United Nations
Educational, Scientific and
Cultural Organization

Annual Report* of IGCP Project No. 610 "From the Caspian to Mediterranean: Environmental Change and Human Response during the Quaternary"

Duration: 2013-2017

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Form V

1. Website address(es) related to the project

Project website was opened on the server of the Avalon Institute of Applied Science, Winnipeg, Canada, under the address: http://www.avalon-institute.org/IGCP610 upon receiving notification of our project's acceptance on 11 March 2013. We are using this website as the main platform to announce and share the information of project activities.

Additional websites were opened on servers of project co-leaders' organizations:
http://www.geogr.msu.ru/science/projects/unesco/
http://archaeology-ethnology.onu.edu.ua/?p=1096
http://www.geoecomar.ro/website/proiecte.html

2. Summary of major past achievements of the project: Enlarging IGCP 610 community to 250 researchers from 25 countries, 75% of whom are from developing countries surrounding the Caspian-Black Sea-Mediterranean Corridors (see 3.4). O**rganizing meetings, field trips, workshops and summer schools**: The First and Second Plenary Conferences and Field Trips in Georgia and Azerbaijan (October 2013 and 2014, respectively). Workshops in Sozopol (September 2013), Moscow (May 2014), Kirklareli (September 2014), Ahtopol (December 2014). Field School in Kalmykia (May 2014). Summer School in the Danube Delta on-board the floating laboratory boat "Halmyris" (summer 2013, 2014). The total number of young researchers from developing countries participating in all events is about 80. The practical outcome of the meetings was the developing of joint projects (Laermanns et al., 2014). **Presenting IGCP 610 activities** at international conferences: "Under the Sea: Archaeology and Palaeolandscapes" in Szczecin (September 2013); "Recent Problems on Lithology of Sedimentary Basins of Ukraine and Adjacent Territories» in Kiev (October 2014); "Geography and Geology at Higher School: the Modern State and Problems" in Odessa (October 2014). **Organizing working field trips** to study transgressive series of: Girkanian and Khvalynian age in Kalmykia and Lower Volga; Holocene in the coastal zone of Kerch Strait; Middle Pleistocene at Iznik Lake; as well as geoarchaeological evidence in Moldova, Crimea, Taman peninsula, Eastern Thrace, Bosporus coast and Aşağı Pınar. These field trips permitted collection of several hundred samples that were treated in different laboratories by various techniques. Without IGCP 610, no access and sampling of those geological sequences and artifacts would be possible. **Publication of Project results** in high ranking scientific journals (e.g., *Journal of Environmental Archaeology, Geomorphology, Quaternary Science Reviews, Marine Geology, Quaternary International, Palaeogeography, Palaeoclimatology, Palaeoecology*, etc. (see Annex 1) / Special Volume of the International Scientific Journal "Stratigraphy and Sedimentology of Oil-Gas Basins" / Publishing peer-reviewed Conference Proceedings (Tbilisi, 183 pages) and Baku (186 pages) and two Field Trip Guides. About 200 scientists from 22 countries contributed to the Conference Proceedings of 2013 and 2014 / Special issue of *Quaternary International* (to be published in 2015). **Linkage with other international projects and organization**s, such as EU-ITN programme "Drivers of Pontocaspian biodiversity rise and demise," EU-WAPCOAST BS-ERA.NET 076 "Water Pollution Prevention Options for Coastal Zones and Tourist Areas: Application to the Danube Delta Front Area," ICOMOS, and some cultural heritage projects focusing on developing awareness, capacity building, documentation of vernacular and urban heritage, as well as obtaining data on correlation of paleoenvironmental chnage and human adaptive strategies. **Disseminating** the project events and activities via regular updating of Project websites and mailing list of the project contributors, which increased from 957 in 2013 to 1054 in 2014, as well as social networks (Facebook for English and non-English-speakers, and Вконтакте for mostly Russian speakers) https://www.facebook.com/groups/180481035443572/, http://vk.com/album115218532_181815723.

3. Achievements of the project this year only

3.1. General scientific achievements (References in the text are in Annex 1): This Project provides cross-disciplinary and cross-regional correlation of geological, archaeological,

environmental, and anthropological records for reconstructing the geological history, paleoenvironmental change, and human response over a vast area from the Caspian to Mediterranean. Six dimensions of evidence (geological, paleoenvironmental, archaeological, paleoanthropological, mathematical, and geo-informational) have been continually explored by 12 Working Groups in 2014. The main achievements are: (1) **Collection of data-sets on:** recent ecosystems of the Romanian (Yanko-Hombach et al., in press) and Crimean (Sergeeva et al., 2014); stratotypes, key outcrops, and key boreholes in the Caspian (Kalmykia, Lower Volga, Western Cheleken, Northern Caspian) and Black Sea (NW, NE and SW shelf) and Gallipoli. Collected samples have been treated paleontologically and palynologically and dated by conventional and AMS methods by joint efforts of Ukrainian, Canadian, Russian, Dutch, American, UK, and Turkish scientists (Yanina et al., 2014; Büyükmeriç et al., 2014; Richards et al., 2014; Naidina, 2014; Leroy and López-Merino, 2014; Mudie et al., 2014; Yanko-Hombach et al., 2014 (see Annex 1); geophysical profiles for correlation of erosional and ravinement surfaces required for reconstruction and dating of ancient coastlines. Particular attention was paid to newly obtained seismoacoustic profiling and static sounding data on the sedimentary thickness of the Shirotnaya structure in the northern Caspian Sea (Yanina et al., 2014); contribution of active tectonics on sea-level change and coastal processes in the Marmara Region (Aytaç, 2014); geoarchaeological records from Moldova, Crimea, Taman Peninsula, Eastern Thrace (Özdoğan, 2014), and the NW Black Sea region (Smyntyna, 2014). (2) Revision of the taxonomy and ecology of recent and fossil mollusks, foraminifera, and ostracoda [=MFO] with use of SEM. (3) Development of a common geochronological frame necessary for correlating major events in human prehistory and history with global environmental changes. (4) Mathematical modeling of: the Caspian Sea level at the LGM, Holocene, the Last Millennia (Kislov et al, 2014); evolution of Black Sea coast and shelf during the Pleistocene (Esin and Esin, 2014a); and infilling of the Black Sea with Mediterranean saltwater in the early Holocene (Esin and Esin, 2014b). For the first time, local sea-level curves of the Mediterranean Sea were divided into eustatic and tectonic components, and it became clear that the dynamics of vertical crustal movements possess a complex, fractal nature. A system of equations describing the process of sea-level change in the Black and Marmara seas compared to the Aegean Sea was developed, in addition to a mathematical model of two-layer water flow in the Bosporus Strait based on the Navier-Stokes equations. The results obtained have provided an explanation for the shallowing and dividing of the Paratethys into the Black and Caspian seas (Esin et al., 2014).

3.2. List of IGCP project meetings/symposia and IGCP related meetings/symposia with exact attendance (if possible) and number of countries: IGCP 610 Second Plenary Meeting and Field Trip, Baku, Azerbaijan (12-20 October 2014); attended by about 100 participants from 11 countries. IGCP 610 Workshop, Moscow, Russia (20 May 2014) discussed scientific data obtained in the study of the Caspian region; attended by 50 scientists from Russia. Field School (Master class) "Complex study of Quaternary deposits of the Caspian region," Republic of Kalmykia (20-30 May 2014); attended by 20 young scientists.

3.3. Educational, training or capacity building activities related to the IGCP project and IGCP project participants: **Organizing:** the Field School (Master class) "Complex study of Quaternary deposits of the Caspian region" for students and young researchers in Kalmykia—organizers: T. Yanina, V. Yanko-Hombach, E. Badyukova; the Summer School in the Danube Delta on-board the floating laboratory boat “Halmyris”—organizer N. Panin. **Training** of Turkish and Bulgarian students in field methodologies during archaeological excavations in Kiten—organizer M. Özdoğan. **Involving** young researchers, MA and PhD students from Azerbaijan in the organization of the Second Plenary Meeting and Field Trip to increase their experience, organizational skills, and abilities to cultivate traditions of “European style” scientific fora as well as scientific discussion and informal meetings. **Promoting** a multidisciplinary approach in paleoenvironmental studies encouraging students in geology and geography to take archaeological courses and *vice versa*, thus stimulating teachers of the universities participating in IGCP 610 to modify their curricula. **Promoting** the preparation of several MA and PhD theses on subjects within

the IGCP 610 project (e.g., N. Kerimova, Azerbaijan; T. Kondaryuk, Ukraine; H. Laermanns, Germany). **Enhancing** the direct contacts between western and eastern youth, creating the background for better understanding of modern priorities in the developing world of science and humanities. Exposing the younger generation in developing countries to new analytical techniques and state-of-the-art data interpretation. **Teaching** the public about environmental evolution during the last climatic cycle and possible consequences of GCC anticipated to take full effect in this century. **Providing** consultation on stratigraphy, paleogeography, palynology, macro- and microfauna to interested parties from Russia, Azerbaijan, Ukraine, Iran, Bulgaria, the Netherlands, and Georgia.

*3.4. List of countries involved in the project (please *indicate the countries active this year and make the distinction between:* Azerbaijan*, Belgium, Bulgaria*, Canada*, Georgia*, Germany*, Greece, France*, Israel, Italy*, Kazakhstan*, Latvia*, Romania*, Russia*, The Netherlands*, Switzerland, Turkey*, UK*, Ukraine*, and USA*.

3.5. Participation of scientists from developing countries, and in particular young and women scientists: exact number and please describe how this project specifically benefited women scientists, young scientists and/or scientists from developing countries

	Total number of scientists	*Number of male scientists*	*Number of female scientists*
Number of participating scientists	*252*	*132*	*120*
Number of young scientists/students (<35 years old)	*48*	*29*	*19*
Number of scientists from developing countries	*190*	*110*	*80*

For benefit of women scientists, young scientists and/or scientists from developing countries see 3.3.

3.6. List of the 5 most important publications (including maps) of this year
a) could not have been published were if not for this project (see Annex 1).

A special issue of *Quaternary International* related to IGCP 610 is in progress, and we received 11 papers. A synthetic paper on the project will be submitted to *Episodes* in 2015.

b) related to this project (see Annex 2).

3.7.Activities involving other IGCP projects, UNESCO, IUGS or others: EU-ITN programme "Drivers of Pontocaspian biodiversity rise and demise." Project № 14-05-00227 "Environmental evolution of the Caspian and Black Sea under the multiscale changes of climate," supported by the Russian Foundation for Basic Research. EU-WAPCOAST BS-ERA.NET 076 “Water Pollution Prevention Options for Coastal Zones and Tourist Areas: Application to the Danube Delta Front Area.” Project № 12-05-01052 “Evolution of the relief of the Azov and Black Sea coast, climate, and sea level change: Comparative analysis and chronology of environmental processes for the last 20 ka,” supported by the Russian Foundation for Basic Research. Project № 13-05-00086 “Pont-Manych-Caspian oceanographic system in the late Pleistocene: Systematics and correlation of events, evaluation of character and degree of interaction, paleogeographic consequences in the region,” supported by the Russian Foundation for Basic Research. Project № 13-05-00242 “Radioisotope justification of age and synchronization of the Quaternary deposits of the Ponto-Caspian,” supported by the Russian Foundation for Basic Research. Project № 13-05-00625 “Peculiarities of the evolution of relief in the Northern Caspian region in the late Pleistocene: Main stages of the development, chronology, and correlation with climatic rhythms in the Black Sea-Caspian region,” supported by the Russian Foundation for Basic Research. Project “Paleogeographical evolution of the Gulf of Taman with special regard to the underwater excavations in Phanagoria” in cooperation with Russian Academy of Sciences (Archaeology) funded by the University of Cologne and Russian Foundation for Basic Research.

3.8. Scientific Legacy: There is a need for field data storage and other results of the project. We plan to upload a series of presentations and publications related to IGCP 610 at the main project website. The field data (e.g., field diaries, samples, maps, etc.), collections of MFO and cores are stored at the laboratories of Co-Leaders' institutions and are available for study by IGCP 610 participants.

3.9. What tangible improvements has your project obtained? (Besides publications, we are interested to hear about improvements to research, scientific contacts, policy implications, etc): IGCP 610 activity has encouraged East-West dialogue by integrating eastern and western scientists into an international R&D community through scientific collaboration, workshops, and annual meetings. As a result, eastern scientists have obtained access to western laboratories and advanced scientific methods while western scientists have had access to a vast amount of material stored in the former USSR and Eastern Bloc archives or published in local languages.

3.10. What kinds of activities in respect to the benefit of society and science outreach has your project undertaken? Implementing cultural heritage projects, open-air site museums, training centers for school children with possibility of conducting experimental research, working together with local Governmental and Non-Governmental Organizations across the Caspian-Black Sea-Mediterranean Corridors that we study as a single geographic unit, bypassing linguistic and political boundaries, and thus encouraging East-West dialogue, cooperation, and integration of researchers from different countries into the international R&D community; enhancing our understanding of the links between environmental change and human adaptation, contributing to an improvement in human living conditions (especially for those at risk from coastal flooding), and promoting the wise use of the Earth as a human habitat; and preserving human heritage by addressing and clarifying existing archaeological, ethnological, and paleoanthropological questions concerning the evolution of human subsistence strategies, social and ideological spheres in the light of environmental change, and human physical and cultural adaptation theory.

3.11. What kind of public information (media reports, etc) has your project generated? And how do you evaluate their impact?

There was an enormous interest in Project activity in Azerbaijan. Information about Projects and its activities was published in nine media sources (see below their URL).

http://www.azerbaijan-news.az/index.php?mod=3&id=51131;
http://www.itv.az/en/sport/beynaelkhalg-zheolozhiya-elmlaeri-program-n-n-610-sayl-layihaesi-ilae;
http://www.science.az/az/index.php?id=7696;
http://azertag.az/xeber/Bakida_Beynelxalq_Geologiya_Elmleri_Proqraminin_610_sayli_layihesinin_ikinci_plenar_iclasi_isine_baslayib-802193
http://sia.az/az/news/social/436584-araliq-denizinden-xezeredek-erazilerin-geoloji-tarixi-muzakire-edilir; http://teleqraf.com/news/26171; http://publika.az/site/p/46747
http://www.arxiv.az/az/azertag.az/21793000/Bakida+%E2%80%9CBeynelxalq+Geologiya+Elmleri+Proqraminin+610+sayli+layihesi%E2%80%9Dnin+ikinci+plenar+iclasi+ishine+bashlayib; http://topnews.az/news/755360/Bakida-Beynalxalq-Geologiya-Elmlari-Proqraminin-610-sayli-layihasinin-ikinci-plenar-iclasi-ishina-bashlayib.html

4. Activities planned

4.1.General goals: The general goal of IGCP 610 is exploration of the influence of environmental change on the development of humankind. In addition, the clear practical application of the project is that the coastal zone of the Caspian-Black Sea-Mediterranean Corridor is a highly developed industrial and agricultural region and a major source of food, raw materials, and links for transport and trade as well as recreation for many nations. Understanding the socially relevant issues of past environmental change is needed to estimate the future risks and impacts from similar events. Other plans include: In-depth study of the Lower Pleistocene (Old Caspian) geological sequences exposed in anticline structures of Cheleken, Nebit Dag, Monzhukly, Urundzhik, Khuda-

Dag, Kum-Dag in Turkmenistan. These deposits contain unique complexes of Caspian MFO, are known on the SE coast of the Caspian Sea only, and are highly debated. On-site study of these outcrops by IGCP 610 multidisciplinary team would bring us closer to a common understanding of the geological history of the Caspian Sea and would contribute to the current state of cooperation between UNESCO and Turkmenistan as promulgated during the official visit of Irina Bokova, UNESCO Director-General, to the Republic of Turkmenistan in May 2014 (http://www.unesco.org/new/en/unesco/about-us/who-we-are/director-general/singleview-dg/news/director_general_boosts_cooperation_with_turkmenistan-1/#.VHr7IMnzyid). Investigation of MFO and palynological fossils in core material from the Kerch Strait, Northern Caspian, northwestern and near Bosphorus Black Sea shelf as well as outcrops in Kalmykia and Lower Volga. We also plan to examine the role of climatic factors in the Black Sea sea-level changes expressed in transgressive and regressive events of decadal- and centennial-scale by using a theoretical approach developed and successfully utilized for the interpretation of secular Caspian Sea level records during the Holocene.

4.2.Tentative list of specific meetings and field trips (please list the participating countries): The Third Plenary Meeting and Field Trip, Ashkhabad, Republic of Turkmenistan (October 2015). The participating countries most certainly will include Azerbaijan, Bulgaria, Canada, France, Georgia, Germany, Greece, Iran, Italy, Kazakhstan, Turkmenistan, Romania, Russia, Turkey, Turkmenistan, U.K., Ukraine, and U.S.A. Special session "IGCP 610 Quaternary stratigraphy of the Ponto-Caspian region" at the 2nd International Congress on Stratigraphy - STRATI 2015, Graz, Austria (19–23 July 2015)—conveners: V. Yanko-Hombach and T. Yanina. Session #37125 – 2015 "From the Caspian to Mediterranean: Environmental Change and Human Response during the Quaternary (IGCP 610)" at the GSA Annual Meeting in Baltimore, Maryland, USA (1–4 November 2015)—conveners: V. Yanko-Hombach and T. Yanina. Special IGCP 610 Session and Round Table at the All-Russian Conference "Actual Problems of Paleogeography and Stratigraphy of the Pleistocene" with international participation, Moscow, Russia (8-11 June 2015)—convener: T. Yanina. Presenting IGCP 610 activities at the Third International Conference on Oceanography Philadelphia, USA (22-24 June 2015)—presenter V. Yanko-Hombach. Field trip to the Black Sea littoral areas of Bulgaria for visiting archaeological sites (Spring 2015)—organizer M. Özdoğan. Participation in the research cruise on R/V "Mare Nigrum" in the Black Sea—organizer N. Panin.

5. Attach any information you may consider relevant: Photogallery of Baku meeting https://www.facebook.com/groups/180481035443572/permalink/388744407950566/

Annex 1. List of five most important publications (including maps) of this year that not have been published were if not for this project:

Esin, N.V. and Esin, N.I. 2014. Mathematical modeling of Black Sea level change for the last 20000 years. *Quaternary International* 345: 32-47.

Özdoğan, M. 2014. The Quest for New Criteria in Defining the Emergence and the Dispersal of Neolithic Way of Life. In C. Mannen, T. Perrin, and J. Guilaine (eds.), *The Neolithic Transition in the Mediterranean*. Éditions Errance /Archives d'Écologie Préhistorique. Arles 2014: 74-89.

Yanina, T. 2014. The Ponto-Caspian region: Environmental consequences of climate change during the Late Pleistocene. *Quaternary International* 345: 88-95.

Yanko-Hombach, V., Mudie, P. J., Kadurin, S., Larchenkov, E. 2014. Holocene marine transgression in the Black Sea: New evidence from the northwestern Black Sea shelf. *Quaternary International* 345: 100-118.

Yanko-Hombach, V., Schnyukov, E., Pasynkov, A., Sorokin, V., Kuprin, P., Maslakov, N., Motnenko, I., Smyntyna, O. In Press. Late Pleistocene-Holocene Environmental Factors Defining the Azov-Black Sea Basin, and the Identification of Potential Sample Areas for Seabed Prehistoric Site Prospecting and Landscape Exploration on the Black Sea

Continental Shelf. In Flemming F., Harff J., Moura D. (eds.), Quaternary Palaeoenvironments of the European Continental Shelf: Environments for occupation and conditions for survival or destruction of submerged prehistoric deposits. Chichester, UK: Wiley-Blackwell.

Annex 2. List of the most important (in per-reviewed journals) publications (including maps) related to IGCP 610 published in 2014

Arpe K., Leroy S.A.G., Wetterhall F., Khan V., Hagemann S. and Lahijani H., 2014. Prediction of the Caspian Sea Level using ECMWF seasonal forecast and reanalysis. *Theoretical and Applied Climatology* 117: 41-60.

Bolikhovskaya, N., Porotov, A., Kaitamba, M. Razvitie priridnoy sredy I klimata na territorii Chernomorskoy delty Kubani v poslednie 7 tysyach let [Environmental and climatic evolution of the Black Sea delta of the Kuban river during the last 7000 years]. *Moscow University Herald* (Series 5. Geography) 1: 64–74.

Briceag, A. and Ion, G. 2014. Holocene ostracod and foraminiferal assemblages of the Romanian Black Sea shelf. *Quaternary International* 345: 119-129.

Drinia, H., Antonarakou, A., Anastasakis, G. 2014. Late Quaternary micropalaeontological record of a semi-enclosed marine basin, North Evoikos, central Aegean Sea. *Quaternary International* 345: 18-31.

Esin, N.I., Lyapin, A.A., Esin, N.V. Schlezinger, A.E. 2014. Metod rascheta evstaticheskogo khoda urovnya moray v golotsene po local'nym dannym [The method of calculating of eustatic sea level in Holocene on the local curves]. *Bulletin of Moscow Society of Naturalists. Geological Branch* 89(2): 52–60.

Kislov A., Panin A., Toropov P. 2014. Present-day variations and paleodynamics of the Caspian Sea level as a standard for climate modeling data verification. *Russian Meteorology and Hydrology* 39(5): 328–334. (In Russian)

Kislov, A., Panin, A., Toropov, P. Current status and palaeostages of the Caspian Sea as a potential evaluation tool for climate model simulations. *Quaternary International* 345: 48–55.

Leroy, S.A.G., López-Merino, L., Tudryn, A., Chalié, F., Gasse, F. 2014. Late Pleistocene and Holocene palaeoenvironments in and around the Middle Caspian Basin as reconstructed from a deep-sea core. *Quaternary Science Reviews* 101: 91-110.

Makhlough, A., Nasrollahzadeh, S. H., Eslami, F., Leroy, S.A.G. 2014. Features of the Phytoplankton Community in the Southern Caspian Sea, a decade after the invasion of Mnemiopsis leidyi. *Iranian Journal of Fisheries Sciences* 13(1): 145-167.

Mudie, P.J., Yanko-Hombach, V, and Kadurin, S. 2014. The Black Sea dating game and Holocene marine transgression. *Open Journal of Marine Science* 4: 1-7. http://dx.doi.org/10.4236/ojms.2014.41001.

Naderi Beni, A.M., Lahijani, H., Marriner, N., Pourkerman, M., Jokar, R., Hosseindoust, M., Djamali, M., Andrieu-Ponel, V., Kamkar, A. 2014. Caspian Sea-level changes at the end of Little Ice Age and its impacts on the avulsion of the Gorgan River: a multidisciplinary case study from the southeastern flank of the Caspian Sea. *Me'diterran'ee* 122: 133-143.

Özdoğan, M. 2014. The Quest for New Criteria in Defining the Emergence and the Dispersal of Neolithic Way of Life. In: C. Mannen, T. Perrin and J. Guilaine (eds.), The Neolithic Transition in the Mediterranean. Éditions Errance/Archives d'Écologie Préhistorique. Arles 2014: 74-89.

Pakzad, H. R., Pasandi, M., Soleimani, M., Kamali, M. 2014. Distribution and origin of heavy metals in the sand sediments in a sector of the Oman Sea (the Sistan and Baluchestan province, Iran). *Quaternary International* 345: 138-147.

Richards K., Bolikhovskaya N.S., Hoogendoorn R.M., Kroonenberg S.B., Leroy S.A.G. and Athersuch J., 2014. Reconstructions of deltaic environments from Holocene palynological records in the Volga delta, northern Caspian Sea. *The Holocene* 24(10): 1226-1252.

Sergeeva, N.G., Mazlumyan, S.A., Lichtschlag, A., and Holtappels, M. 2014. Benthic Protozoa and Metazoa living under anoxic and sulfide conditions in the Black Sea: Direct observations of actively moving Ciliophora and Nematoda. *International Journal of Marine Science* 4(42): 1-11. http://ijms.biopublisher.ca

Shnyukov, E.F., and Yanko, V.V. 2014. Gazootdacha dna Chernogo moray: geologo-poiskovoe, ekologicheskoe i navigatzionnoe znachenie [Degassing of the Black Sea bottom: significance for geological exploration, ecology and navigation]. Herald Odessa National University. Series of Geographical and Geological Sciences v. 19, Issue 3(23): 225-241. (In Russian)

Svitoch A., T. Yanina, E. Badyukova, B. Sheikhi. 2014. Biostratigraphy of the marine Holocene on the Iranian coasts of the Caspian Sea. *Quaternary International*. DOI: http://dx.doi.org/10.1016/j.quaint.2014.05.047 In press.

Taviania, M., Angelettia, L., Çağatay, M.N., Gasperinia, L., Poloniaa, A., Wesselingh, F.P. 2014. Sedimentary and faunal signatures of the post-glacial marine drowning of the Pontocaspian Gemlik "lake" (Sea of Marmara). *Quaternary International* 345: 11-17.

Triantaphyllou, M.V. 2014. Coccolithophore assemblages during the Holocene Climatic Optimum in the NE Mediterranean (Aegean and northern Levantine Seas, Greece): Paleoceanographic and paleoclimatic implications. *Quaternary International* 345: 56-67.

Tudryn, A., Giannesini, P.-J., Guichard, F., Badaut-Trauth, D., Tucholka, P., Boomer, I. 2014. The role of iron minerals in laminae formation in Late Pleistocene sediments of the Caspian Sea. *Quaternary International* 345: 68–76.

Tyuleneva, N., Suchkov, I., Fedoronchuk, N. 2014. Changes in coastline positions during the Holocene in the shelf of the Northwestern Black Sea. *Quaternary International* 345: 77-87.

Yanina T.A., Sorokin V.M., Bezrodnykh Yu.P., Romanyuk B.F. 2014. Girkanskiy etap v pleistotsenovoy istorii Kaspiyskogo morya [Girkanian epoch in the Pleistocene history of the Caspian Sea]. Moscow University Herald (Series 5. Geography) 3:3-9. (In Russian)

Yanina, T. 2014. The Ponto-Caspian region: Environmental consequences of climate change during the Late Pleistocene. *Quaternary International* 345: 88-99.

Yanko V., Mudie P. J., Kadurin S., Larchenkov E. 2014. Holocene marine transgression in the Black Sea: New evidence from the northwestern Black Sea shelf. *Quaternary International* 345: 100-118.

Yanko, V.V., Kondaryuk, T.O., Likhodedova, O.G., Motnenko, I. 2014. Otsenka vliyaniya rechnogo stoka na morskie donnye ecosistemy po bentosnym foraminiferam i litologii donnykh otlozheniy [Evaluating the influence of river discharge on marine bottom ecosystems using benthic foraminifera and lithology from bottom sediments]. *Geology and Mineral Resources of the World Ocean* 4. In press. (In Russian)

Yanko-Hombach, V., Schnyukov, E., Pasynkov, A., Sorokin, V., Kuprin, P., Maslakov, N., Motnenko, I., Smyntyna, O. In Press. Late Pleistocene-Holocene Environmental Factors Defining the Azov-Black Sea Basin, and the Identification of Potential Sample Areas for Seabed Prehistoric Site Prospecting and Landscape Exploration on the Black Sea Continental Shelf. In Flemming F., Harff J., Moura D. (eds.), Quaternary Palaeoenvironments of the European Continental Shelf: Environments for occupation and conditions for survival or destruction of submerged prehistoric deposits. Chichester, UK: Wiley-Blackwell.

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Book Chapters

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