



Calibration of Upper Cretaceous sea level transgression peaks by method of vertical-motionless reference points in epeiric seas sedimentary cover (East European platform).

B. Malkin

("Aerogeophysica", Russia, malkin@aerogeophysica.com)

Cretaceous sedimentary cover of epeiric seas of East European platform (EEP) is convenient for calibration of absolute levels of Upper Cretaceous transgression peaks by method of vertical-motionless reference point. The estimation of a sea level maximal altitude is offered to Early Turonian transgression. The estimation is based on: a) the amplitudes of relative sea level fluctuations during Cretaceous time established before, b) the selection and substantiation of tectonic stability of key section points, and c) some representations about Cretaceous development of the East Europe platform topography and landscapes, allowing to use hypsometric levels of regional stratigraphic unconformity for an estimation of transgression peaks altitude. Ideal reference point for the decision of a calibration task is, of course, detection of a paleocoastal line of the maximal sea transgression within the limits of stable area. Such territory should settle down in an internal part of platform that is to be epeiric paleosea basin. Sedimentary basins of external shelves are more subject to isostatic compensation movements and sensitively react by deformations to changes of tectonic stress.

It is obvious, that conservation of the paleocoastal lines of maximal transgression after tens millions years of subaerial history is extremely improbable: - sediments can be destroyed or submitted by more deep-water facies. For the intracraton areas where conditions of stability are carried out, the simple method of an estimation of absolute sea level can be offered. It is possible to receive the minimal and maximal estimations. The hypsometric mark of a layer plus depth of the sea determined by lithofacial criteria defines a sea level of a sedimentary episode. The received estimation generally less real one as it is authentically not known, what part of a layer was destroyed

by the subsequent erosion. On the contrary, if to hypsographic mark of unconformity level (basis of a layer) we plus a relative amplitude of sea level rise established from complete stratigraphic records for this sedimentation episode, the received estimation will be higher real one as the residual relief of unconformity surface is unknown. Clearly, that for vertical motionless areas (blocks) the calculated minimal transgression level should be less maximal one, and their difference will indirectly characterize a residual relief and reliability of an estimation: - the less this difference, the better key section is suitable as a reference point.

As a result of the calibrations of a curve of fluctuations of a sea level within the limits of the East Europe platform (EEP) for Albian-Campanian time it is possible to draw the following conclusions: 1. Within the limits of the East Europe platform (EEP) there are areas (blocks) which answer to geophysical, structural, stratigraphic and paleogeographic criteria of tectonic stability during the last 100 million years. These areas can be counted motionless in sense of vertical tectonic movements and to use as a reference point for calibration of fluctuations of a sea level recorded in deposits of epeiric seas. The most probable estimation maximal transgression peak of the beginning of Turonian is about **280** meters above contemporary level and it was received for several reference areas. 2. The chosen reference points placed in the central part of EEP are rather far one from another and belong to different structural elements of EEP. Results of calibration the maximal sea level based on different fragments of Albian-Campanian stratigraphic section, including unconformities, have shown almost identical values. Thus maximal (based on unconformities) and minimal (based on lithofacial analysis) estimations also are very close, that testifies weak difference between hypsometric level of unconformities and a sea level in regressive minima during the Cenomanian–Campanian history of EEP. 3. In the Middle Cenomanian EEP central area looked like low polygenetic planation surface. It was generated with significant participation of processes of marine denudation, which are characteristic for the epeiric seas. During the period from the Turonian up to Late Santonian the sea within the limits of considered area has some times flooded the penepain, and some times the sea level fell again, approximately, down to Middle Senomanian level with fast exhumation of this surface and its further exogenous transformation. Stable fragments of this penepain were hypsometrically very close to a level of Paleogene epeiric seas transgression peaks and continued development as low erosional plains basing on a sea level. The initial height of this penepain concerning a nowadays sea level is + 220-250 meters. The most probable estimation of a sea level of Middle Cenomanian regression episode is + 220 meters.