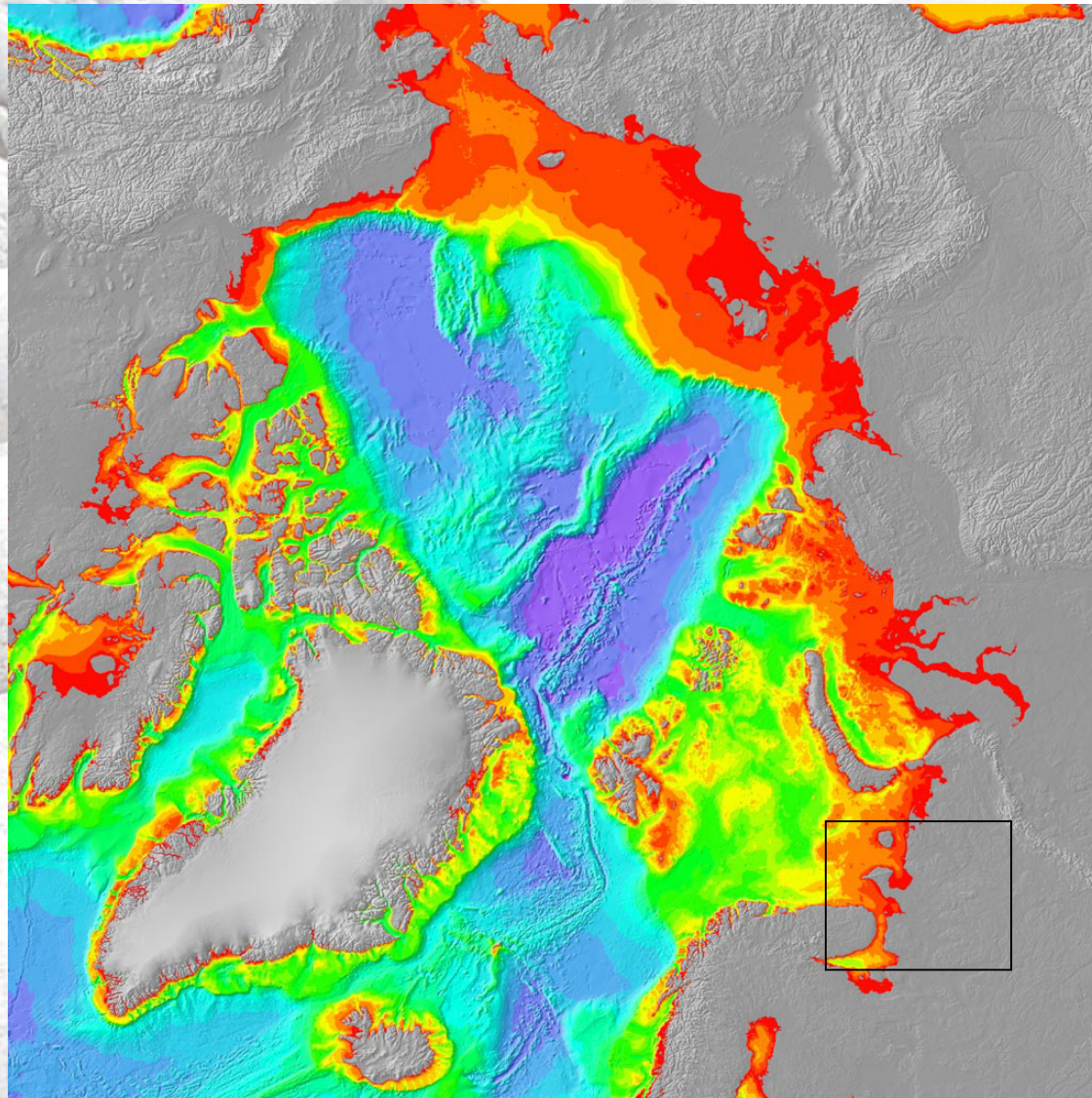


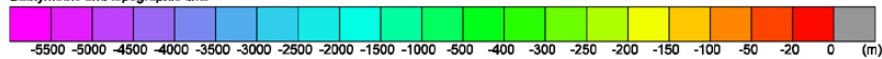


Fluvial response to climate and sea level change,  
Arkhangelsk region, NW Russia



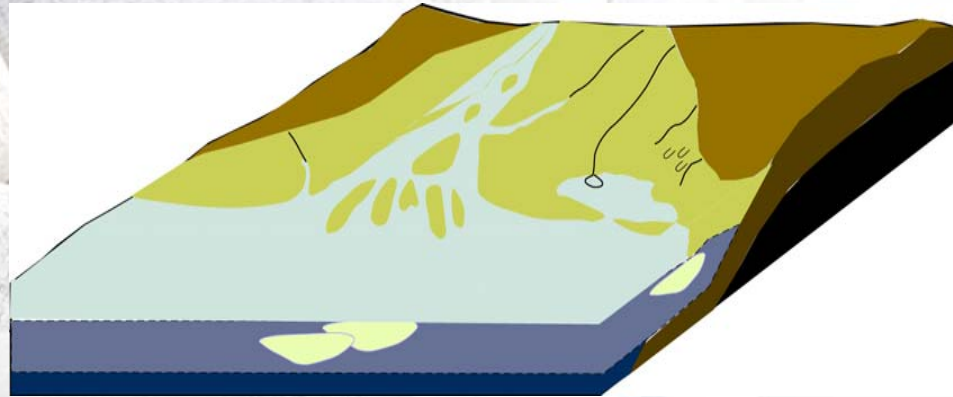


Bathymetric and topographic tints

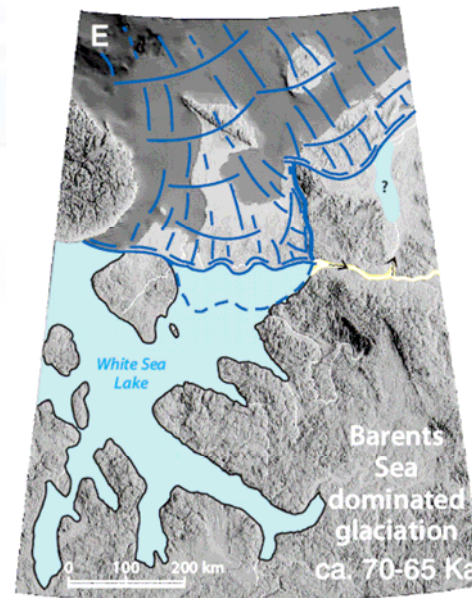


URL: <http://www.ngdc.noaa.gov/mgg/bathymetry/arctic/arctic.html>

Rivers adjust their geometry and aggrade/ degrade according to changes in relative sea level



Or lake level....

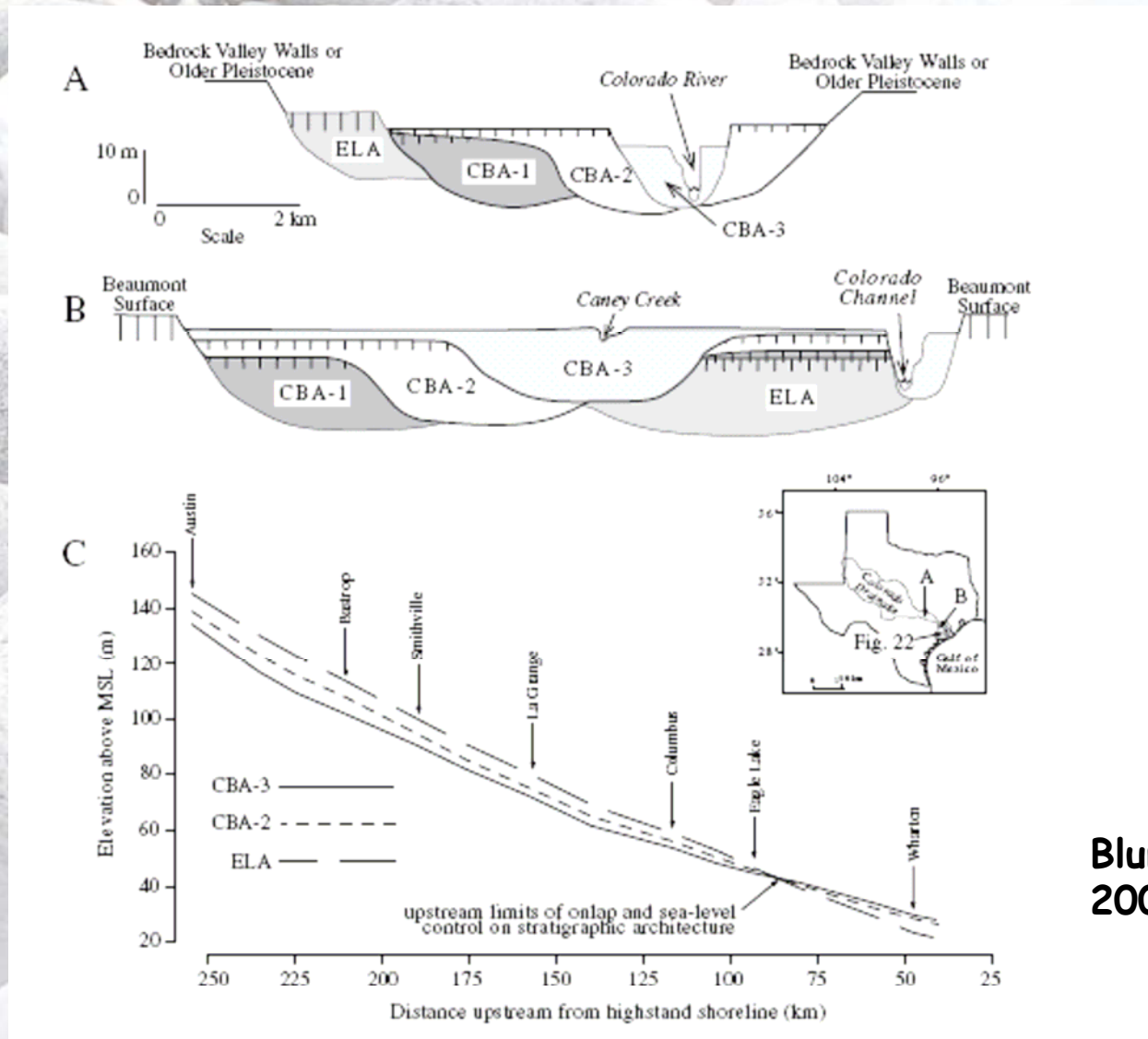




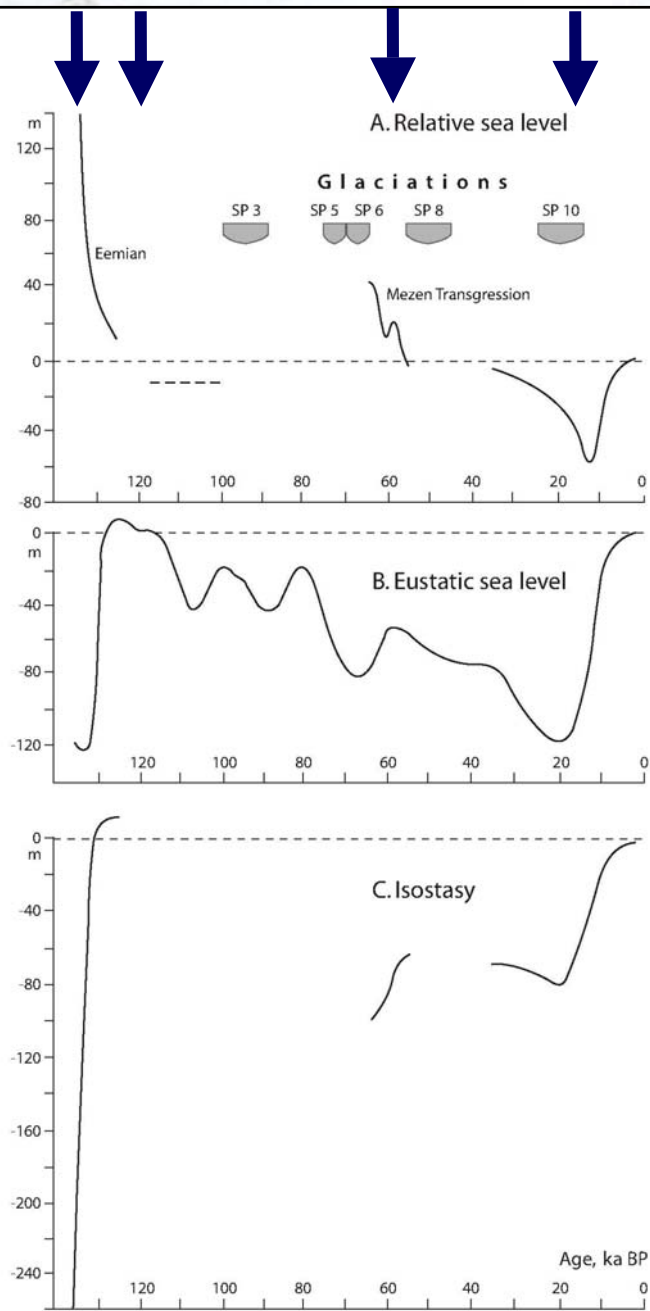
But also according to change in climate...



# Stacking pattern - response to climate or sea level



Blum & Törnquist  
2000



Larsen et al 2006

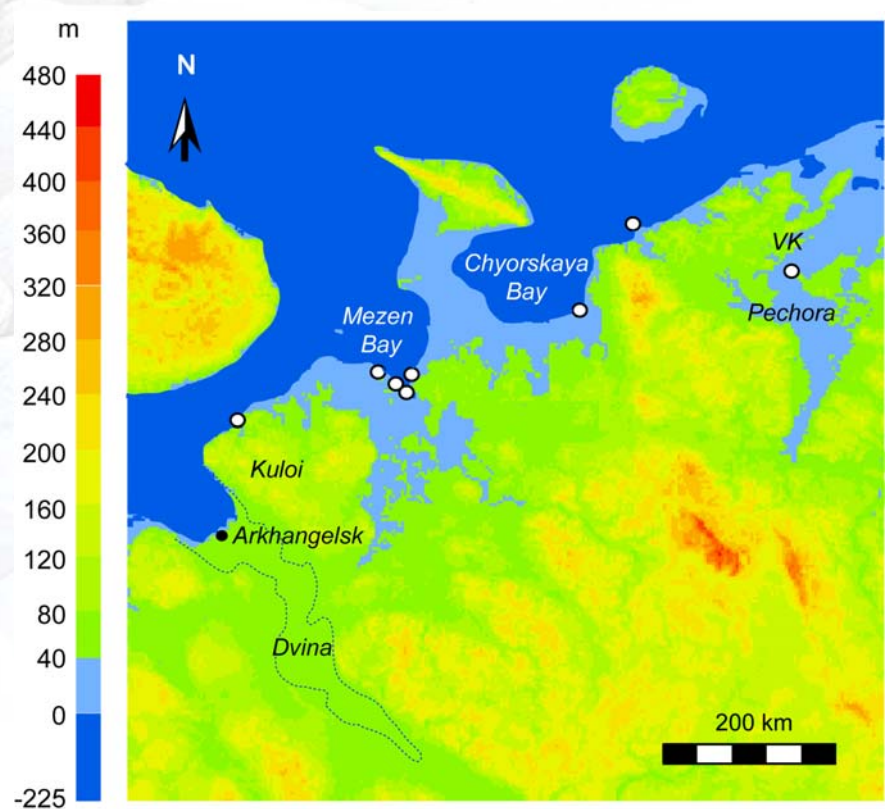
# Sea level fluctuations

Eemian highstand (130 ka BP)



(Funder et al. 2002)

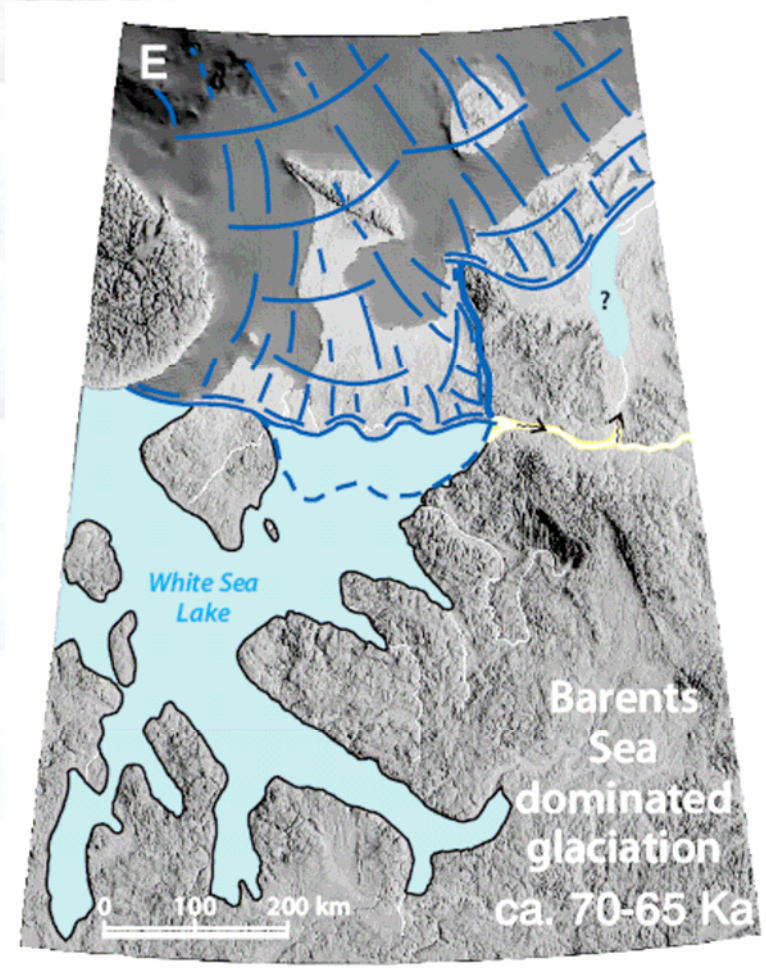
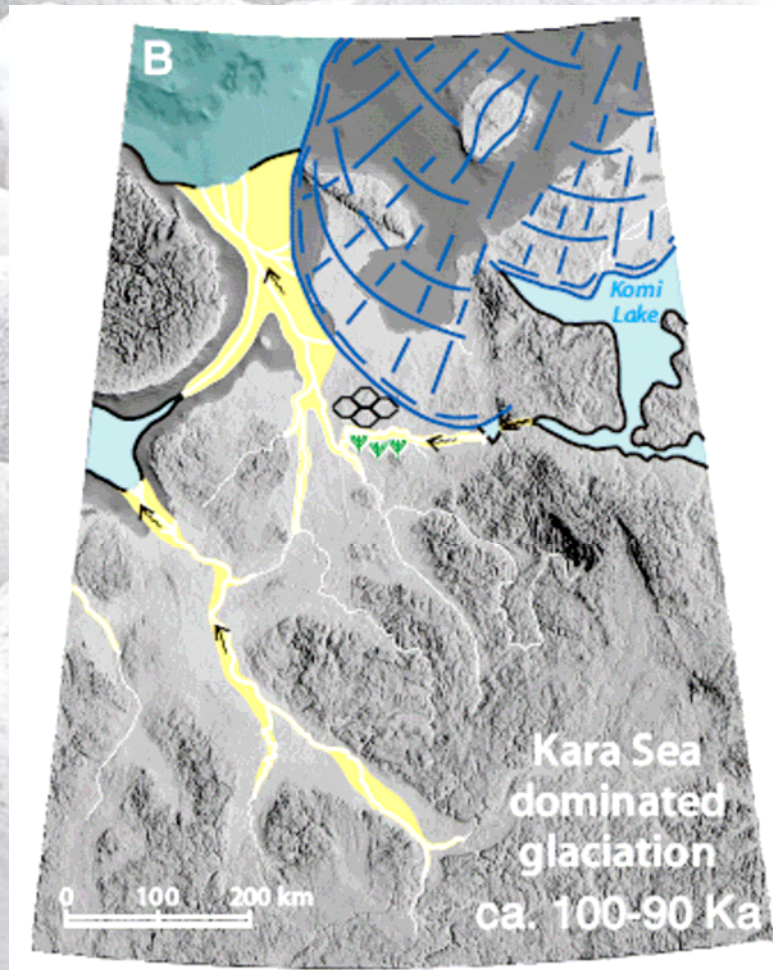
Weichselian highstand (60 ka BP)



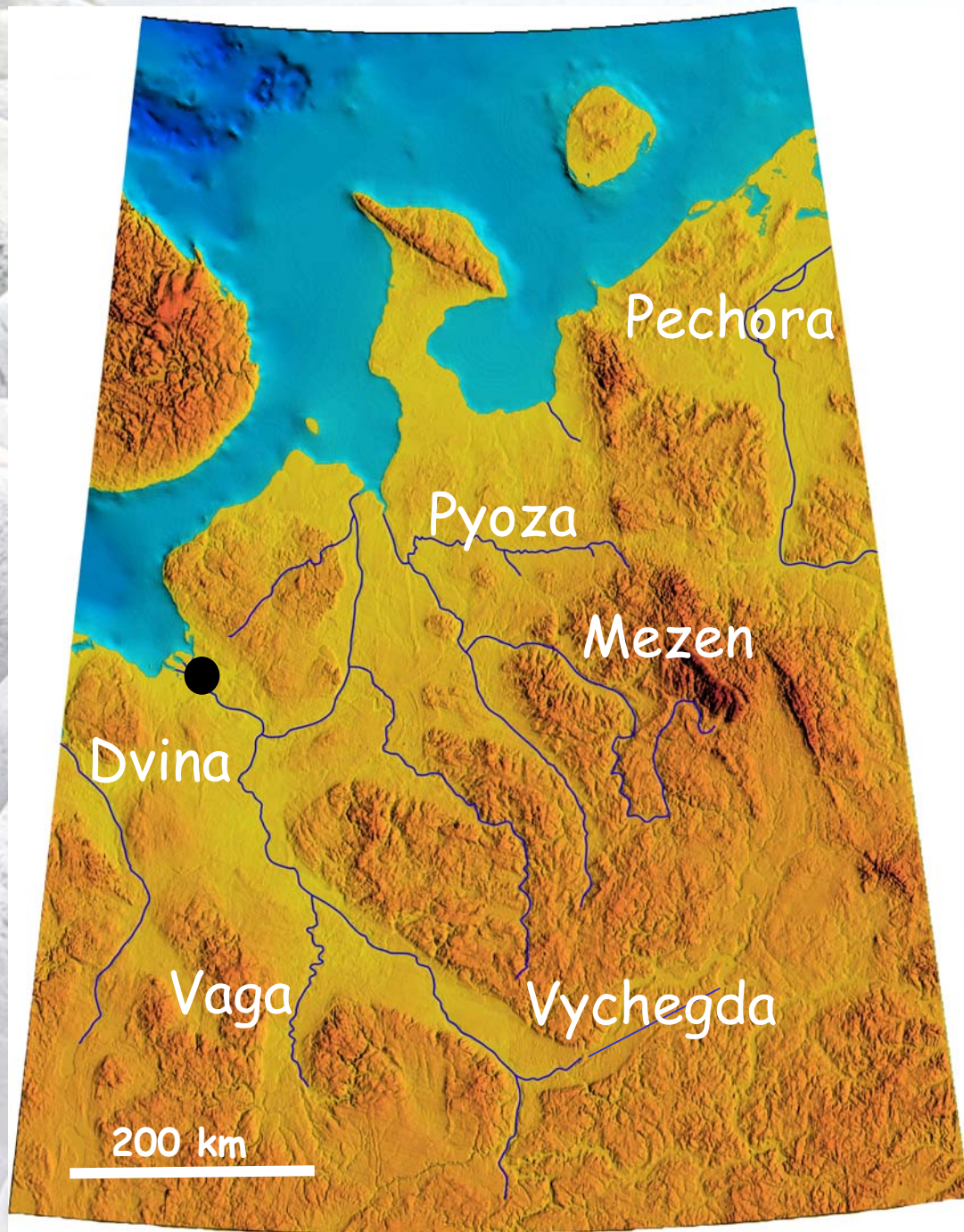
(Jensen et al. 2006)



# Importance of ice dammed lakes?







Previous studies:  
Lower Dvina - Vaga  
Pyoza  
Mezen

Fieldwork summer  
2006

Upper Dvina -  
Vycheгда

# Study area - multistorey fluvial deposits

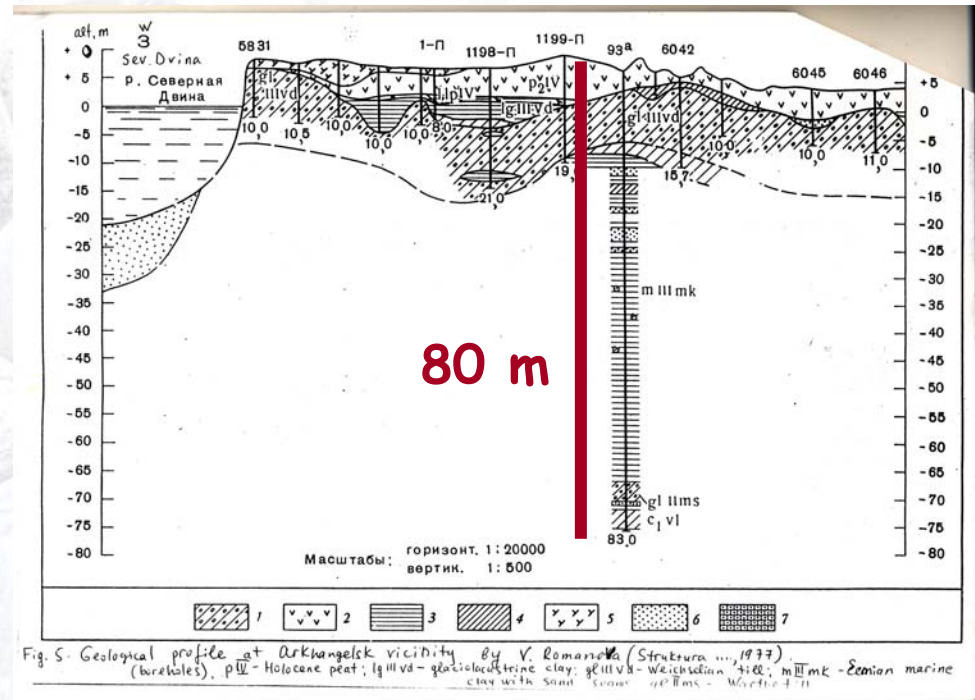
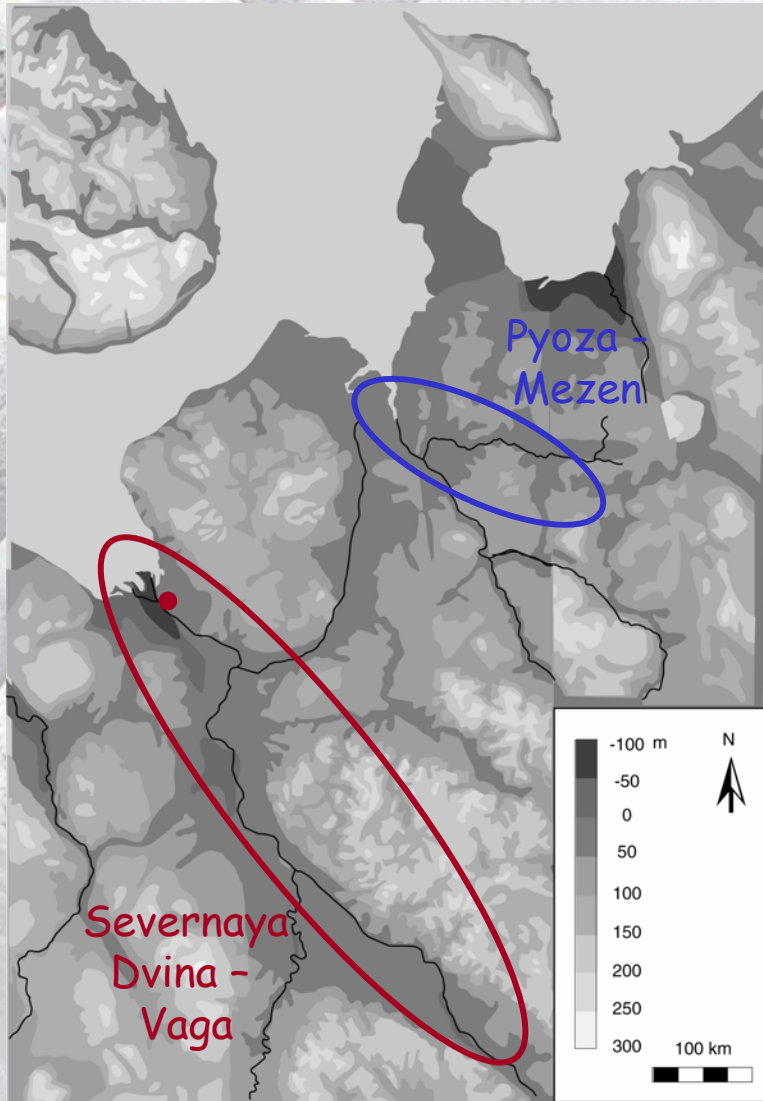
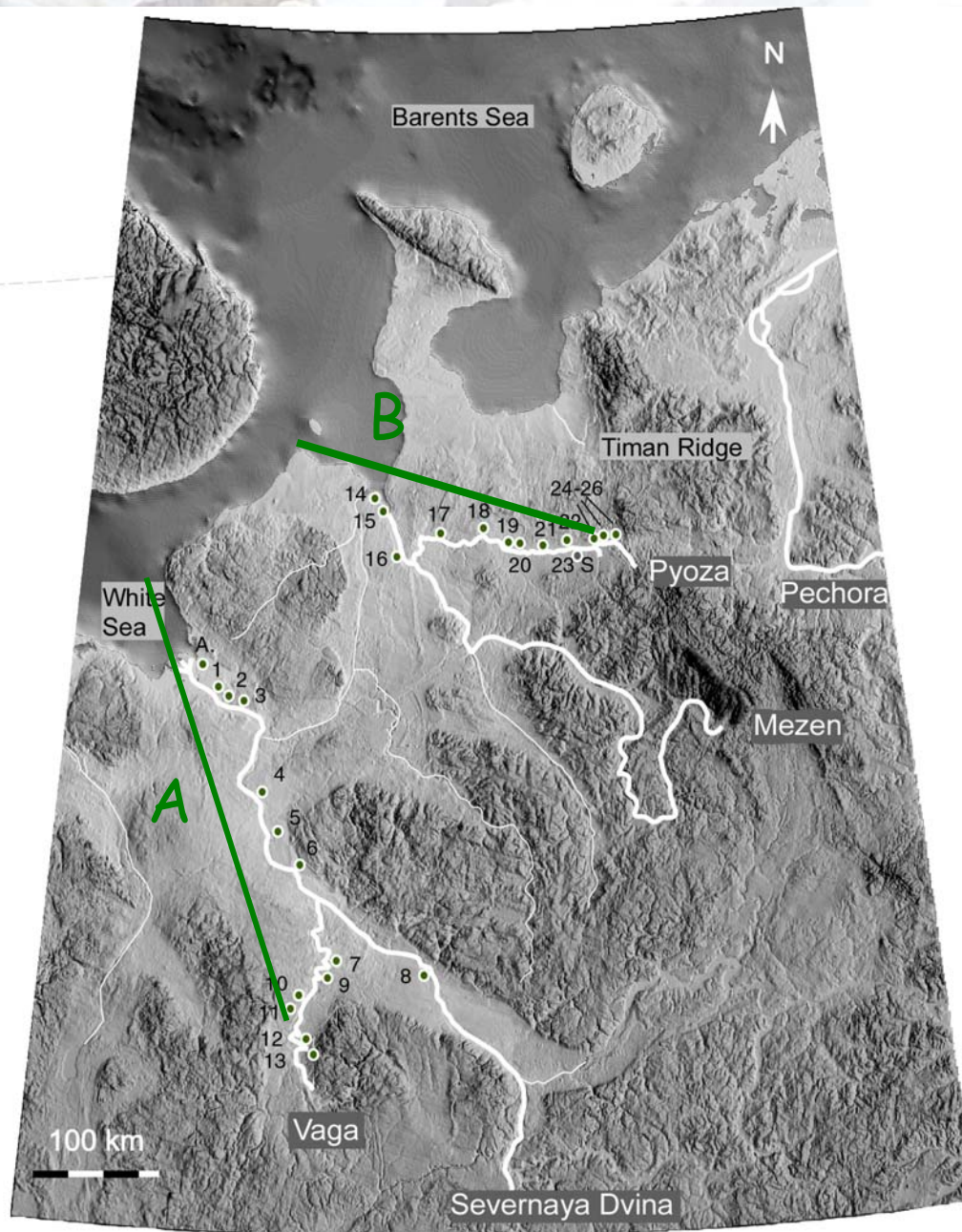


Fig. 5. Geological profile at Arkhangelsk vicinity. By V. Romanova (Struktura..., 1977).  
 (boreholes), p<sup>II</sup> - Holocene peat; lg<sup>III</sup>vd - glaciolacustrine clay; gl<sup>II</sup>vd - Weichselian till; m<sup>III</sup>mk - Eemian marine clay with sand; gl<sup>I</sup>lms - Weichselian till.

(Chebotaryova 1977)

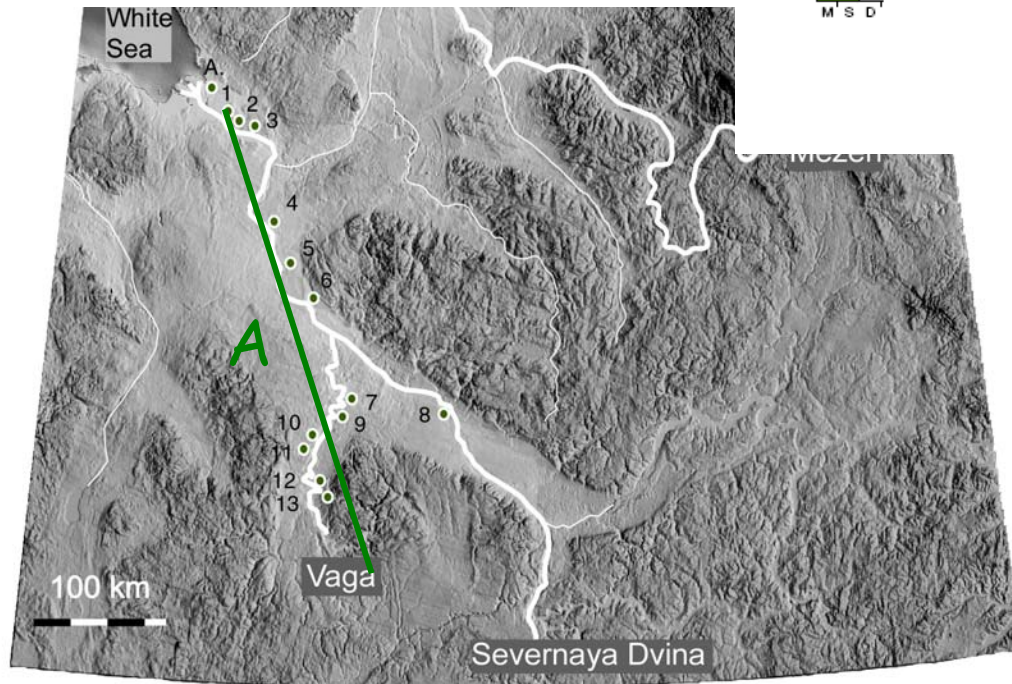
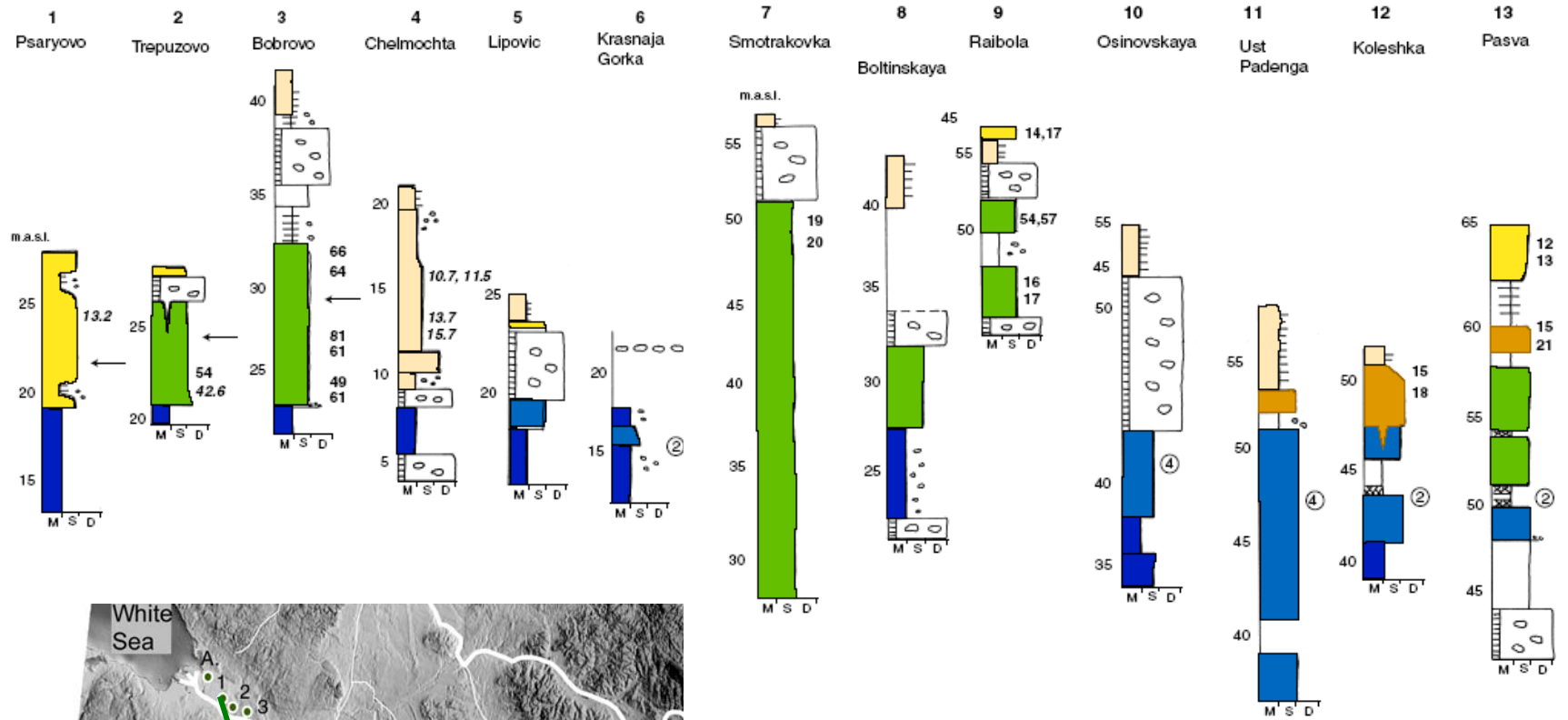


# DATA



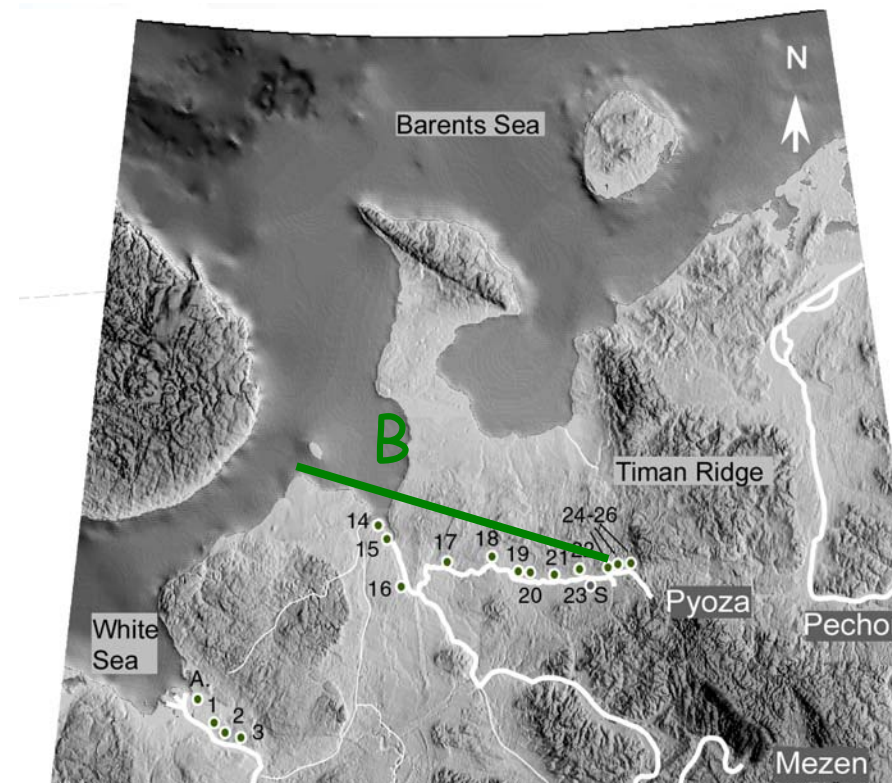
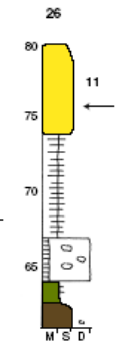
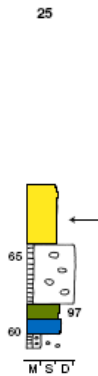
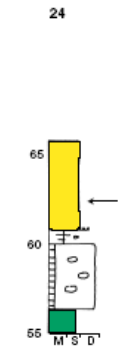
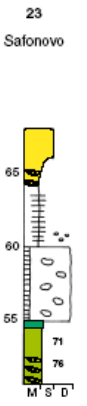
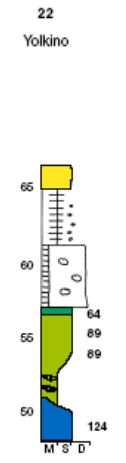
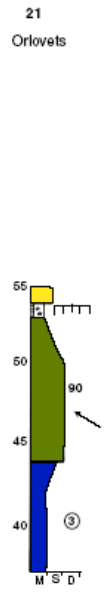
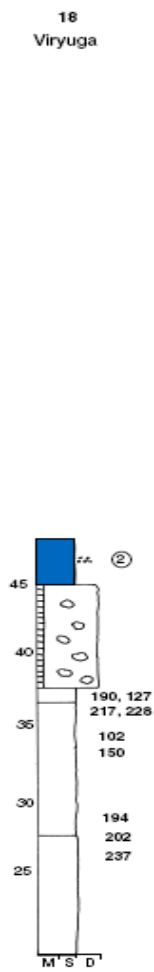
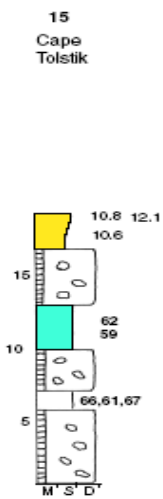
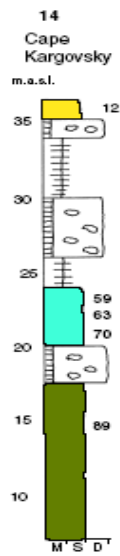
NW

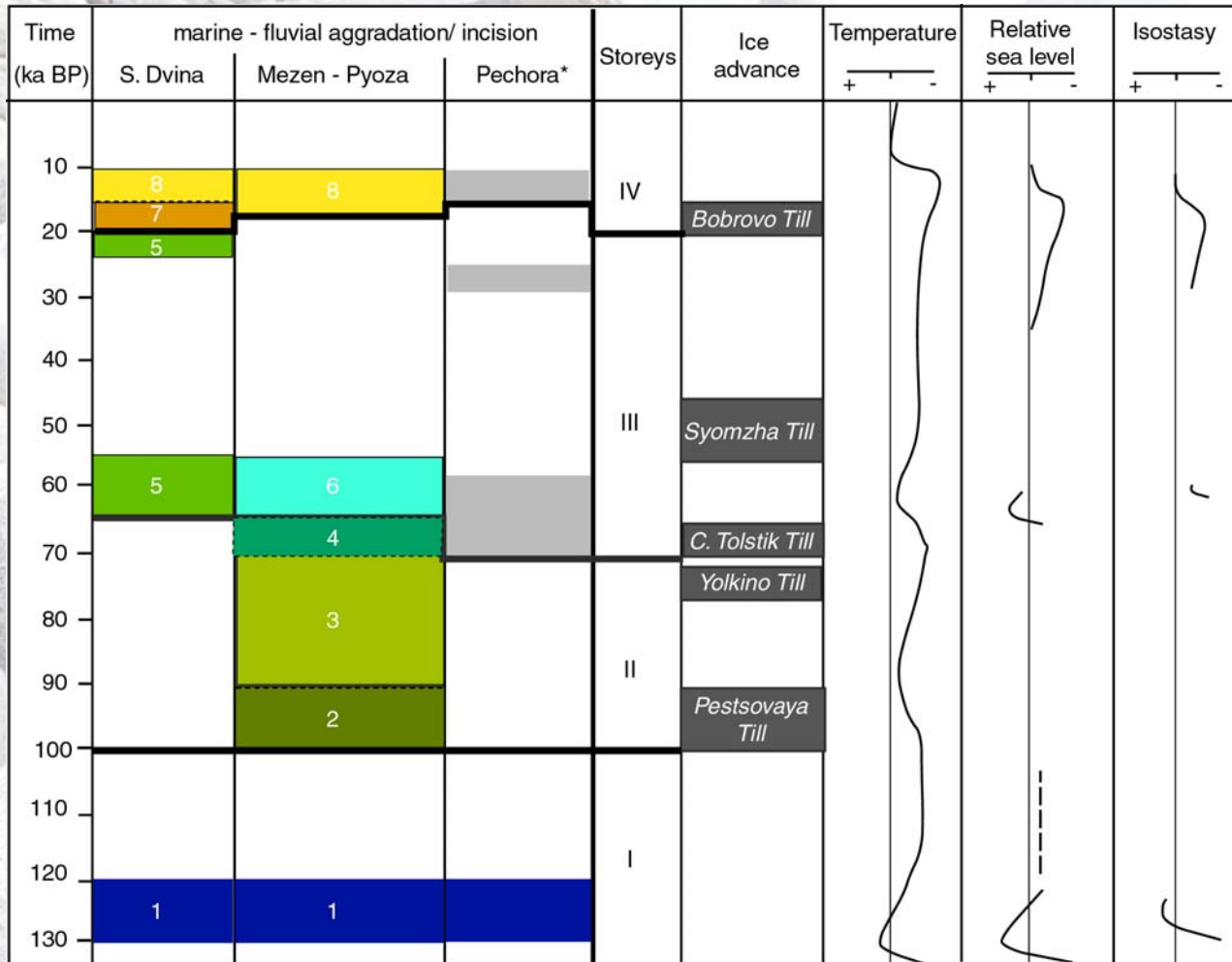
SE/ S





WNW





Regional aggradation

1 - 8: Unit numbers

Local aggradation

I - IV: Storey numbers

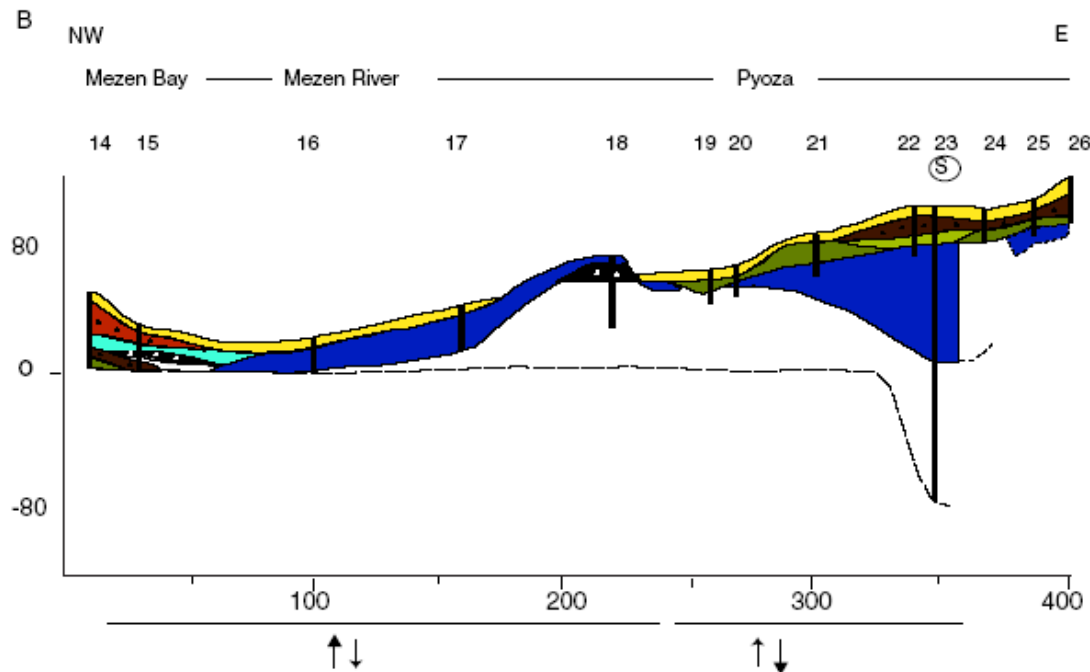
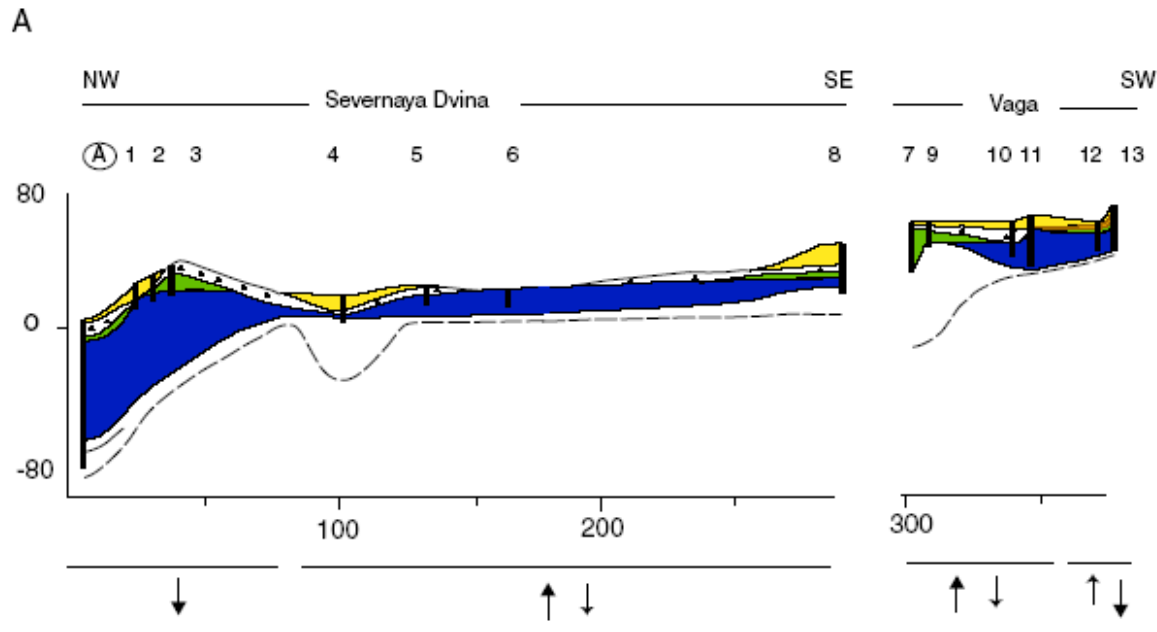
Regional fluvial incision

\* Data from Maslenikova *et al.* (2002)

Local fluvial erosion



# Fluvial architecture and neotectonic movements



## Conclusions..... So far

The fluvial sedimentary record from the Arkhangelsk Region reflect a number of adjustments to variations in discharge and sediment supply, dramatic lake level changes and fluctuating sea level during the past interglacial - glacial cycle.

- Incision took place during cold phases in adjustment and may be driven by base level lowering due to breaking of ice dams.
- Aggradation is linked to increased sediment supply and rapid base level rise.
- The preserved fluvial geometry reflects the interplay between these parameters and the influence of neotectonic crustal movements.
- The effect of relative sea level change is surprisingly weak. Falling sea level is associated with forced regression and deposition of coastal deposits.