / Gupta H. (ed). Springer, Cham, 2021. P. 204-208. DOI:10.1007/978-3-030-10475-7_157-1 and references in it

<https://www.itpz-ran.ru/ru/resultaty/maps-and-databases/global-test/earthquakes-data-m-8-0-7-5-2000-2014/>

Earthquakes Data M 8.0+/7.5+ 2015

This content is password protected. To view it please enter your password below:

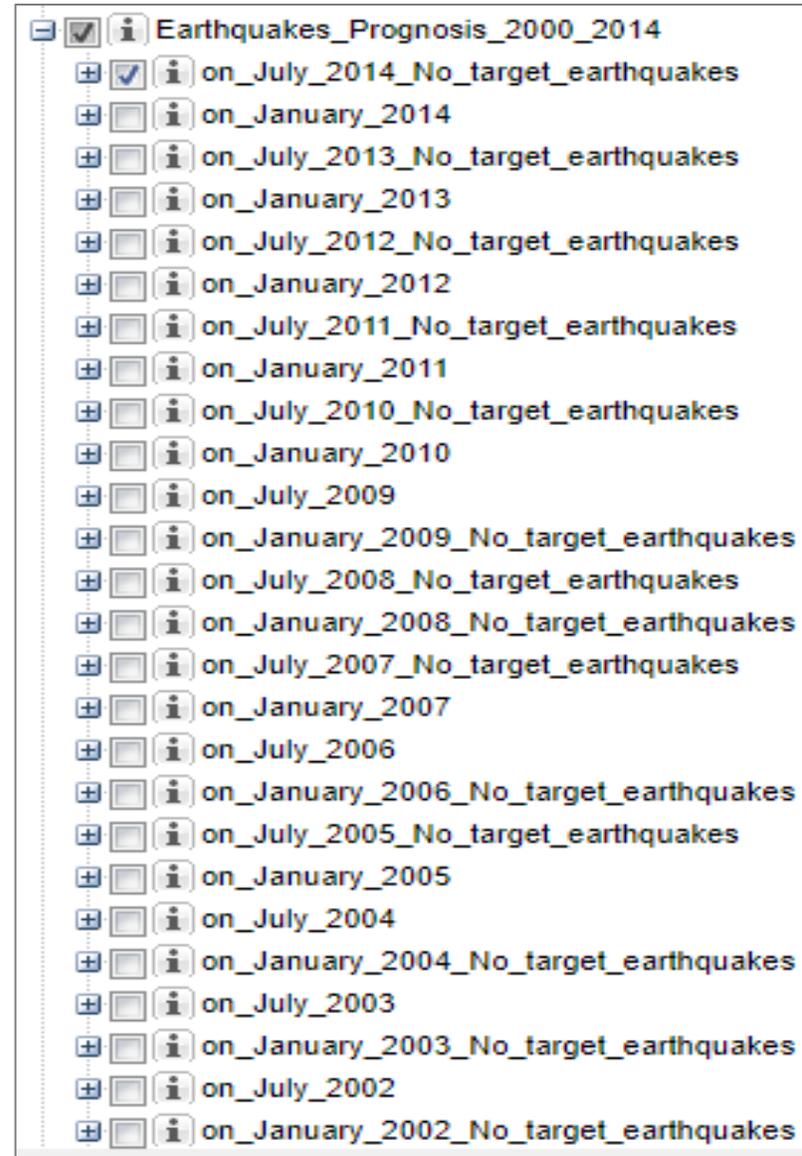
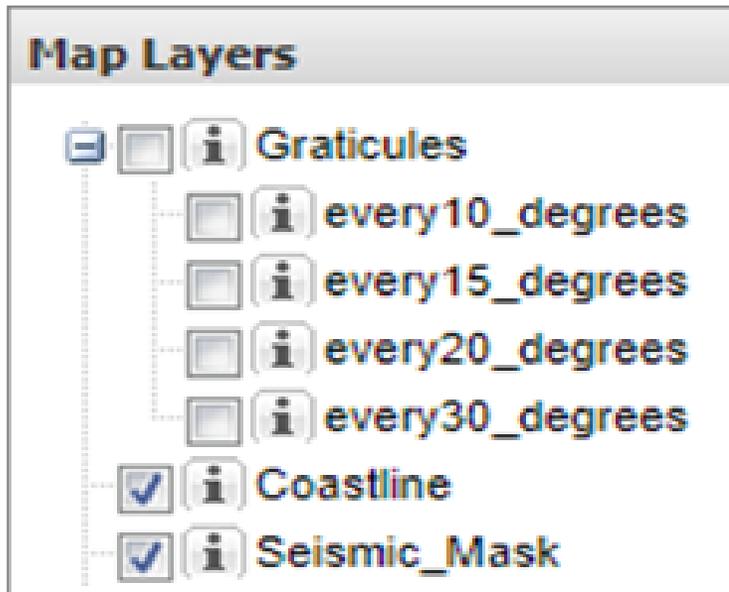
Password:

<https://www.itpz-ran.ru/ru/resultaty/maps-and-databases/global-test/earthquakes-data-m-8-0-7-5-2015/>

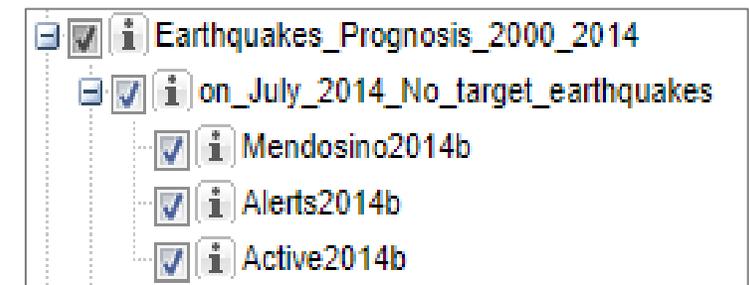
Project 1: Global test for real-time prediction of the world's strongest earthquakes

Layers for M 8.0 for 2000-2014 (open access)

Common layers for all sub-projects

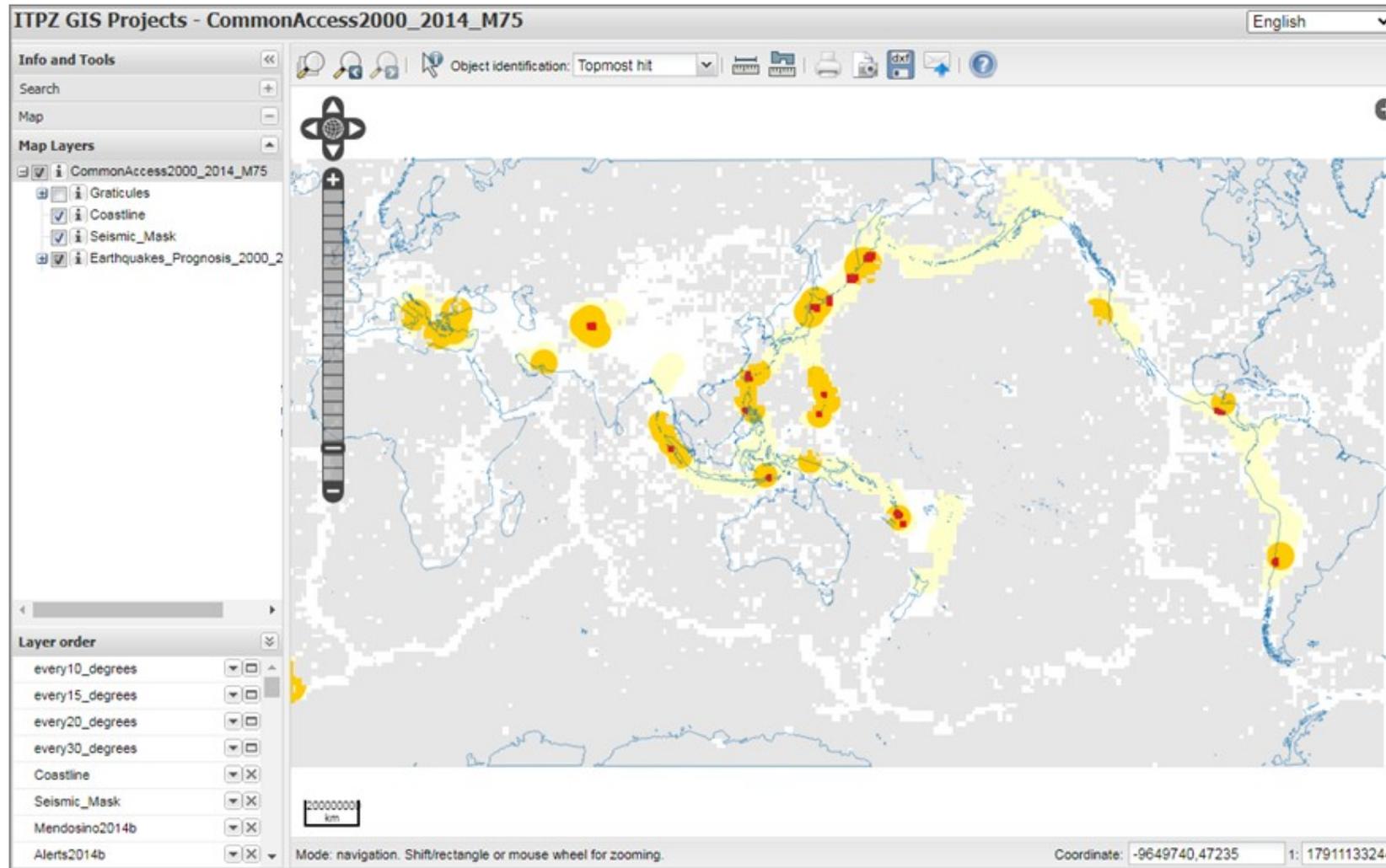


Earthquakes prognosis layers (open access)



Project 1: Global test for real-time prediction of the world's strongest earthquakes

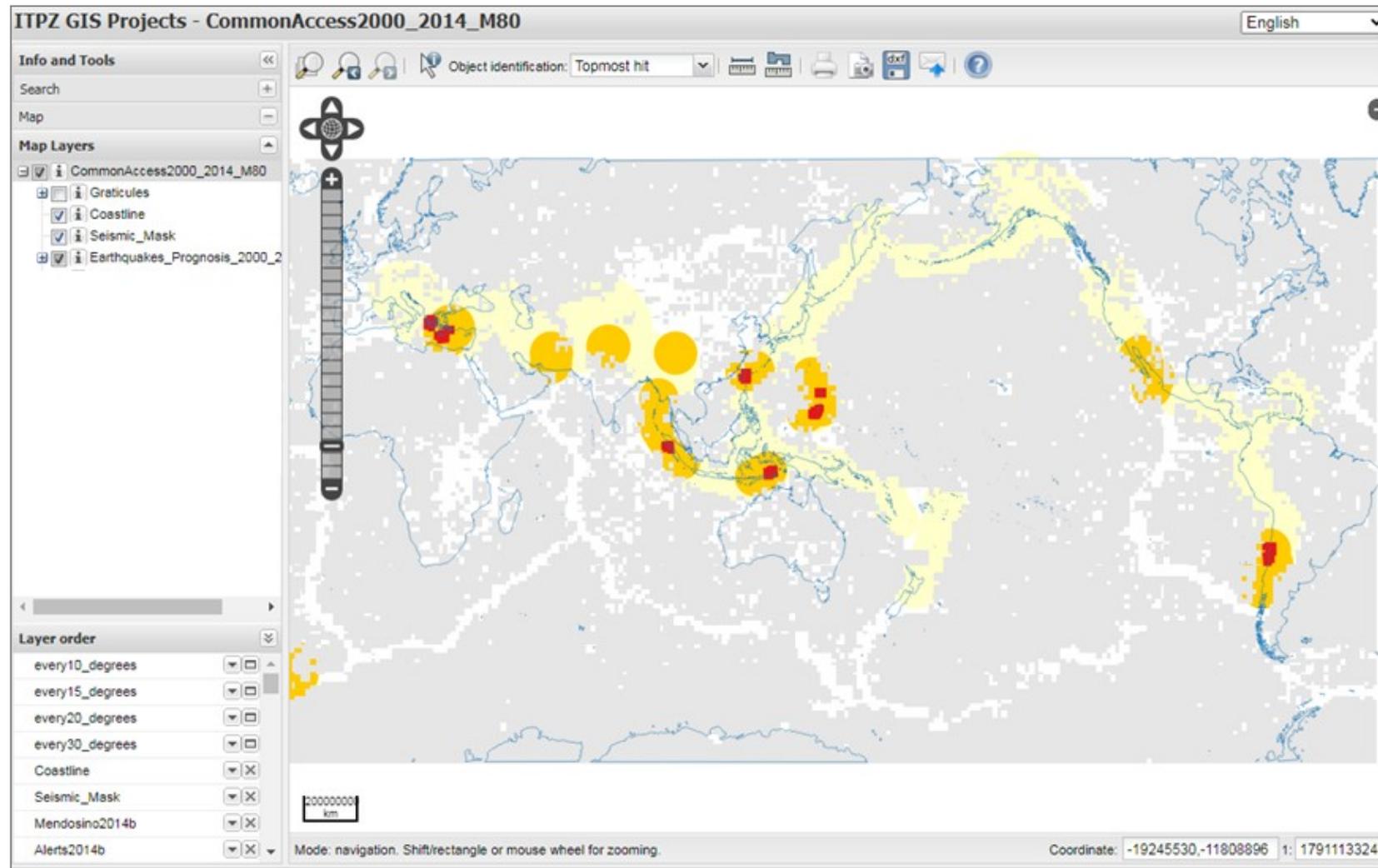
2000-2014
M 7.5



<https://www.itpz-ran.ru/en/results/maps-and-databases/global-test-for-real-time-prediction-of-the-worlds-strongest-earthquakes/earthquakes-data-m-8-0-7-5-2000-2014/>

Project 1: Global test for real-time prediction of the world's strongest earthquakes

2000-2014
M 8.0



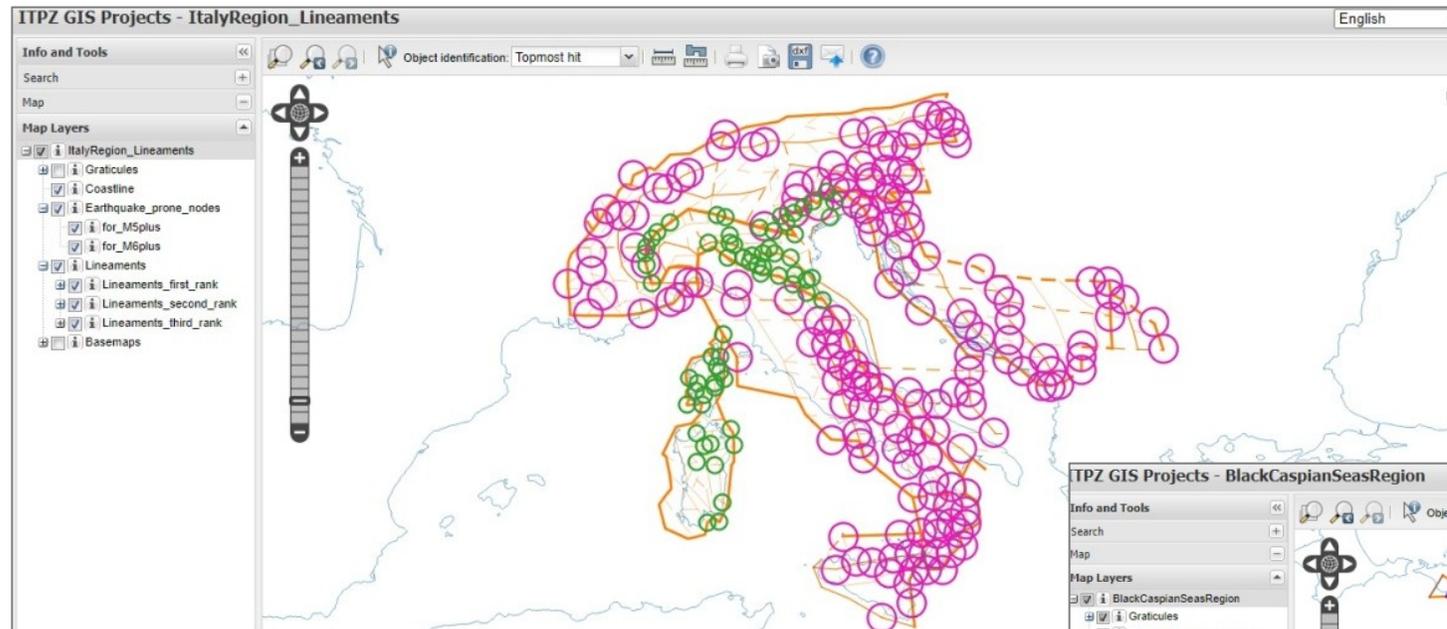
https://www.itpz-ran.ru/en/results/maps-and-databases/global-test-for-real-time-prediction-of-the-worlds-strongest-earthquakes/earthquakes-data-m-8_0-7_5-2000-2014/

- Lineaments project summarizes many years of research to recognize the places of possible strong earthquakes' s occurrence at the global scale
- These studies have shown that strong earthquakes are confined to the intersections of tectonically active fault zones - morphostructural nodes, their location is determined by the method of morphostructural zoning. Their classification is performed by pattern recognition algorithms depending on the degree of seismic hazard
- GIS-application is published on the basis of a desktop QGIS project containing general geographic layers and thematic data obtained at the Institute

Project 2:

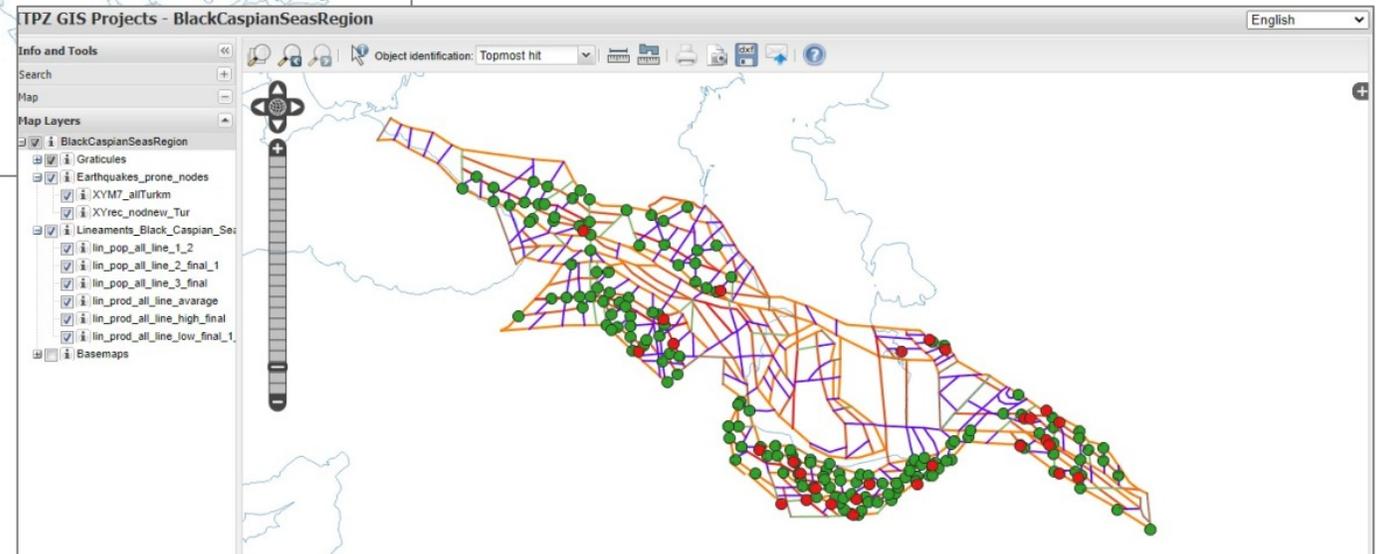
Morphostructural zonation and earthquake-prone areas

Italian region



Gorshkov A.I., Panza G.F., Soloviev A.A., Aoudia A., Peresan A. (2009). Delineation of the geometry of the nodes in the Alps-Dinarides hinge zone and recognition of seismogenic nodes ($M \geq 6.0$). *Terra Nova*, 21(4), 257-264. doi: 10.1111/j.1365-3121.2009.00879.x and references in it

Black and Caspian Seas



Novikova O. V. and A. I. Gorshkov (2018). High Seismicity Intersections of Morphostructural Lineaments: The Black-Sea-Caspian Region ISSN 0742-0463, *Journal of Volcanology and Seismology*, 2018, Vol. 12, No. 6, pp. 378–385. DOI: 10.1134/S0742046318060064 and references in it

Семинары

2021 2020 2019 2018 2017 Архив семинаров

2021

08.06.2021 **Прогноз землетрясения из класса сильнейшие ($M = 7.7$ и выше) в районе о-в Парамушир - юг Камчатки в конце августа — начале сентября 2021 г.**

А.В. Соломатин (ИВиС ДВО РАН)

Научно-образовательный семинар ИТПЗ РАН



03.06.2021 **Инструменты геоинформатики и геоданные в проектах ИТПЗ РАН (на примере Open Data и Open Source QGIS)**

Е.С. Подольская (ИТПЗ РАН)

Научно-образовательный семинар ИТПЗ РАН



22.10.2020 **Геопространственный анализ в QGIS DESKTOP**

Е.С. Подольская (ИТПЗ РАН)

Научно-образовательный семинар ИТПЗ РАН

На семинаре освещаются общие положения анализа данных в информатике и геоанализа в современных геоинформационных системах. Даются ссылки на источники данных, которые потенциально могут иметь географическую составляющую. Приводятся исторические факты появления геоанализа. В практической части рассматриваются инструменты стандартной функциональности и плагины для операций с векторными и растровыми данными в Open Source QGIS, которые могут быть использованы в самых разнообразных исследованиях по геоанализу.



27.05.2020 **Геоинформационные системы (с практическими примерами в Open Source QGIS), часть 3**

Е.С. Подольская (ИТПЗ РАН)

Научно-образовательный семинар ИТПЗ РАН

Оформление карт в QGIS Desktop

Публикация карт в QGIS Server, подготовка и оптимизация содержания проекта

17.03.2022 **Возможности использования ЦМР и ЦММ в проектах Института. Примеры в Open Source QGIS Desktop**

Е.С. Подольская (ИТПЗ РАН)

Научный семинар ИТПЗ РАН



https://www.itpz-ran.ru/ru/deyatelnost/seminars/#pll_switcher

- Web-gis implementation allows interacting with the users by providing them with the maps and data from the Institute's databases on several projects. Further expansion of web publishing is possible for other projects in 2D and 3D forms.
- External services thematically related to the earthquakes would be additional references, their performance and availability have to be tested.
- For the Institute web-gis publishing is not only the way to transform Desktop gis-projects, make them technically performante, but a way to share the information about projects and to find the ways of possible cooperation with the research community.
- Web-gis activities are combined with the educational seminars held at the Institute internally for colleagues of different backgrounds in a variety geoinformation domains such as Open Source and Open data directions, digital elevation models and surfaces for earthquakes, etc.
- The Institute actively invites students from different universities like Lomonosov State University, "MIREA – Russian Technological University", Gubkin National University of Oil and Gas, etc. to participate in the geospatial research with web-gis tools.

ACKNOWLEDGMENT

This study was carried out as part of the Russian State Task of IEPT RAS Scientific Research.

Thank you

Our contacts

<https://www.itpz-ran.ru/en/>



Ekaterina S. Podolskaia,
WoS Resercher ID: AAB-5255-2021;
ORCID: 0000-0002-0955-5489

[https://www.itpz-ran.ru/en/institute/researchers/ekaterina-s-podolskaia/
ekaterina.podolskaia@gmail.com](https://www.itpz-ran.ru/en/institute/researchers/ekaterina-s-podolskaia/ekaterina.podolskaia@gmail.com)



Anastasia K. Nekrasova,
WoS Resercher ID: D-4308-2017;
ORCID: 0000-0003-1639-1088



Tatiana V. Prokhorova,
WoS Resercher ID: D-3810-2017;
ORCID: 0000-0002-8829-2081



Aleksey V. Trubenkov



Olga V. Selyutskaya

- Advances in Web-based GIS, Mapping Services and Applications. Li, Dragicevic and Veenendaal (eds.) Taylor and Francis Group. 2011. London. UK. 385 p.
- Afanasiev A., Britkov V., Dribinskaya I., Permitin V. The Electronic Earth project – information-analytical environment for spatial scientific data. Russ. J. Earth Sci. 2010. 11. RE3004, doi:10.2205/2009ES000431.
- Braginskaya L. P., Grigoryuk A. P. The experience of thematic web resource. *Active seismology*. 2012. P. 1-5.
- Braginskaya L. P., Grigoryuk A. P., Kovalevskiy V. V., Zagorulko G. B. Development of the scientific environment for complex research in active seismology. Problems of complex geophysical monitoring of active seismic regions. Proceedings of All-Russian Scientific and Technical Conference with International participation. 26.09-2.10.2021. P. 378-381.
- Brudko K. Development of a web portal for presenting earthquake observation data. Proceedings of Conference ‘Geoinformatics 2021’. 11-14.05.2021. Kyiv. Ukraine. P. 1-5.
- Gorshkov A.I., Panza G.F., Soloviev A.A., Aoudia A. Morphostructural zonation and preliminary recognition of seismogenic nodes around the Adria margin in peninsular Italy and Sicily. *JSEE: Spring*. 2002. 4. N 1. P.1-24.
- Baranov S.V., Shebalin P.N. Patterns of post-seismic processes and forecast of strong aftershocks’s danger. Moscow. RAS. 2019. 218 p.
- Gorshkov A.I., Panza G.F., Soloviev A.A., Aoudia A. Recognition of the strong earthquake-prone areas ($M>6.0$) within the mountain belts of Central-Europe. *Revue Roumaine de Geophysique*. 2003. V. 47. P. 30-41.
- Gorshkov A.I., Panza G.F., Soloviev A.A., Aoudia A. Identification of seismogenic nodes in the Alps and Dinarides. *Bolletino della Societa Geologica Italiana*. 2004. 123. P. 3-18.
- Gorshkov A.I., Panza G.F., Soloviev A.A., Aoudia A., Peresan A. Delineation of the geometry of the nodes in the Alps-Dinarides hinge zone and recognition of seismogenic nodes ($M \geq 6.0$). *Terra Nova*. 2009. 21(4). P. 257-264. doi: 10.1111/j.1365-3121.2009.00879.x
- Healy J. H., Kossobokov V. G., Dewey J. W. A test to evaluate the earthquake prediction algorithm, M8. US Geol Surv Open-File Report. 1992. P. 92–401.
- Ismail-Zadeh A., Kossobokov V. Earthquake Prediction, M8 Algorithm. *Encyclopedia of Solid Earth Geophysics. Encyclopedia of Earth Sciences Series / Gupta H. (ed). Springer. Cham. 2021. P. 204-208. DOI:10.1007/978-3-030-10475-7_157-1*
- Fu P., Sun J. *Web GIS: principles and applications*. 2010. ESRI Press. 312 p.
- Keilis-Borok V. I., Kossobokov V. G. Premonitory activation of earthquake flow: algorithm M8. *Phys Earth Planet Inter*. 1990. 61. P. 73–83.
- Kossobokov V. User manual for M8. In: Healy J.H., Keilis-Borok V.I., Lee W. H. K. (eds.) *Algorithms for earthquake statistics and prediction*. IASPEI software library. V. 6. Seismological Society of America. El Cerrito. 1997. P. 1–167.
- Levina E. A. Operational assessment of the seismic hazard degree’s distribution by means of GIS. *Geoinformation –2016*. N. 1.P. 3-8.
- Locati M., Vallone R., Ghetta M. and Dawson N. QQuake, a QGIS Plugin for Loading Seismological Data From Web Services. *Front. Earth Sci*. 2021. 9:614663. doi: 10.3389/feart.2021.614663
- Mandrugin V. V., Archipenko O. P. Webgis as a result of geoinformation systems and Internet’s integration. *GeoSibir-2011, Novosibirsk, Siberian State Geodesy Academy*. 2011. Vol. 1. N. 2. P. 50-52.
- Maurya S. P., Ohri A., Mishra S. Open Source GIS: A Review. Proceedings of National Conference on Open Source GIS: Opportunities and Challenges Department of Civil Engineering, IIT (BHU). Varanasi October 9-10. 2015. P. 150-155.
- Novikova O. V., Gorshkov A. I. High seismicity intersections of morphostructural lineaments: the Black-Sea-Caspian region. *Journal of Volcanology and Seismology*. 2018. Vol. 12. N. 6. P. 378-385. DOI: 10.1134/S0742046318060064
- Podolskaia E. S. Open geodata and Open Source GIS in the Center for Forest Ecology and Productivity of the Russian Academy of Sciences (CEPF RAS). *Int. Arch. Photogramm. Remote Sens. Spatial Inf. Sci.* P. 123–125. <https://doi.org/10.5194/isprs-archives-XLVI-4-W2-2021-123-2021>, 2021.
- Podolskaia E. S., Nekrasova A.K., Prokhorova T. V. Trubenkov A. V., Selyutskaya O.V. Web-gis projects at the Institute of Earthquake Prediction Theory and Mathematical Geophysics, Russian Academy of Sciences (IEPT RAS). Modern methods of seismic danger’s estimation and earthquakes prognosis. Abstracts of II All-Russian Conference with International Participation. 29-20.09.2021. Москва: IEPT RAS. 2021. P. 87-88.
- Titov A. G., Okladnikov I. G. Architecture of gis web system for climate monitoring based on the spatial data services. *Bulletin of Novosibirsk State University. Series Information technologies*. 2014. Vol. 12. N. 1. P. 79–88.
- Zagorulko Yu. A. Technology to develop the intellectual Internet-resources for the experts. Infrastructure of scientific information resources and systems. Collection of selected scientific articles. Proceedings of the Fourth All-Russian Symposium (St. Petersburg, October 6-8, 2014). Edited by E.V. Kudashev, V.A. Serebryakov. Moscow. VC RAS. 2014. Vol. 1. P. 69-86.