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Annotated Bibliography of Soviet Papers on Quaternary Shorelines and Sea-Level Changes, 1983–1986

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ABSTRACT

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This bibliographical list continues the previous one, which covered the 1978–1982 period (see: USSR, in: Annotated Bibliography of Quaternary Shorelines, fourth supplement, by H.G. Richards, *et al.*, *Journal of Coastal Research*, Special Issue 2, Autumn 1986).

Investigations were coordinated by the Soviet National Working Group of the Project-200 IGCP Sea-Level Correlations and Applications. This bibliography is prepared by the Secretary of the Working Group, Dr. Andrey O. Selivanov and edited by the Leader of the Group, Professor Paul A. Kaplin.

Some papers on the problem appeared in the following volumes in Russian:

Age and Genesis of Shelf Overdeeping and River Valleys History, 1984. Moscow: Nauka Publishing House (abbreviated AGSO);

Geology and Geomorphology of Shelves and Continental Margins, 1985. Ed. by M.N. Alekseev. Moscow: Nauka Publishing House (abbreviated GGS);

Geochronology of the Quaternary Period. Abstracts All-Union Conference Moscow, November 18-21, 1985 (abbreviated GQ);

Peculiarities and Regularities of Land Water Formation, 1986. Ed. by R. Klige, I. Zektser. Moscow: Water Problems Institute Academy Science USSR. In two volumes (abbreviated PRLW).

A dozen papers and reports appeared in English in The *Journal of Coastal Research* (Coastal Education and Research Foundation, Charlottesville, Virginia, USA).

ALEKSEEV, M.N.; CHISTYAKOV, A.A., and SHCHERBAKOV, F.A., 1986. *Quaternary Geology of Continental Margins*. Moscow: Nedra Publishing House, 243p. (In Russian).

Chapter 1. Processes and forms of accumulation of continental margin Quaternary sediments. Chapter 2. Facies differentiation of marine sediments (wave zone, shelf zone, continental slope, continental rise). Chapter 3. Stratigraphy of Quaternary sediments and continental margin paleogeography, Pleistocene events of the Black Sea, Atlantic USA and Canada, Arctic Canada, SE Asia, the Andamana Sea, the Japan Sea, and the Kelt Sea are reviewed. The continental margin of outer seas is shown to be a zone of active sediment differentiation and redeposition during the last glacial maximum. On the continental margin of inland seas (such as the Mediterranean and the Black seas) continuous marine sequences formed during the whole last glacial cycle. The Black S. L. during the last glacial maximum (18-17,000 BP) reached –80-90 m while the ocean level stood at –120-130 m. Chapter 4. Application of Quaternary continental margin investigations.

ALESHINSKAYA, Z.V.; VOSKRESENSKAYA, T.N.; BOLIKHOVSKAYA, N.S., et al., 1986. Pleistocene terraces of the eastern and western Sakhalin Island coasts. In: *Problems of Pleistocene Paleogeography and General Physical Geography*. Pt. I. Moscow State University pp. 85-93 (In Russian).

According to palynological, diatomical, paleomagnetic and ^{14}C analyses data only +15 m terrace seems to be marine (second half of the Late Pleistocene). +15 m surface is of continental origin.

ARSLANOV, Kh.A.; GEY, N.A.; IZMAYLOV, Ya.A., *et al.*, 1983. On the age and palaeocli-

mates of the Late Quaternary marine terraces in the Kerch Strait region. In: *Proceedings Leningrad University,* No. 12, pp. 69-79 (In Russian).

Ionium-uranium dates of mollusk shells 107-115,000 BP permit correlation of the Karangatiax transgression of the Black Sea with the Eemian. Minimum age determinations of ferrous shells are 60-70,000 BP.

BADYUKOV, D.D., 1986. Ancient shorelines as indicators of sea level. In: *Journal of Coastal Research,* 2(2), 147-157 (In English).

Careful investigations are necessary to pinpoint the actual position of the water level within a certain range. The paper deals with major geological and biological indicators of abandoned shorelines, such as abrasion terraces, wave-cut notches, beach ridges, aggradational terraces, beach-rock and oolite formations, peat marsh and mudflat deposits. Distribution range of various indicators in relation to s.l. is tabled.

BADYUKOV, D.D.; DEMIDENKO, Ye.L.; KAPLIN, P.A., and NIKOLAEV, S.D., 1986. Geomorphology and Late Pleistocene development of the Seyshelles and Amirant shoalbanks. In: *Okeanologiya,* XXVI(2), 273-281. (In Russian, English summary).

Several abrasion surfaces and erosional river networks of the glacial period were found by diving, echosounding, submarine photographs, subbottom profiling and bottom sediment core studies. Temporal changes in sedimentation processes were related to geomorphological changes during the Holocene transgression. Delay of sea level rise (possible small drops in s.l.) are marked about 2-2,500 and 500-1,000 BP.

BIRYUKOV, V.YU. and SOVERSHAEV, V.A., 1985. Bottom relief of the South-Western Kara Sea and its development in Holocene. In: *GGS,* 89-95 (In Russian).

At the beginning of a postglacial transgression the sea level stood between −60 and −100 m. A submerged delta at 30-35 m depth and abrasion platforms at 25, 32-34, 37-38 and 43-44 m depths are distinguished by morphological studies. The abrasion platforms are supposed to be connected with the periods of sea ice (relative) degradation 8-9, 10, 11-12 and 13,000 BP.

BOGDANOV, N.A., 1984. Some problems of coastal placer formation on the south-eastern Baltic coast and their suggested development during the Holocene. In: *Geomorfologija = Geomorphology,* 4, 30-32 (In Russian, English summary).

Marine placer formation is connected with the processes of bar and barrier-beach development (such as Ventspils, Liepaya, Kurshu, Visla barriers) and extensive differentiation of debris in relatively closed systems of transgressive coasts during the Early Holocene. Now all the barriers are erosional and placers don't receive any noticeable supply.

BOYRSKAYA, T.D.; VVEDENSKAYA, A.I., and POROTOV, A.V., 1985. Late Pleistocene and Holocene lagoon sediments of the Tatar Strait. In: *Geomorfologija = Geomorphology,* p. 118-122 (In Russian).

Three submerged lagoon complexes are differentiated: −45-55 m (the end of the Late Pleistocene), −25-35 m (Subarctic period) −10-12 m (second half of the Boreal Period—the beginning of the Atlantic; 14 = 7950 + 280).

BRYZGALOVA, M.M. and BIDZHIEV, R.A., 1986. History of the North Western Siberian marine basins. In: *Proceedings USSR Academy Sciences, ser. Geographic,* 1, 81-93 (In Russian).

Active submergence of the region from the Early Pleistocene to the beginning of the Late Pleistocene had a maximum amplitude of up to 120 m (Salekhard time). Ice rafting and iceberg facies dominated. Eemian (Kazantsevo) time coincided with the regressive epoch.

BYLINSKY, E.N., 1985. On the global character of glacioisostatic processes within the Earth platform regions during the Pleistocene. In: *Geomorfologiya = Geomorphology,* 1, 22-36 (In Russian, English summary).

Two large regions differing in Quaternary marine terrace topography (buried or exposed) and shelf structure are established within the Earth Platforms. The first region includes areas of Pleistocene glaciations, the second one—unglaciated areas. Probable mechanism of deformations is discussed in connection with global impact of isostasy on

the Earth structure evolution during the Pleistocene.

CHEPALYGA, A.L.; YANKO, V.V.; OS'KINA, N.S., and BLYUM, N.S., 1984. The Early Quaternary marine basin in the Black Sea region. In: *Stratigraphy and Lithology of Mezozoic and Cenozoic Ocean Sediments: Abstracts 1st All-Union Conference (Odessa)*, 1 (In Russian).

Based on a new data from the NE Black Sea coasts a hypothesis of the first Mediterranean invasion into the Black Sea basin at the end of the Chauda epoch (the Early Pleistocene) is proposed. The term "Karadeniz transgression" is suggested.

CHEPALYGA, A.L.; KARPOV, V.L., and ARSLANOV, Kh.A., 1984. Pleistocene marine transgressions of the Black Sea north-western shelf. *Ibid* (In Russian).

The Karangatian transgression deposits (Io/U and 14 dates 35-150,000 BP) are found from −2 to −26 m altitude. The Danube delta was a lagoon in this period. The Surozhian transgression (25-35,000 BP) did not exceed −30-35 m.

DANILOV, I.D., 1985. The Northern Eurasian continental margin development in the Late Cenozoic. In: *GGS*, 48-57 (In Russian).

Three stages of the continental margin development were connected with the long-term tectonic movements. The first and the third stages were of regressive character and the second one (most of the Pliocene and the first half of the Pleistocene)—of transgressive character. (Rhythmicity) of sedimentation and terrace formation depend on superimposed movements of another origin.

DOBROVOLSKY, S.G., 1984. Eustatic ocean level fluctuations and global water balance components changeability. In: *Oceans and Life (Voprosy Geographii = Geographical Problems*, v. 125). Moscow: Mysl' Publ. House, pp. 122-130 (In Russian).

DZIUBA, A.V.; DOBROVOLSKY, S.G., and KLIGE, R.K., 1984. On the eustatic ocean level fluctuations and their predictions. In: *Meteorology and Hydrology*, 7, 56-62 (In Russian, English summary).

Modern eustatic fluctuations of the global means s.l. and long-term changes of world water budget components are considered. Possible mechanisms of antropogenic changes of the global mean s.l. in the future are discussed. An assumption is made on the atmospheric feeding of the Antarctic ice sheet as a basic factor of eustatic s.l. changes in recent decades. Versions of simple statistical forecasting of eustatic fluctuations are presented.

DZIUBA, A.V., 1986. On the influence of some hydrometeorological processes and long-term changeability upon global mean ocean level. In: *PRLW*, I, 124–132 (In Russian).

Antarctic ice melting appears to be the only significant factor of random non-correlated and non-stationary processes of global mean ocean level changes in the past 200 years. In the next few decades the CO_2 greenhouse effect will result in Antarctic precipitation and a non-significant fall of ocean level (0.10-0.15 m to 2050).

DZIUBA, A.V.; DOBROVOLSKY, S.G., and KLIGE, R.K., 1986. On the long-term changes in main global water exchange components. *Ibid.*, pp. 23–42.

FEDOROV, P.V., 1985. On the problem of the Black Sea level changes during the Pleistocene. In: *GGS*, pp. 131-136 (In Russian).

Every glacial cycle caused the Black Sea to change from a brackish enclosed lake of Caspian type to a running lake and then to an interior sea of recent type. Flow to the Caspian Sea is denied by paleontological data.

GEORGIEV, V.M., 1984. Carbonate cementation of the Holocene nearshore beach ridge, Burgas Bay, Black Sea. In: *Geol. Balcan.*, 14, 39-56 (In English).

Non-tropical litification of the nearshore sediments occurred 3000-2500 BP when s.l. stood 10 m below the present.

GORSHKOV, S.P. and SVITOCH, A.A., 1986. Beringia during the last glacial epoch. In: *Priroda = Nature*, 3, 55-56 (In Russian).

The paleogeographical development is outlined.

GOZHIK, P.F., 1984. Regressive stages in the Late Cenozoic Black Sea history and their reflection in the river network development. In:

Studies of Geological History and Modern Sedimentary Processes of the Black and Baltic Seas: Transactions International Symposium. (Kiev, March 14-18, 1983). Pt. I, pp. 100-102 (In Russian).

GROSWALD, M.G., 1983. *Ice Sheets of the Continental Shelves.* Moscow: Nauka Publishing House, 216p. (In Russian, English summary).

The book presents a global view of the present-day and former (mainly Weichselian) marine ice sheets (ice, shelves) depending upon ocean level variations. During global ice-age maxima the West Antarctic ice shelf repeatedly expanded to fill the Ross and Weddell Seas. At the same time the so-called Panarctic Ice Sheet extended from Alaska and Greenland to the Taimyr Peninsula covering an area $35 \cdot 10^6$ square km with a volume $60 \cdot 10^6$ cubic km. A similar ice shelf in Beringia was an order of magnitude smaller. A reconstruction of the last ice shelves at maximum epoch (17-21,000 BP) is proposed. Massive discharge of ice into the ocean with surges and calving could affect the global climate and s.l.

IZMAYLOV, Ya.A.; CHEPALYPA, A.L., and BALABANOV, I.P., et al., 1984. The "Karangatian problem." In: *Geology of Oceans and Seas: Abstracts 6th All-Union Marine Geology Courses.* Gelendzhik, Vol. 3 (In Russian).

Three "karangatian" terraces (+40+45, +20+25, +10+15 m) are in existence at the Caucasian coast (Gelendzhik-Sukhumi). The first one is 118-139,000 BP, the 2nd and 3rd—74-76,000 BP (Io/U). They are correlated to the Tyrrhenian formations in Tunisia.

IZMAYLOV, Ya.A., 1986. River delta history and interior sea coastlines (exemplified by the Eastern Azov and Black Seas). In: *Geology of Oceans and Seas: Abstracts 7th All-Union Marine Geology Courses.* Gelendzhik, Vol. 1, pp. 191-192 (In Russian).

KAPLIN, P.A., 1984. International studies on ocean level changes (The new project of IGCP) In: *Okeanologija = Oceanology,* XXIV(4), pp. 709-710 (In Russian).

Purposes and official structure of the Project 200 are described.

KAPLIN, P.A., 1985. Quaternary Coastlines. In: *XI INQUA Congress: Results and Perspectives.* Moscow: Nauka Publishing House, pp. 33-44 (In Russian).

Review of the congress reports.

KAPLIN, P.A. and SELIVANOV, A.O., 1985. Pleistocene marine terraces absolute chronology. In: *GQ,* p. 52 (In Russian).

More than 700 dates of raised Pleistocene shorelines are reviewed statistically. Most raised shorelines formed 70-90, 110-140, 200-230, and also 300-370 and 500-600 thousand years BP. Global mean s.l. in the Early Pleistocene seems not to exceed +20+25 m, in the Middle and Late Pleistocene +10 +12 m. Global s.l. surface during the Eemian interglacial was similar to the recent one, but differed considerably about 30-40 thousand years BP (when the mean s.l. was probably some tens of meters lower than today's).

KAPLIN, P.A., 1986. Types of the ocean level changes. In: *Geomorfologija = Geomorphology,* 3, 16-22 (In Russian, English summary).

The paper summarizes quantitative data on rates and amplitudes of 13 genetic types of hydrocratic and geocratic ocean level changes during the Cenozoic. Some types are of global character and long duration, others are local and short-term.

KAPLIN, P.A. and SHCHERBAKOV, F.A., 1985. Reconstruction of shelf environments during the Late Quaternary. In: *Quaternary of South America and Antarctic Peninsula.* Edited by J. Rabassa, 3, 221-226 (In English). Also in: *Journal of Coastal Research,* 1986, Special Issue 1, pp. 95-98 (In English).

Information on the IGCP-200 Soviet working group activity in shelf mapping. Series of the USSR shelf paleogeographical maps for the Wurmian interstadial, the last glacial maximum and the Holocene climatic optimum is in preparation. Principles of mapping are exemplified by the Black Sea shelf map.

KAPLIN, P.; PIRAZZOLI, P.A.; PAVLIDIS, Yu., and BADENKOV, Yu., 1986. Sea-level and environmental changes in shelf areas of the Western Indian Ocean. In: *Journal of Coastal Research,* 2(3), 363-367 (In English).

The first results of an international expedition of the R/V "Professor Shtokman" under

the auspices of IGCP-200 (Jan.-Feb. 1986). See: Badyukov, Demidenko *et al.*, 1986.

KAZANSKII, A.B., 1985. Analysis of the global water balance equation for the past ocean level changes study. In: *Okeanologija = Oceanology,* XXV(2), 228-234 (In Russian, English summary).

KAZANSKII, A.B., 1985. A hypothesis for the saw-like pattern of world sea-level fluctuations. In: *Quaternary Research,* 24(3), 285-294 (In English).

The theory is based on the assumption of primarily climatic character of global ocean land water exchange variations. The theoretical saw-like curve seems to be in agreement with the data on ocean level since the last glacial maximum. The theory permits removal of a false contradiction between the ancient coastlines and bottom sediments isotopic composition data.

KESSEL, Kh. and RAUKAS, A., 1984. On the geological correlation of the ancient Baltic shorelines in Estonia and Sweden. In: *Proceedings Estonian SSR Academy Sciences,* 33(3-4), 146-157 (In Russian, English summary).

KHERSHBERG, L.B.; RYAZANTSEV, A.A.; GUS'KOV L.G.; SHUMULEV, V.G., and NAUMOV, Yu.A., 1986. Submerged shorelines on continental shelves of the Sea of Japan and Sea of Okhotsk, USSR. In: *Journal of Coastal Research,* 2(1), 61-68.

Each shoreline complex includes lagoon and nearshore sediments and relief features. Two transgressions are distinguished in the Late Pleistocene. The late glacial-postglacial transgression began from 110-134 m depths 17,000 years BP. Three submerged shorelines were formed until the end of the Pleistocene. The second and the third of three Holocene shorelines are 3 to 5 m above mean s.l.

KISELEV, I.I., 1985. Cenozoic stratigraphy of the Murman region. In: *Quaternary Sediments of USSR North-West and Their Applicability to Mineral Deposits,* Leningrad, pp. 49-64 (In Russian; draft, unpublished).

Late Quaternary marine deposits are found up to +252 m.

KLIGE, R.K., 1985. Variations of Global Water Exchange. Moscow: Nauka Publishing House, 248p. (In Russian).

Chapter 7. Tendencies in the world ocean water regime changes. 7.1. Thermic regime of surface waters, 7.2. Ocean ice cover changes. 7.3. S.L. fluctuations. Chapter 8. Dynamics of global water balance. 8.1. Water exchange process. 8.2 Land water balance. 8.3 Ocean water balance. 8.4 Connection of world water balance with some geophysical peculiarities.

KOROTKII, A.M., 1985. Quaternary sea-level fluctuations on the north-western shelf of the Japan Sea. In: *Journal of Coastal Research,* 1(3), 293-298 (In English).

Recent investigations prove that Quaternary marine terraces above +8+10 m are absent in the region and s.l. changes were primarily of glacioeustatic origin. Two terraces formed in the Mid and Late Riss-Wurm (or in the Early Wurm). An emerged Middle Pleistocene shoreline (220,000 BP by thermolum inescence dating) is supposed. In the Early Wurm s.l. fell to − 90-100 m, in the Late Wurm — to −95-115, or even −130 m (^{14}C = 14,100-13,900 BP). The Middle Wurm (Karginian) shoreline is situated 15-20 m below the present s.l. Early postglacial stands were studied at 80-90, 52-60 and 42-58 m depths. The Japan Sea levels during that period could be considerably different form the open oceanic ones. In the Middle and Late Holocene s.l. fluctuated twice or more from − 2-4 to +4 m.

KOSHECHKIN, B.T., 1984. Dynamics of the Pleistocene glaciation and the character of marine transgressions in Northern Europe. In: *Proceedings USSR Geographical Society,* 116(4), 323-328 (In Russian).

Growth of the Fennoscandian glacier thickness during each Pleistocene glacial hemicycle resulted in "iceshed" migration to the S and asymmetrical spatial character of post-glacial transgressions.

KUPRASH, R.P., 1984. Quaternary marine sediments of the Southern Crimea nearshore zone and their continental analogues. In: *AGSO,* pp. 59-63 (In Russian).

KUZ'MINA, N.N. and TALDENKOVA, E.Ye., 1984. *Holocene Sediments and Malacofauna of*

the Japan Sea Shelf (Kievka Bay). Moscow State University (In Russian, unpublished).

By underwater drilling and coastal studies the s.l. is supposed to rise from −48 to −36 m during the Early Holocene (10,300-8,000 BP), then to reach +2,5 + 4 m in the Middle Atlantic and the Middle Subboreal periods. AT/SB boundary is marked by regression.

KUZ'MINA, N.N.; POLYAKOVA, E.I.; SHUMOVA, G.M.; VOSKRERSENSKAYA, T.N., and NEDESHEVA, G. N., 1985. The Middle Pleistocene sediments of the Japan Sea shelf. In: *Reports USSR Academy Sciences,* 282(3), 679-685.

KUZ'MINA, N.N. and PARUNIN, O.B., 1985. Absolute dating of the Pleistocene and Holocene sediments on the Japan Sea shelf. In: *GQ,* p. 66 (In Russian).

Marine transgression in the Middle Pleistocene is dated by thermoluminescence method 180 + 45 thousand BP, the Late Pleistocene transgressions −130 + 33 thousand BP (thermoluminescence) and 21, 4 + 4 thousand BP (^{14}C). They are coincided with interglacials.

KVASOV, D.D., 1983. Causes of the sharp regression of the Black and Caspian Seas about 5 million years ago. In: *Okeanologija = Oceanology,* XXIII(3), 444-449 (In Russian, English summary).

Levels of the salt lakes in the recent Mediterranean region were very low in the Messinian time. So one of the southern Balkanian Rivers (the Vardar or the Maritsa) captured the Danube River headwaters. This resulted in the lowering of the Pontic Sea level and formation of the Balakhan Basin in the Southern Caspian Sea (5 to 3.3 million BP). Soon (in about 100,000 years) erosion in the lower Danube reaches caused the river runoff growth. The brackish Kimmerian Sea was formed in the Black Sea depression and the Akchagylian Basin—in the Caspian depression.

LAZUKOV, G.I., 1983. Ocean transgressions and regressions, climate and glaciations. In: *Proceedings Moscow University Series Geography,* No. 5, pp. 21–28 (In Russian, English summary).

The concept of Pleistocene continental glaciations coincidence with the Polar Basin transgression epochs is evolved. A wide occurence of glacio-pelagic deposits laterally replaced by continental moraines testifies the hypothesis. The main cause of the process seems to be the tectonic movements of global origin. The glacioeustasy played only a minor role.

LEONTIEV, O.K.; ZHINDAREV, L.A., and RYABKOVA, O.I., 1985. On the morphology and genesis of the Kurshu Spit. In: *Geomorfologija = Geomorphology,* 4, 86-93 (In Russian, English summary).

According to field experiments and surveys the Kurshu Spit (SE Baltic Sea in the Kaliningrad Region and in Lithuania) appeared to be not a spit created by longshore drift but a coastal barrier formed by transversal movement of deposits (from the sea floor). It was formed in the Late Litorina time when the lagoon level was 5 to 7 m above present one. The conclusion is of primary importance for coastal protection measures.

LISITSIN, A.P., 1984. Turbidity sedimentation, ocean level changes, pelagic sediment nonconformities as global regularities. In: *Abstracts XXVII International Geological Congress Session* (Moscow) 9(1), 220-221 (In English, Russian).

MATISHOV, G.G., 1984. *Ocean Bottom During Glacial Periods*. Moscow: Nauka Publishing House, 176p. (In Russian).

The author describes structure and formation processes of glacial and periglacial shelf landforms termed "oceanic periglacial." In every glacial hemicycle from the Eopleistocene (1.8-3.3 millions years BP) continental glaciers occupied most of the North Atlantic and Norwegian-Greenland shelves up to the continental slope border. Ice rafting and turbidity currents in shelf canyons prevailed. In postglacial time periglacial relief features were of relic character. The problem of strandflat formation is mentioned.

MATSUY, V.M. and MOS'KINA, V.D., 1985. *Stratigraphy of the Pleistocene Boundary Sediments at the Northern Azov Sea Coast.* Kiev: Ukranian SSR Geological Institute, 36p. (In Russian).

MEDVEDEV, V.S.; IONIN, A.S., and PAVLIDIS, Yu.A., 1985. Evolution of coral reefs and "reefogenic shelves." In: *GGS*, 35-48 (In Russian).

Mid-oceanic, transition zone and continental shelf coral reef structures are distinguished. All underwent three stages in their development: pre-Pleistocene, Pleistocene and Holocene. Development of coral reef island structures during the Pleistocene regressive stages is considered exemplified by Cuba and Pacific atolls.

MOROZOVA, L.N., 1985. Late Pleistocene (Sartanian) regression level on the Eastern Siberian shelves. In: *GGS*, 85-88 (In Russian).

Deltaic complexes of the last glacial maximum on the Eastern Siberian shelves occur at −50-55 m because of intensive sea ice cover while in the Western Arctic shelves rivers of that period reached 100-110 m depths.

MYAGKOV, S.M., 1986. New reconstruction of the Antarctic glaciation during the Late Valday (Wurm). In: *Antarctica*, 88-98 (In Russian).

Mathematical modelling shows non-equilibrium character of Antarctic glaciation sensitivity to the climatic changes in the last 150,000 years. Ice volume reaches its maximum (+10% from the modern) during the Mikulino (Eem) interglacial and minimum (−10%)—during the Early Valday (Wurm). Thus some revision of global eustatic s.l. curves is desirable.

NIKIFOROV, S.L., 1985. Underwater accumulative features of the Eastern Siberian shelf. In: *GGS*, 96-100 (In Russian).

Three to nine generations of submerged bars are proposed to form during the period of s.l. fall up to −100-120 m in first part of the Late Pleistocene.

PALATNAYA, N.N. and KARPOV, V.A., 1984. Karangatian sediments of the North-Western Black Sea. In: *Reports Ukranian SSR Academy Sciences, series B*, 12, 19-22 (In Russian, English summary).

PALATNAYA, N.N., 1985. Karangatian sediments of the Danube delta region (within the USSR borders). *Ibid., 3*, 23-25 (In Russian, English summary).

PAVLIDIS, Yu.A.; IONIN, A.S., and MEDVEDEV, V.S., 1985. Late Wurmian paleogeography of Beringian shelf. In: *GGS*, 65-76 (In Russian).

Geomorphological, geological and lithological-stratigraphical data permit reconstruction of a paleogeographical map for the maximum of the Late Wurmian regression. The whole Beringian shelf was subject to continental morphogenesis in very arid and cold conditions. The outer part of the shelf was covered by ice which was emplaced during the regression period.

PAVLIDIS, Yu.; BADENKOV, Yu.; KAPLIN, P.; MEDVEDEV, V., and PIRAZZOLI, P.A. Variations niveaux marine aux Quaternaire: Ocean Indiene. *Geochronique*, 1986, 19, p. 17. See Badyukov *et al.*, 1986.

POLISHCHUK, V.V., 1983. Malacological evidences of the considerable Black Sea level rise during the Holocene. In: *Mollusks: Their Systematics, Ecology and Distribution Patterns: Abstracts 7th All-Union Conference* (Leningrad, April 5-7, 1983, 7, 101-102 (In Russian).

Marine and brackish mollusks are in abundance in benthonic samples from the Danube, Dnepr and Southern Bug Rivers lower reaches. This fact confirms the considerable, but short-term, rise of the Black Sea level in the Late Holocene.

POPOV, G.I., 1983. *Pleistocene Deposits of the Black Sea—Caspian Straits: Stratigraphy, Correlation, Paleofauna and Geological History.* Moscow: Nauka Publishing House, 1983. 215p. (In Russian).

Stratigraphical and paleogeographical conclusions are based mainly on malacological characteristics of cores from the Manych and Kerch Straits.

PRIVALSKY, V.E., 1985. *Climatic Variability (Stochastic models, Predictability and Spectra).* Moscow: Nauka Publishing House (In Russian).

Chapter 3. Stochastic models and predictability of oceanic processes 3.2 Sea level. Two types of s.l. variations, the zonal and monsoon, are distinguished by respective time series analysis of annual data for 35 stations. Both follow the first-order autoregressive model but the latter has higher statistical predictability and the spectrum

decreasing relatively fast with the frequency growth. Monsoon s.l. variations coincide with sea surface temperature fluctuations in the North Atlantic. Two-dimensional model possess a higher predictability of s.l.

PUMINOV, A.P. and DEGTYARENKO, Yu.P., 1986. On the shoreline dynamics of Russian East Arctic Seas during the Cenozoic. In: *Journal of Coastal Research,* 2(3), 261-267.

It is possible to recognize four major Cenozoic regressive-transgressive cycles along the coast of eastern Arctic Russia. Relic barrier and lagoon facies have been located on the shallow shelf, forming complex on- and offlap facies assemblages. S.l. changes are also reflected in aggradation-degradation stratigraphic sequences in coastal valleys and terraces. It is postulated that the most recent s.l. cycle will culminate in a transgression 2,000 years from now.

PUNNING Ya.-M.K. and RAUKAS, A B., 1985. *Late Quaternary Paleogeography of Northern Europe.* Moscow: Institute Science and Technological Information USSR, 215p. (In Russian).

Review of the latest Soviet and Scandinavian studies.

SELIVANOV, A.O. and STEPANOV, V.P., 1985. Geoarcheological investigations on the Soviet Primorye coast: Their application to interpretations of paleoclimates and former sea levels. In: *Journal of Coastal Research,* 1(2), 141-149 (In English).

Stages and methods of subsistence by ancient peoples are used to infer prior climatic conditions and former s.l. Artifact-bearing sediments, geomorphological position, and the results of granulometric, mineralogical-petrographical, and pollen analyses as well as radiocarbon dates were studied. S. l. rose repeatedly to higher stands (compared to the present). Transgressions occurred about 7,500, 5,500, 3,000 and 2,000 BP and are correlated with the Japan data. Most high s.l. stands coincided with periods of low monsoon index and vice versa. Such a correlation is attributed to the Peterssen-Shnitnikov mechanism. The only exception was the transgression 2,000 BP which responded the Antarctic glaciation reaction to the general glacial-interglacial cycle.

SELIVANOV, A.O., 1986. Possible water regime and shore process changes of the Onega Bay (the White Sea) under artificial regulation conditions. In: *PRLW,* 2, 277-295 (In Russian).

Structure of water and sediment balance of projected freshwater basins in the recent Onega Bay borders prove to be similar to those of a late-glacial fresh lake. "Analogue and antianalogue" method supplemented by statistical correlation of coastal zone transverse profile features with the wave-tide characteristics permits prediction of both tendencies and rates of shore deformation and level regime of an artificial fresh-water basin.

SELIVANOV, A.O., 1986. Application of paleogeographical data to the study of global water balance natural changes and their prediction. In: *Hydrology—2000: Abstracts All-Union Conference* (Moscow), May 20-22, 1986, pp. 212-213. (In Russian).

The most inertial part of the hydrosphere—continental glaciation seems to be near the equilibrium to the Holocene interglacial climate. Spasmodic changes of global water balance structure to glacial type is expected in the next 2 to 15 thousand years. Water accumulation by glaciation can reach 3 to 10 thousand cubic km per year. Thus the global mean s.l. will fall 5 to 20 mm per year. The effect of s.l. rise during the next two or three centuries in the Peterssen-Shnitnikov rhythm will be an order of magnitude smaller.

SHCHEGLOV, A.P., 1986. New data on marine terraces and Pleistocene Black Sea level changes. In: *Geology of Ocean and Seas: Abstracts 7th All-Union Marine Geology Courses.* Gelendzhik, 153-154 (In Russian).

SHCHERBAKOV, F.A., 1983. *Continental Margins in the Late Pleistocene and Holocene.* Moscow: Nauka Publishing House, 214p. (In Russian).

Based on a new genetic classification of shelf, continental slope and rise sediments an outline of continental margins paleogeographical evolution during the glacial eustatic cycle is suggested. Most examples are for the Black Sea. Its levels during the gla-

cial regression maximum couldn't have been lower than −80-90 m.

SLOBODIN, V.Ya., 1985. Global sea-level changes and their significance for the shelf stratigraphy. In: *Stratigraphy and Facies of the Ocean Sediments.* Leningrad, pp. 89-96 (In Russian).

Author divides the general Plio-Pleistocene s.l. cycle into several transgressive (erosional) and regressive (depositional) stages. The Mediterranean terrace series is globally correlated and stratigraphically recognized.

SMIRNOVA, V.M., 1986. Marine transgressions of the Late Middle-Early Late Pleistocene in the Severnaya Dvina River Basin. In: *Proceedings USSR Academy Sciences, series geography,* 1, 114-127 (In Russian).

The peak of the Pleistocene maximum transgression was not sinchronous along the Arctic coast. It coincided with the final stages of Middle Pleistocene glaciation in Kola region, the White Sea and Severnaya Dvina regions, with the last interglacial optimum in Western Europe and Western Siberia and with its early stages in Leningrad region.

SOROKIN, V.M.; KUPRIN, P.N., and CHERNYSHOVE, M.B., 1983. Comparative Late Quaternary paleogeography of the Black and Caspian Seas. In: *Cenozoic Paleogeography of the Caspian and Aral Seas.* Moscow State University Publishing House, 1, 42-52 (In Russian).

Late Quaternary transgressions began at the time of the Kalinin (W_1) and Ostashkov (W_3) glaciations degradation. They reached their maximum in the Caspian Sea region during the first half of the interglacials. In the Black Sea region transgressions continued after the setting of connection with the ocean.

STEPANOV, V.P. and KUZ'MIN Ya.V., 1986. Archeological method in the USSR Far East Holocene sea-level fluctuations investigations. In: *Problems of Pleistocene Paleogeography and General Physical Geography,* Pt.1. Moscow State University, 26-39 (In Russian).

Archeological investigations on the Japan Sea, the Sea of Okhotsk and the Bering Sea coasts allow distinction of transgressive-regressive cycles of small amplitude which are synchronous along the coasts.

VALPETER, A.P., 1984. Ancient shore lines at the shelf and coasts of the Eastern USSR outer seas. In: *Structure of USSR Shelves as a Basis for English Geological Studies Riga,* 13-19 (In Russian).

VEINBERGS, I.G., 1986. *Ancient Coasts of the Soviet Baltic Sea and Other USSR Seas.* Riga, 168p. (In Russian).

Broad review on peculiarities of ancient shorelines (both emerged and submerged) on different stages of destruction. Regional outline for all the USSR seas and largest lakes. General aspects of different types of terrace spectra formation.

VOZOVIK, Yu.I., 1986. The Arctic shelf in the Late Pleistocene and certain problems of paleoglaciology. In: *Journal of Coastal Research,* 2(4), 449-452 (In English).

By analysing Arctic glaciation dynamics the author concludes that the Polar seas underwent glacioeustatic regression much lower in amplitude than is commonly hypothesized, and the maximum regression occurred at the beginning of the Holocene.

ZORUB, L.V., 1984. *Global Relief Evolution and Water Exchange Processes.* Moscow: Nauka Publishing House, 72p. (In Russian).

The author connects climatic, water exchange and global s.l. fluctuations (not excluding the Pleistocene ones) with changes in Earth rotation, tectonic uplift and "mountain-building" processes.