



IGCP 610
Third Plenary Conference and Field Trip
From the Caspian to Mediterranean:
Environmental Change and Human Response
during the Quaternary

Astrakhan, Russia
22-30 September 2015

PROCEEDINGS

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УДК 551.461(262)(036)

IGCP 610 Third Plenary Conference and Field Trip “From the Caspian to Mediterranean: Environmental Change and Human Response during the Quaternary” 22-30 September 2015, Astrakhan, Russia. Proceedings / Ed.: A.Gilbert, V.Yanko-Hombach, T.Yanina. Moscow, MSU, 2015, 220 p.

ISBN

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AIMS AND SCOPE

The main goal of the IGCP 610 Project is to provide cross-disciplinary and cross-regional correlation of geological, archaeological, environmental, and anthropological records in order to (a) explore interrelationships between environmental change and human adaptation during the Quaternary, (b) create a networking and capacity-building structure to develop new interdisciplinary research initiatives, and (c) provide guidance to heritage professionals, policy makers, and the wider public on the relevance of studying the Caspian-Black Sea-Mediterranean Corridor ["CORRIDOR"] for a deeper understanding of Eurasian history, environmental changes and their relevance, and likely future impacts on humans.

The "CORRIDOR" is perfectly suited for these purposes. (1) It encompasses the large chain of intercontinental basins—the Caspian, Black (together called Ponto-Caspian), Marmara, Aegean, and Eastern Mediterranean (Levantine) seas—with their connecting straits and coasts. Here, sea-level changes are clearly expressed due to geographical location and semi-isolation from the World Ocean, which makes the "CORRIDOR" a paleoenvironmental amplifier and a sensitive recorder of climatic events. Periodic connection/isolation of the basins during the Quaternary predetermined their specific environmental conditions and particular hydrologic regimes, and thus, the area, and especially the Black Sea, represents a "natural laboratory" to study the responses of semi-isolated basins to GCC. (2) It has rich sedimentary and geomorphologic archives that document past environmental changes. (3) It has a substantial archaeological, anthropological, and historical record. In particular, it contains evidence for the transition from *Homo erectus* to *Homo sapiens*. The first appearance of a *Homo* species in the "CORRIDOR" is dated to the Lower Paleolithic, ca. 1.8 million years ago, at Dmanisi in Georgia. After this species migrated into the Ponto-Caspian area, human colonization of the region continued, major cultural and technological inventions (tools, hearths, dwellings, clothes, decorations, etc., as well as the origin of art, ideology, and ritual practice) ensued, and subsistence strategies were elaborated, enabling us to investigate multiple physical, social, and cultural responses of humans to global environmental change. (4) It is easily accessible for study.

To achieve the main goal and objectives, the Project will incorporate six dimensions, each addressed by integrating existing data and testing of hypotheses: 1. The geological dimension will examine the sedimentary record of vertical sea-level fluctuations and lateral coastline change. 2. The paleoenvironmental dimension will integrate paleontological, palynological, and sedimentological records to reconstruct paleolandscapes. 3. The archaeological dimension will investigate cultural remains. 4. The paleoanthropological dimension will study responses of different *Homo* species to environmental change. 5. The mathematical dimension will provide GIS-aided mathematical modeling of climate and sea-level changes, and human dispersal linked to paleoenvironmental variation that can be meaningfully compared with current global changes. 6. The geo-information dimension will grasp the "big picture" of geoarchaeological events over the duration of the Quaternary. Particular attention will be given to synthesizing the wealth of literature published in local languages, stored in archives, and largely unknown or ignored in the West. Study sites will include the Caspian, Azov-Black Sea, Marmara, and Eastern Mediterranean. These sites are characterized by rich sedimentary, geomorphological, archaeological, paleoanthropological, and historical records providing a superb opportunity to assess the influence of climate and sea-level change on human development. It is expected that the project will allow us to suggest a groundbreaking, comprehensive theory about the influence of paleoenvironmental changes on human adaptive strategies during most of the Quaternary in the region of the Southern Eurasian seas.

The Field Trips will follow the Plenary Meetings (Fig. 1). They will be focused on observation of geological characteristics of Quaternary stratotypes as well as key archaeological and paleontological sites. All of them are easily accessible for study and will be sampled during the Field Trips for further investigation in various laboratories around the world.

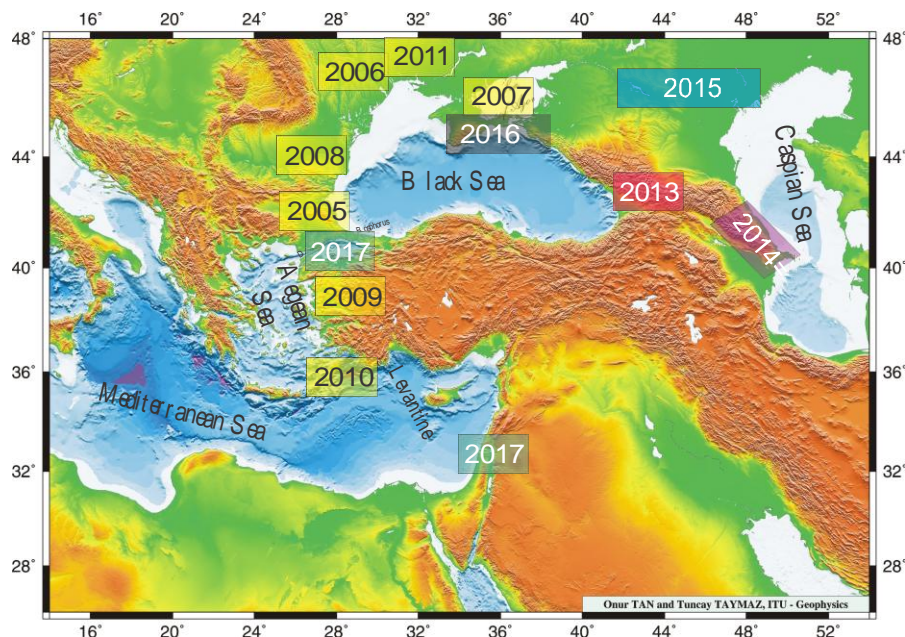


Figure 1. The Caspian-Black Sea-Mediterranean “CORRIDOR”: in yellow are the locations of IGCP 521-INQUA 501 meeting and field trip sites (2005-2011); in other colors are sites to be studied by the present IGCP 601 Project: 2013 – Tbilisi, Georgia; 2014 – Baku, Azerbaijan; 2015 – Astrakhan (Lower Volga), Russia; 2016 – Sevastopol (Crimea) and the Taman Peninsula, Russia; 2017 – Haifa, Israel, and Istanbul, Turkey

The Third Plenary Meeting and Field Trip will be held in the Northern Caspian region in the city of Astrakhan and the Astrakhan region. The city of Astrakhan, the oldest economic and cultural center of the Lower Volga and the Caspian Lowland, is located in the upper part of the Volga Delta on 11 islands. The area of the city is 208.7 km². The population of the city is about 531,000 people. The city is multicultural and inhabited by representatives of more than 100 nationalities and 14 religious denominations. The Astrakhan region extends along both sides of the Volga-Akhtuba floodplain for 400 km, and it is bordered on the east by Kazakhstan, on the north and northwest by the Volgograd region, on the west by the Republic of Kalmykia, and on the south, it is bounded by the Caspian Sea. Thanks to its unique geographical location, the Astrakhan region is a land of considerable natural contrasts.

Within the wide Volga-Akhtuba floodplain, which crosses a desert plain from northwest to southeast, desert landscapes alternate with meadows, riparian forests, and dense reed-beds. The Volga Delta is the largest river delta in Europe. It includes 500 sleeves (hoses), ducts, and small waterways, creating an abundance of rivers, lakes, islands and islets, winding water channels and bays, sand dunes, and the peculiar ridges known as Baer knolls, forming a diversity of rich of natural landscapes. Here are found the largest fields of lotus blossoms in the world, in which some can cover up to 7 × 10 km. The climate is moderate, sharply continental, with large annual and summer daily ranges in air temperature, low precipitation, and high evaporation rates. The typical winds are easterly, southeasterly and north-easterly, and summers often experience droughts.

Field trips will focus on the spectrum of Quaternary geological sequences exposed within sections of the Lower Volga area. This includes major exposures in the Volga valley between Astrakhan and Volgograd: Cherniy Yar – Nizhnee Zaimische, Kopanovka, Lenino, and Seroglazka. The conference participants will be able to see deposits of the Baku, Early Khazarian, Late Khazarian, Khvalynian, and Novocaspian transgressions, and the continental sediments separating them: Singilsky, Chernoiarsky, and Atel. They will be able to select samples for faunal, palynological, and other tests. They will also see the Baer knolls (named for Karl Baer, who described them for the first time in the 19th century), which are east-west elongated ridges in the Caspian Lowland, a unique natural formation that has no analogues in the world.

It is planned to visit the lotus fields in the Volga Delta, which are the largest flowering sites on the

planet. Lotus flowers blossom beginning in mid-summer and lasting until mid-September. In these places, one can observe birds coming from Africa, Iran, and India: flocks of swans, geese, ducks, pelicans, herons, and cormorants form colonies comprising thousands of individuals. Exotic rare species also congregate: pink flamingos, osprey, spoonbill, Dalmatian and great white pelicans. The population density of white-tailed eagle in the Astrakhan region is the highest in the world.

Archaeological tours will be held at the main ancient sites of the region. The first is the archaeological complex "Selitrennoe gorodishche" (Saltpetrer Settlement), which is located 130 km north of Astrakhan. In the XIII to XIV centuries, it was the capital of the richest nomadic state in the Middle Ages, Sarai-Batu, seat of the Golden Horde founded by Genghis Khan's grandson, Batu Khan. A natural outcrop of the Caspian Pleistocene sediments is situated on the Akhtuba coastal cliff near the archaeological complex, so it will be also available for a visit. Another archaeological site of the region—Gorodishche Samosdelka (the Ancient Itil Settlement)—is located 45 km below Astrakhan on the right bank of the Old Volga river. The main part of the settlement is situated on an island, surrounded by dried up canals. Cultural layers of this medieval city, with a total depth of about 3–3.5 m, contain the artifacts of the Khazar Khaganate Culture, the golden age of the city Saksin (XI to XIII centuries) which predated Sarai Batu. There also is located the famous Museum of Russian Watermelon. September is the best time for this delicious fruit. Plans have been made to visit other archaeological and historical places in Astrakhan: the Astrakhan Kremlin, that was built between 580 and 1620, and the Regional Natural History Museum, which covers the history of the natural environment of the region and displays many of the paleontological finds from the Pleistocene deposits of the Volga valley, together with historical and archaeological objects.

The meeting will cover eight days. Five days (23-26 September and 30 September) will be dedicated to the field trips, and three days (27-29 September) spent in plenary sessions and excursions to the Astrakhan Kremlin and Regional Natural History Museum

WELCOME

On behalf of the Organizing and Executive Committees as well as the Moscow State University, Institute of Geography RAS, Astrakhan State Museum-Reserve, Russia, and Avalon Institute of Applied Science, Canada, we are delighted to welcome you to the IGCP 610 Third Plenary Conference and Field Trip being held on 22-30 September 2015 in Astrakhan, Russia.

This conference is the third in a series of IGCP 610 Plenary Conferences and Field Trips. It is expected that IGCP 610 conferences bring together multidisciplinary scientists from all over the world and in the process enhance West-East scientific dialogue by providing a supportive background for collaboration regarding the correlation and integration of discoveries on the influence of climatically/tectonically induced sea-level changes and coastline migration on humanity. This is an area of strategic importance not only for all coastal countries but also for at least 17 other countries sharing a drainage basin that is one-third the size of the European continent.

The Third Plenary Conference and Field Trip has been organized and sponsored by the Faculty of Geography of the Moscow State University, Institute of Geography RAS, and Avalon Institute of Applied Science, Canada with organizational contribution of Astrakhan State Museum-Reserve, with moderate financial contributions from IGCP.

We are happy to welcome to Russia distinguished specialists and students in the Humanities, Earth, and Life Sciences from Azerbaijan, Bulgaria, Canada, Georgia, Iran, Italy, Latvia, Netherlands, Romania, Russia, Turkey, Turkmenistan, Ukraine, and USA.

We wish you a very pleasant stay in Russia.

Sincerely,

Organizing and Executive Committees of IGCP 610 Third Plenary Meeting and Field Trip

VENUE

The conference will be held in Astrakhan, Russia. The city of Astrakhan, the oldest economic and cultural center of the Lower Volga area and the Caspian Lowland, is located in the upper part of the Volga Delta on 11 islands. The area of the city is 208.7 km². The population of the city is about 531,000 people. The city unites the European and Asian Cultures, it is on multicultural and inhabited by representatives of more than 100 nationalities and 14 religious denominations

The Astrakhan was founded in the middle of the XIII th century. It's varied history is reflected in its architecture, which is a mix of various styles and cultures. The main sight of the city is the Astrakhan Kremlin. The Astrakhan Kremlin was founded in 1558 on the lower Volga, on a high hill, surrounded by swamps and marshes. First, it was a wooden fortress with strong earthen walls, pales and towers. The location and configuration of the Astrakhan Kremlin was dictated by the landscape, so it has the shape of a right triangle, with the top elongated to the southwest. The wooden fortress was rebuilt in stone in the period of Ivan IV the Terrible and Boris Godunov (1582–1589). This building stage of the Astrakhan Kremlin was one of the first stone fortifications in Russia. It was among the most powerful defense facilities of the Moscow-centered State. For centuries, it was an impregnable stronghold in the southeastern border area of Russia. There are some notable events connected with the Kremlin: the Crimean Turkish intervention in the Lower Volga in the XVI century, the Time of Troubles in Russia and Stepan Razin uprising in the XVII century, Peter I reforms and the rebellion of musketeers 1705–1706, the Persian campaign of Peter I and founding of the Caspian Fleet in the XVIII century, the strengthening of the country's borders and annexation of the Caucasus and Central Asia to the Russian Empire.

The scientific sessions will be held in the conference hall of the “Azimut” Hotel. Most of the conferees will be lodged here as well. “Azimut” Hotel is located in the central part of Astrakhan city on Volga River Embankment near the river mooring. Address: Kremlevskaya (Kremlin) Street, 4. Telephone: +7 (8512) 69-08-37; +7 (8512) 69-07-92

ACKNOWLEDGEMENTS

We gratefully acknowledge the support and hospitality of M.V. Lomonosov Moscow State University, Institute of Geography RAS, Astrakhan State Museum-Reserve for hosting the IGCP 610 Third Plenary Conference and Field Trip, and providing us with their facilities to convene this conference. Support has also been received from the Avalon Institute of Applied Science, Canada. Financial contributions to partly underwrite the costs for young scientists from developing countries and countries in transition were kindly provided by IGCP.

We are indebted also to Prof. Dr. Tamara YANINA (Moscow State University), President of the Conference, Redzhep KURBANOV (Institute of Geography RAS), Vice-President, Radik MAKSHAEV (Moscow State University), Executive secretary for their extraordinary efforts in organizing the conference and field trips. We gratefully acknowledge the assistance of members of Organizing, Executive and Scientific Committees of the Conference. Particular appreciation is extended to Aleksey BULYCHEV, Director of Astrakhan State Museum-Reserve, Mikhail GOLOVACHEV, Evgeniy PIGAREV and Dmitriy VASILIEV (Astrakhan State University and Museum-Reserve) for arranging the Field Trips. We acknowledge the assistance of staff of Museum-Reserve (Svetlana KUNYASHOVA, Andrey KURAPOV, Radmila TARKOVA) for arranging the excursions.

We gratefully recognize the assistance of Prof. Allan GILBERT together with Prof. Dr. Valentina YANKO-HOMBACH for editing of the Conference Proceedings. For her prompt action, we extend our appreciation to the Administrator of the Project, Dr. Irena MOTNENKO.

We are also very grateful to the journal *Quaternary International*, which has kindly invited us to publish the Russia conference proceedings within their pages.

Valentina Yanko-Hombach

IGCP 610 PROGRESS REPORT (2014)

Yanko-Hombach, V.

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Avalon Institute of Applied Science, 976 Elgin Avenue, Winnipeg MB R3E 1B4, Canada
valyan@avalon-institute.org

1. Website address(es) related to the project

<http://www.avalon-institute.org/IGCP610/index.php> - main

<http://www.geogr.msu.ru/science/projects/unesco/>

<http://www.geoecomar.ro/website/proiecte.html>

<http://archaeology-ethnology.onu.edu.ua/?p=1096>

<https://www.facebook.com/groups/180481035443572/>

http://vk.com/album115218532_181815723

2. List of countries and number of participants involved in the project

Azerbaijan, Belgium, Bulgaria, Canada, Denmark, Georgia, Germany, Israel, Iran, Italy, France, Latvia, Romania, Russia, The Netherlands, Slovakia, Switzerland, Turkey, Turkmenistan, UK, Ukraine, and USA. The IGCP 610 community includes about 250 researchers from 25 countries, 75% of whom are from developing countries surrounding the CORRIDORS. About 80 participants fall into the category of young scientists (below 35 years old); about 50% of them are female; about 30% of the total number are students.

3. Summary of IGCP 610 activities

The project commenced on 1 April 2013. Since that time, it has served as a focal point for correlation of scientific data obtained by research projects dealing with environmental change and human response in a variety of settings within the Caspian-Black Sea-Mediterranean Corridors [CORRIDORS] during the Quaternary. In general, two years of IGCP 610 activity have been carried out in a strict agreement with the Working Plan [http://www.avalon-institute.org/IGCP610/work_plan.php]. The one exception was the creation of the GIS-aided Interactive Data Base that was postponed until the end of the project.

Technical activities:

1) Meetings, field trips, workshops, and summer schools:

- The First and Second Plenary Conferences and Field Trips in Georgia and Azerbaijan in October 2013 and September 2014, respectively
- Workshops in Sozopol (September 2013), Moscow (May 2014), Kirklareli (September 2014), and 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)

2) Presenting IGCP 610 results 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)

3) Fieldwork studies of:

- transgressive series of Girkanian and Khvalynian age in Kalmykia and Lower Volga
- Holocene deposits in the coastal zone of Kerch Strait

- Middle Pleistocene sediments at Iznik Lake
- geoarchaeological evidence in Moldova, Crimea, Taman peninsula, Eastern Thrace, Bosphorus coast and Aşağı Pınar, and the Danube delta

These fieldwork projects 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 have been possible.

4) Publications of Project results:

- in various high ranking scientific journals
- special volume of the international scientific journal *Stratigraphy and Sedimentology of Oil-Gas Basins*
- special issue of *Quaternary International* (to be published in 2015)
- peer-reviewed Conference Proceedings (Tbilisi, 183 pages) and Baku (186 pages) and Field Trip Guides. About 200 scientists from 22 countries contributed to the Conference Proceedings of 2013 and 2014.

5) Linkage with other international projects and organizations:

- 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 The International Council on Monuments and Sites
- COCONET "Towards COast to COast NETworks of marine protected areas (from the shore to the high and deep sea), coupled with sea-based wind energy potential," supported by EU
- ECOST-MEETING-TD0902-090310-001280 SPLASHCOS "Submerged Prehistoric Archaeology and Landscapes of the Continental Shelf"
- State Budget Project #539 "Study of the formation processes and spatial distribution of methane in the Black Sea and theoretical considerations of their influence on basin eco- and geosystems," supported by the Ministry of Education and Science of Ukraine
- Project № 11-05-00093 "Caspian region: Peculiarities of development of the environment under climate and sea level change," supported by the Russian Foundation for Fundamental Research
- 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 Fundamental 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 Fundamental Research
- Project № 13-05-00242 "Radioisotope stratification of age and synchronization of the Quaternary deposits of the Ponto-Caspian," supported by the Russian Foundation for Fundamental 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 Fundamental Research
- Project № 12-05-31281 "Khvalynian epoch in the history of the Caspian region: Paleoclimates and environmental evolution," supported by the Russian Foundation for Fundamental Research

6) 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 1039 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

Scientific activities:

1. Establishing the Reference List of main publications on Project subjects; a majority of which are published in Russian and their titles required transliteration and translation into English
2. Collecting the data set on chronometric data
3. Correlating the Regional Stratigraphic Scales
4. Establishing the reference collection on the Ponto-Caspian foraminifera (supplemented by SEM images) and mollusks.
5. Collecting a series of regional paleogeographic and geological maps.
6. Continuing the development of a common geochronological frame necessary for correlating major events in human prehistory and history with global environmental changes
7. Collaborative Danube Delta studies of samples from delta front to the outer shelf enabling the quantification of differences among palynology processing methods and revealing a new paradigm for palynomorph distribution models in microtidal semi-enclosed basins
8. Collaborative Danube Delta studies from delta front to the outer shelf on soft and hard-shelled meiobenthos (nematodes, polychaetes, foraminifera, ostracoda, etc.) and mollusks
9. Developing a model for the filling of the Black Sea basin by Mediterranean salt water during the Holocene
10. Developing a model for the processes of Caspian-Mediterranean corridor formation and the Paratethys Sea-Lake degradation
11. Observations of geological characteristics of Quaternary stratotypes as well as key archaeological and paleontological sites in Georgia, Azerbaijan, and Russia with further investigations of samples in various laboratories around the world
12. The study of archaeological sites included Gobustan with its famous petroglyphs of the Mesolithic age. Plans included visits to some archaeological and historical places in Baku: the Shirvanshakh Palace constructed during the period from the XIIIth to the XVIth century; the Maiden Tower (the most mysterious monument of Baku) of which the unique construction has no analogues in the East
13. Detailed study of chocolate clays in the Middle and Lower Volga region that have enabled the discovery of a direct correlation between their occurrence and morphology of relief. Material collected by the expedition is currently being studied using palynologic, lithologic, geochronologic, malacofaunal, and micropaleontologic methods
14. Developing of a Holocene stratigraphic scale for the Iranian coast of the Caspian Sea
15. Obtaining new material for paleogeographic reconstructions of the Caspian basin from biostratigraphic analysis of five boreholes recovered in the North Caspian. Two marine strata that are absent on the coasts were discovered. Also, obtained a series of new radiocarbon dates for sediments and events of the late Pleistocene in the Caspian.

3. Social benefits

Implementing cultural heritage projects, open-air site museums, training centers for school children with the 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.

4. IGCP 610 fieldwork and meetings in 2014

1) The Field School (Master class) "Complex Study of Quaternary Deposits of the Caspian Region" was carried out by IGCP 610 Working Group 8 "Paleogeography and Paleoenvironment." The main goal of the Field School was to train young researchers from developing countries in advanced methodology and state-of-the-art interpretation of field data exemplified by the classic geological sequences of the Caspian region. Organizers: Prof. T. Yanina, Prof. V. Yanko, Dr. E. Badyukova. Number of young researchers and students: 20. Teachers of the Master class: Prof. A. Svitoch (description of the sections, lithological and facies methods, complex paleogeographical interpretation of sections); Prof. T. Yanina (macrofaunistic and microfaunistic methods, popular lectures); Dr. Badyukova (geomorphological method); Prof. N. Bolikhovskaya (palynological methods, analyses of loess and soil formation); Prof. V. Bolshakov (magnetic and paleomagnetic analyses, geochronological methods). Initially the Field School was planned for the end of August 2014, but it was urgently pushed forward to an earlier period (May) due to climatic forecasts that predicted an excessively hot summer. To work in such weather conditions in Kalmykia would represent a risk to the health of participants. Achievements: Training the young researchers from developing countries in advanced methodology and state-of-the-art interpretation of field data exemplified by the classic geological sequences of the Caspian region. Popularizing the history of the Caspian Sea conducted for students of the college and other young people from Kalmykia in the village Malye Derbety. Outcome: Information on the event and expressions of gratitude to the director of the College, Dr. N. Dundukov for assistance was published in the newspaper of Kalmykia. Twenty young researchers from developing countries obtained extensive training in advanced methodology and state-of-the-art interpretation of field data exemplified by the classic geological sequences of the Caspian region. The history of the Caspian Sea was popularized among students, young researchers, and the wider public of the Kalmykia.

2) The Second Plenary Meeting and Field Trip was organized by the Institute of Geology and Geophysics of the Azerbaijan National Academy of Sciences (www.gia.az) and the Avalon Institute of Applied Science, Winnipeg, Canada, and hosted by the Institute of Geology and Geophysics. About 90 people from 11 countries participated in the meeting. The meeting was focused on the whole spectrum of Quaternary geological sequences exposed in the terraces and ridges of the Caspian region. This includes the stratotype of the Mountain of Bakinian stage (ca. 600–450 k BP) located in the suburbs of Baku on the Absheronian Peninsula; major exposures in the southwestern part of the peninsula of Garagush mountain, Bakinskies Ushi. This includes outcrops of Quaternary deposits at Garamaryam and Turianchay in the Ajinour region, and Bozdag located in the Middle Kura region, which is a reference section of the marine sediments of the Bakinian stage in western Azerbaijan. The Neogene-Quaternary boundary as well as the Matuyama-Brunhes Reversal with Olduvai and Jaramillo episodes were traced. The archaeological sites in Gobustan with its famous petroglyphs of Mesolithic age were observed. Plans included visits to some archaeological and historical places in Baku: the Shirvanshakh Palace constructed during the period from the XIIIth to the XVIth century; the Maiden Tower (the most mysterious monument of Baku) of which the unique construction has no analogs in the East. The Palace complex and Maiden Tower are included in the UNESCO list of World heritage sites. The participants also visited the historical-cultural reserve of Lagich that dates from the XV-XIX centuries, the first Christian Church in the Caucasus dated to the Ist century, excavations of an ancient town located in the suburbs of Gabala city, which for six centuries (until the VIth century) was the capital of Caucasian Albania, and famous for the beautiful wall paintings of Khan Palace in the old Sheki town. The Second Plenary Meeting and Field Trip made the following possible for the participants: (1) To discuss the actual status of our knowledge of a range of subjects, as well as scientific approaches to integrating environmental, anthropological, ethnological, and archaeological data in order to trace the history of ancient humans from the Caspian to the Mediterranean during the entire Quaternary. (2) Introduce young scientists, especially from the Eastern countries, to new analytical techniques and state-of-the-art interpretation of data. (3) Encourage east-west dialogue and integrate researchers from different countries into the international R&D community, as well as contribute to the preservation of cultural and religious heritage through the discussion of ancient cultures, civilizations, and their legends. The two days of Technical Sessions were organized into five panels and five Oral/Poster sessions. Panel 1 was titled "RECENT ECOSYSTEMS AND PROCESSES"—moderators: Nelly Sergeeva (Russia) and Valentina Yanko-Hombach (Ukraine, Canada)—and included five ORAL

presentations. The presentations covered a range of topics on recent environments and ecosystems of the Caspian-Black Sea-Mediterranean Corridors. Panel 2 was titled “STRATIGRAPHY, PALEONTOLOGY, AND PALEOENVIRONMENTAL RECONSTRUCTIONS”—moderators: Nikolay Panin (Romania) and Andrey Chepalyga (Russia) —and included 19 ORAL presentations with a key-note talk by Profs. Yanina and Svitoch (Russia). The presentations covered a range of topics on Quaternary ecostratigraphy and paleogeographic reconstructions of the Ponto-Caspian and Marmara region. Panel 3 was titled “TECTONICS”—moderator: Hayrettin Koral (Turkey)—and included three presentations on the earthquakes of Eastern Turkey, interrelationships between sea-level changes and tectonics in the southern Black Sea coasts of Turkey, and modern active tectonics in Azerbaijan. Panel 4 was titled “MODELLING”—moderators: Nikolay Esin and Alexander Kislov (Russia)—and included five presentations devoted to modeling of coastline migration, climate change and infilling of the Black Sea by Mediterranean salt water over the course of the Holocene transgression. Panel 5 was titled “ARCHAEOLOGY, HISTORY, AND ETHNOLOGY” —moderators: Andrey Chepalyga (Russia) and Olena Smyntyna (Ukraine)—and included five presentations with a key-note talk by I. Babaev (Azerbaijan). The presentations were devoted to the North Black Sea passageway for the first peopling of Europe, ties between Southeast Caucasus and Mediterranean countries in antiquity, influence of paleoecological changes on migration and economic activities of the Neolithic people of Azerbaijan, and archaeological landscape of Gobustan at the end of the upper Pleistocene and early Holocene. The POSTER session included 23 poster presentations that were organized into five topics: GEOMORPHOLOGY—moderator: Ekaterina Badyukova (Russia); RECENT ECOSYSTEMS AND ENVIRONMENTAL MONITORING—moderators: Nelly Sergeeva (Russia) and Valentina Yanko-Hombach (Ukraine, Canada); SEA LEVEL CHANGES AND PALEOENVIRONMENTAL RECONSTRUCTIONS—moderators: Nikolay Panin (Romania) and Andrey Chepalyga (Russia); PALYNOLOGY AND PALEONTOLOGY—moderators: Petra Mudie (Canada) and Valentina Yanko-Hombach (Ukraine, Canada); ARCHAEOLOGY, HISTORY, AND ETHNOLOGY—moderators: Mehmet Özdoğan (Turkey) and Olena Smyntyna (Ukraine). The Technical Sessions were followed by the Round Table that enabled participants to discuss the progress of IGCP 610 and to plan future strategy in running the project. For more details see Conference Programme. The five days of field trips (by bus) were led by prominent Azerbaijani geologists and archaeologists and were focused on the Apsheronian stage sediments, the classic stratotype of the Mountain of Bakinian stage, examples of the rapid Caspian Sea level changes in the Pleistocene successions, Azerbaijan mud volcanoes, Western Azerbaijan and the Greater Caucasus continuous outcrop of Quaternary continental sediments of the Ajinour, reference outcrop of the marine Bakinian sediments at Bozdag, as well as archaeological sites of Gobustan, Gabala, and historical sites of Baku and Lagich (Figure 1). For more information see the Field Trip Guide 2014 and reference to it.

Outcome

- The 186-page Proceedings of the Second Plenary Meeting (Figure 2) contains contributions from 124 scientists from two continents and eighteen countries; 71% of the contributors were from developing countries (Figure 3).
- The 34-page Field Trip Guide describing the Azerbaijan Quaternary geology and geological and archaeological sites visited during the Field Trip.
- Special Volume of *Quaternary International* that will collect selected articles presented at the meeting. It is planned for publication within the 2015 volume.
- Broadcast of IGCP 610 by a number media sources:

<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+plnar+iclası+ishine+bashlayib>
<http://topnews.az/news/755360/Bakida-Beynelxalq-Geologiya-Elmlari-Proqraminin-610-sayli-layihasinin-ikinci-plnar-iclası-ishına-bashlayib.html>

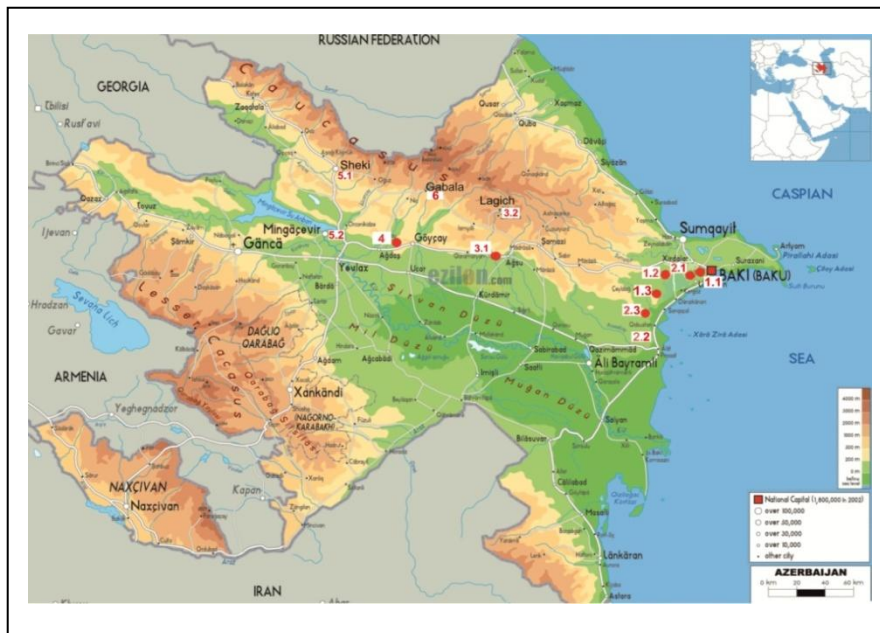


Figure 1. Map of Azerbaijan with geological and archaeological sites visited during the Field Trips on October 15 (# 1), 16 (# 2), 17 (# 3), 18 (# 4), 19 (#5), and 20 (#6), 2014

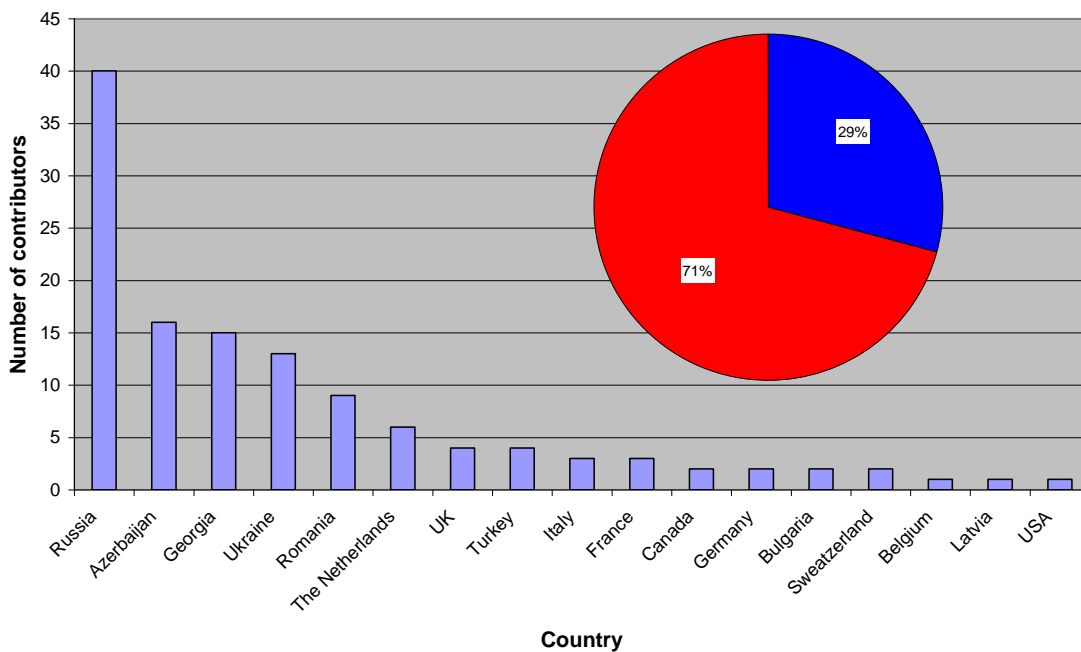


Figure 2. Number of countries and contributors to the IGCP 610 Second Plenary Conference and Field Trips in Baku, Azerbaijan. The circle shows the percentage of scientists from developing (red) and developed (blue) countries, respectively

- a number of video films and photo galleries (devoted to the Second Plenary Meeting and Field Trip of IGCP 610 (e.g., <https://www.facebook.com/media/set/?set=oa.241497582675250&type=1>).

Overall, the meeting provided an excellent opportunity for international discussion of different methods and interpretations used to analyze the history of a huge geographical area from the Caspian to the Mediterranean seas during the full duration of the Quaternary. It encouraged an exchange of data and publications, as well as assisted in future collaboration between physical and social scientists across the globe. The meeting brought together multidisciplinary scientists from all over the world, and in the process enhanced West-East scientific dialogue by providing a supportive background for collaboration regarding the correlation and integration of discoveries on the influence of climatically/tectonically induced sea-level changes and coastline migration on humanity.

5. Educational, training or capacity building activities

So far IGCP 610 activities:

- enabled participants to visit relevant sites in the Caspian region of the CORRIDORS under the guidance of local experts with on-site discussion of scientific issues; formed a platform for young undergraduate and postgraduate students to benefit from international exposure and interaction with scientists from different parts of the world and varied specialties in order to cultivate traditions of “European style” scientific fora as well as scientific discussion and informal meetings. This also promoted their interest in particular specialties and motivated them to learn foreign languages in order to improve communication skills with western colleagues
- promoted a multidisciplinary approach in paleoenvironmental studies, which has encouraged students in geology to take archaeological courses and *vice versa*. This has stimulated teachers to modify their curricula for undergraduate and graduate students; promoted the preparation of several MA and PhD theses on subjects within the IGCP 610 project
- encouraged the establishment of direct contacts between western and eastern youth, creating the background for better understanding of modern priorities in the developing world of science and humanities
- exposed the younger generation in developing countries to new analytical techniques and state-of-the-art data interpretation in the field of sustainable development and environmental risk protection, as well as human cultural development; informed the wider public about the evolution of the environment during the Quaternary

6. Activities planned

1) Efforts are ongoing:

- to maximize IGCP 610 exposure via diffusion of results in key international journals and updates of our web pages to ensure wide accessibility and increased interactive potential for project participants, the scientific community at large, relevant agencies, and the public
- to consolidate scientific achievements as a basis for developing future strategies
- to continue to augment the funding base with upcoming and submitted research proposals through various funding agencies
- to publish the next special volume of *Quaternary International* devoted to the achievements of IGCP 610

2) Meetings and field trips planned (and completed) include:

- the Third Plenary Meeting and Field Trip, Astrakhan, Russia (22-30 September 2015)
- 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 T138 “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

- Field research of the Working Group of Moscow University and Denmark in the Lower Volga area and Kalmykia (May, 2015) focused on preparation of the field trips during the Third Plenary Meeting and Field Trip in Astrakhan. The field group examined the sections at Srednyaya Akhtuba, Nizhnee Zaimische, Cherniy Yar, Seroglazovka, Lenino, Kopanovka, and Tsagan-Aman in Astrakhan vicinity.
- field trip to the Black Sea littoral areas of Bulgaria for visiting archaeological sites (Spring 2015)—organizer M. Özdoğan
- research cruise on R/V “Mare Nigrum” in the Black Sea—organizer N. Panin

7. List of selected publications by IGCP 610 participants in 2014-2015

- Akçar, N., Yavuz, V., Ivy-Ochs, S., Reber, R., Kubik, P.W., Zahno, C., and Schlüchter, C., 2014. Glacier response to the change in atmospheric circulation in the eastern Mediterranean during the Last Glacial Maximum. *Quaternary Geochronology* 19: 27-41.
- Bezrodnykh, Y.P., Deliya, S., Romanyuk, B., Sorokin, V.M., and Yanina, T.A., 2015. New data on the upper Quaternary stratigraphy of the North Caspian Sea, *Doklady Earth Sciences* 462(1): 479-483.
- Bondarev I. P., 2014. Komplex molluskov roda *Theodoxus* (Gastropoda, Neritidae) v golocenovykh otlozheniya Sevastopol'skoi buhty [Complex of the mollusk genus *Theodoxus* (Gastropoda, Neritidae) in Holocene sediments of Sevastopol Bay]. *Marine Ecological Journal* 13(3): 32. (In Russian)
- Catianis, I., Rădan, S., and Grosu, D., 2014. Loss of ignition as a proxy indicator for assessing the lithological composition of the recent sediments accumulated in some freshwater lakes from the Danube Delta, Romania. *International Journal of Innovation and Applied Studies* 9(1): 260-278.
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