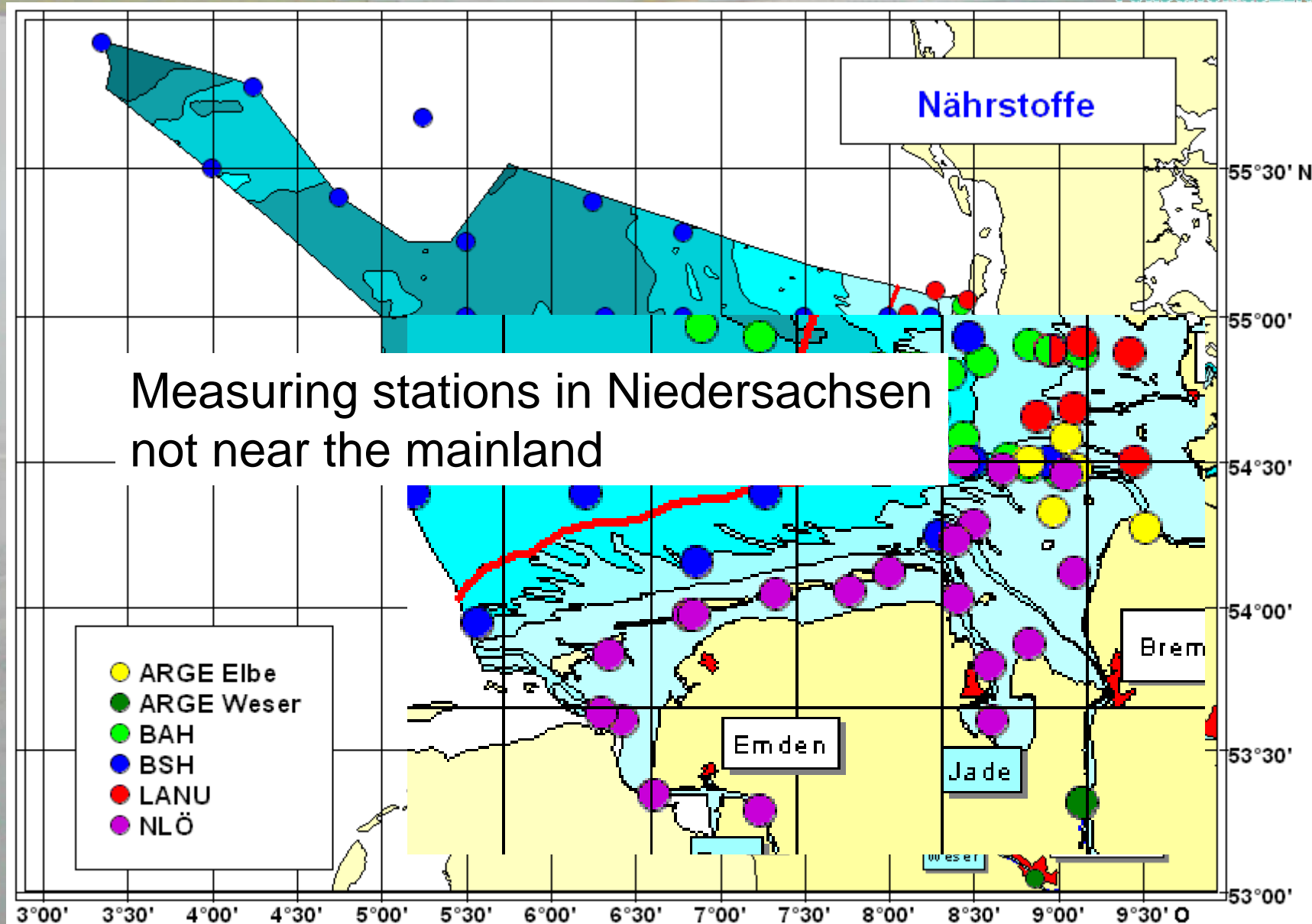


Nutrient gradients in the Wadden Sea

Götz Flöser, GKSS Research Centre

TMAP-Workshop, Hamburg, 29.11.2004

Monitoring in the North Sea



July 71

April 72

Nutrient budget? Philippart & Cadée, 2000

Wadden Sea prominent

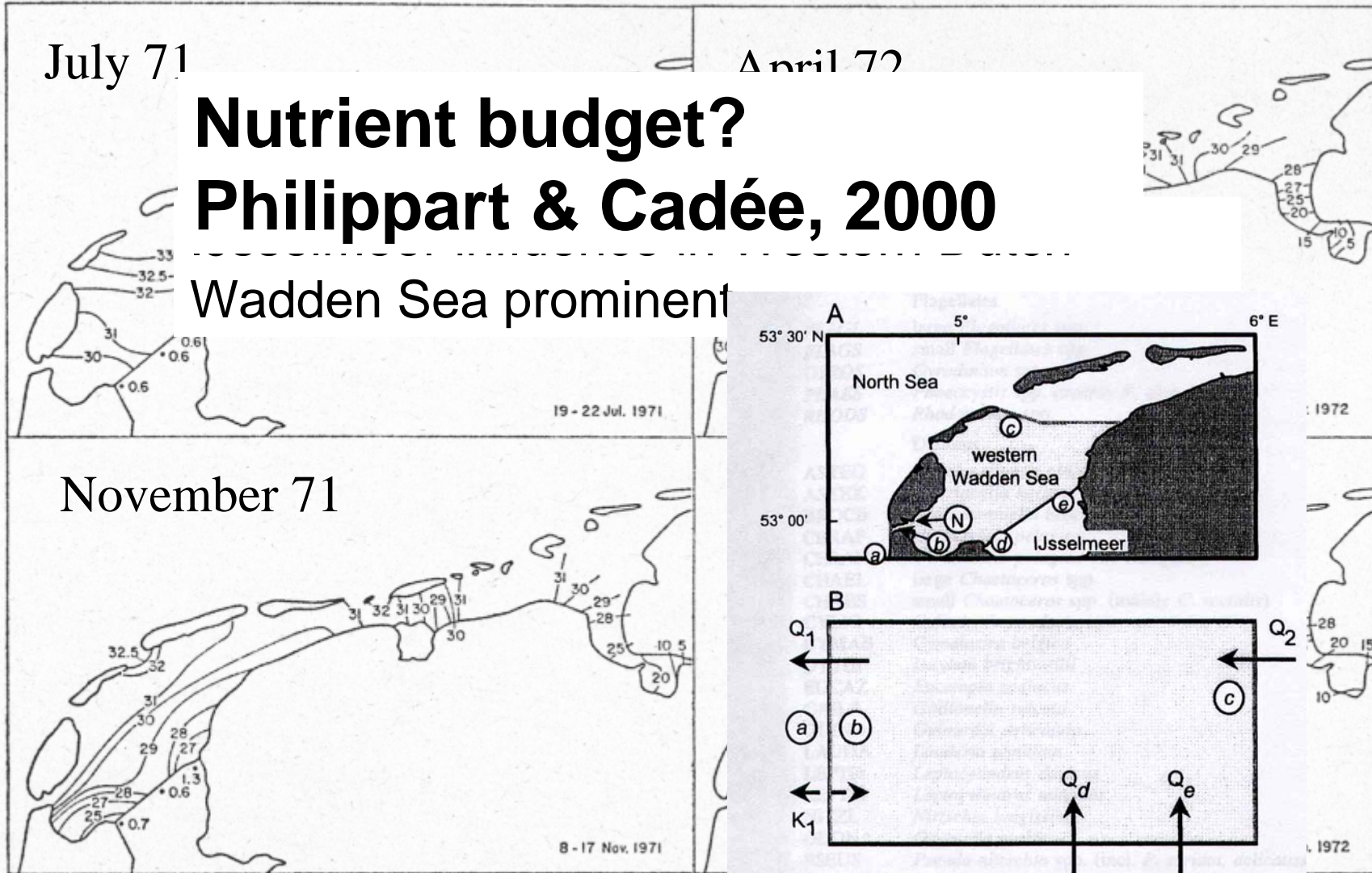
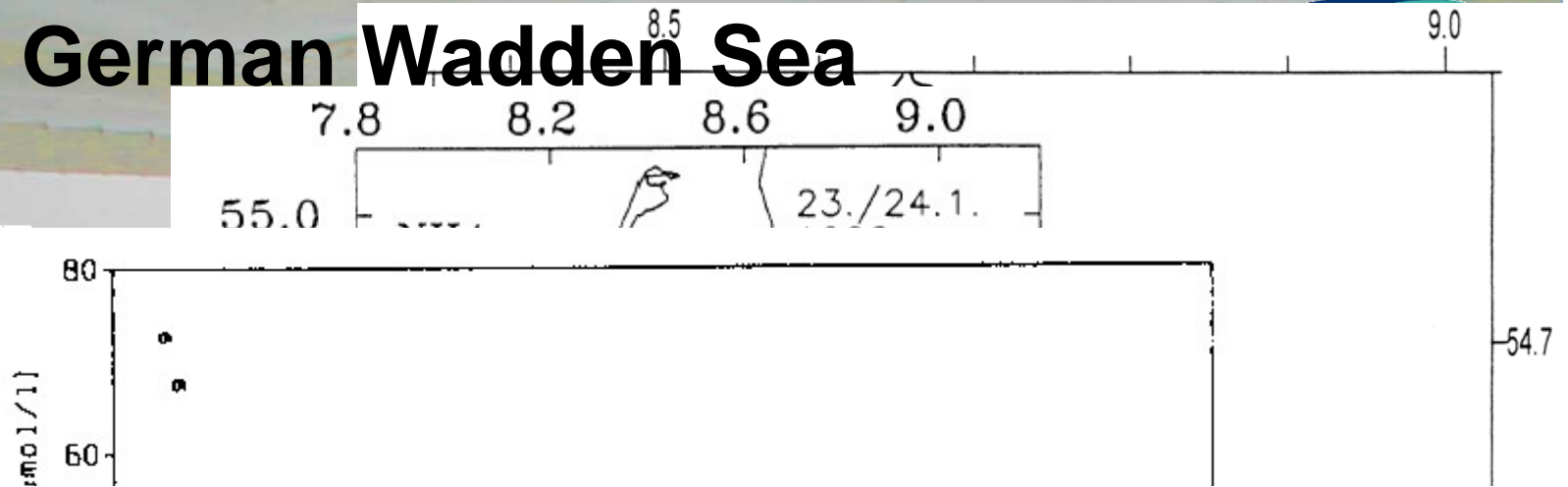


Fig. 2. Salinity distribution in the Dutch Wadden Sea, July 1971; April, June 1972; measurements in the IJsselmeer indicated by value.

North German Wadden Sea

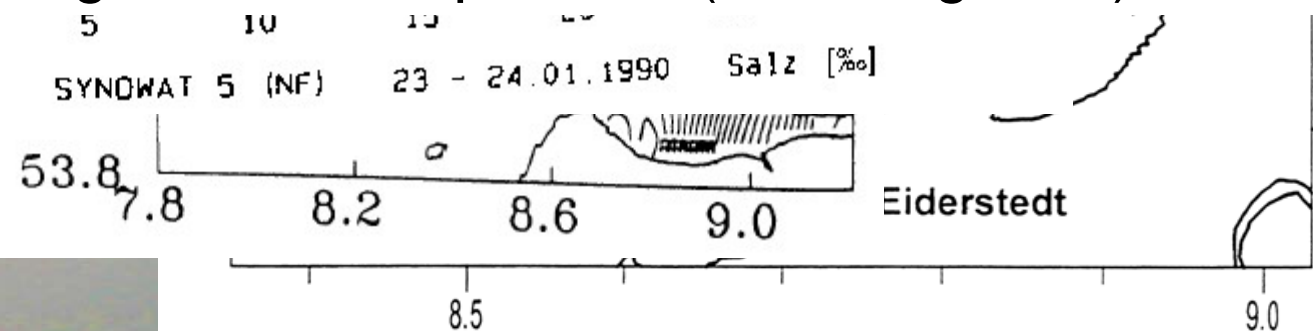
TRANSWA



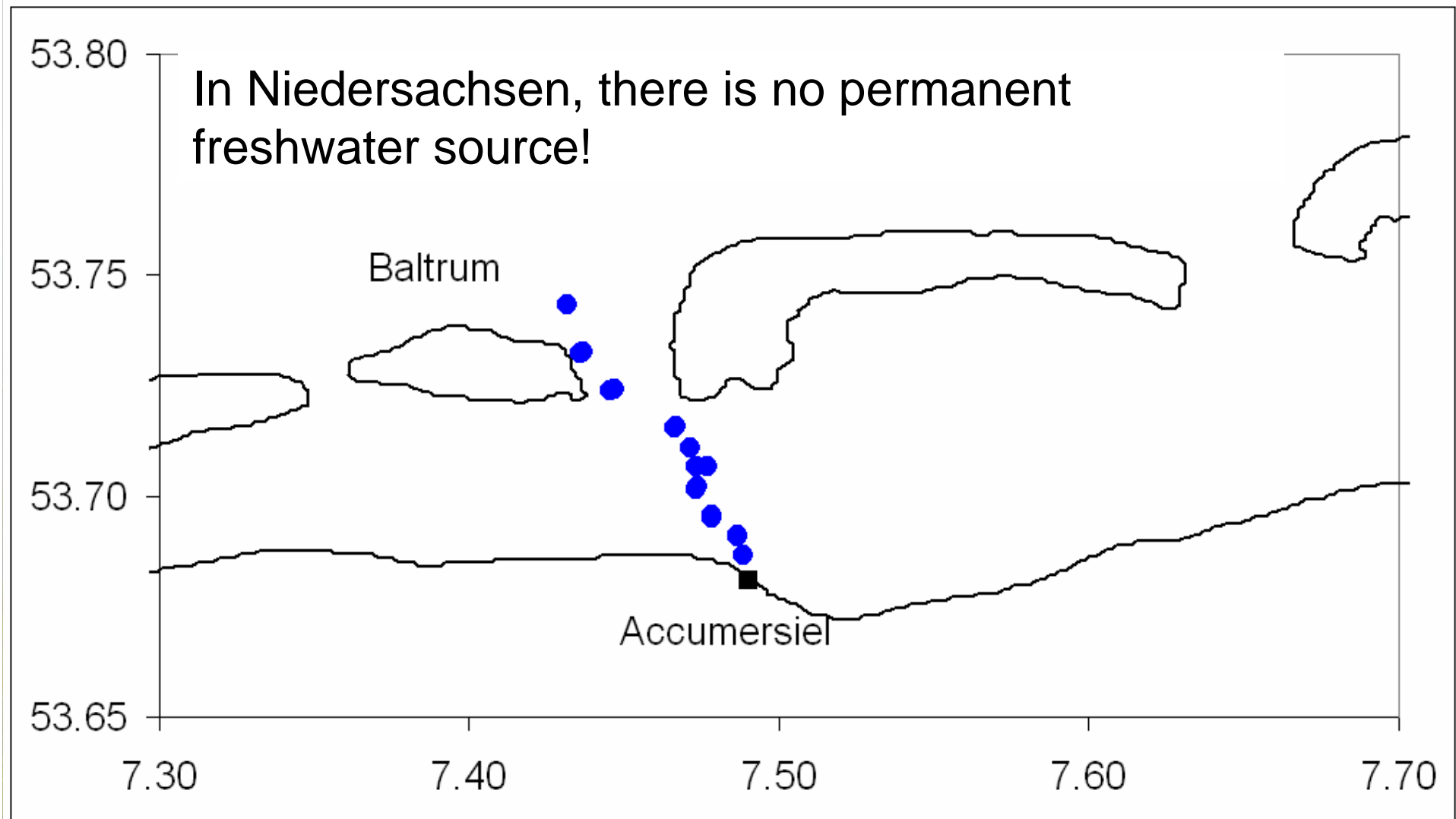
The gradients found in Schleswig-Holstein can be attributed to:

- 1) freshwater input from polders,
- 2) influence of the Elbe at westerly wind conditions

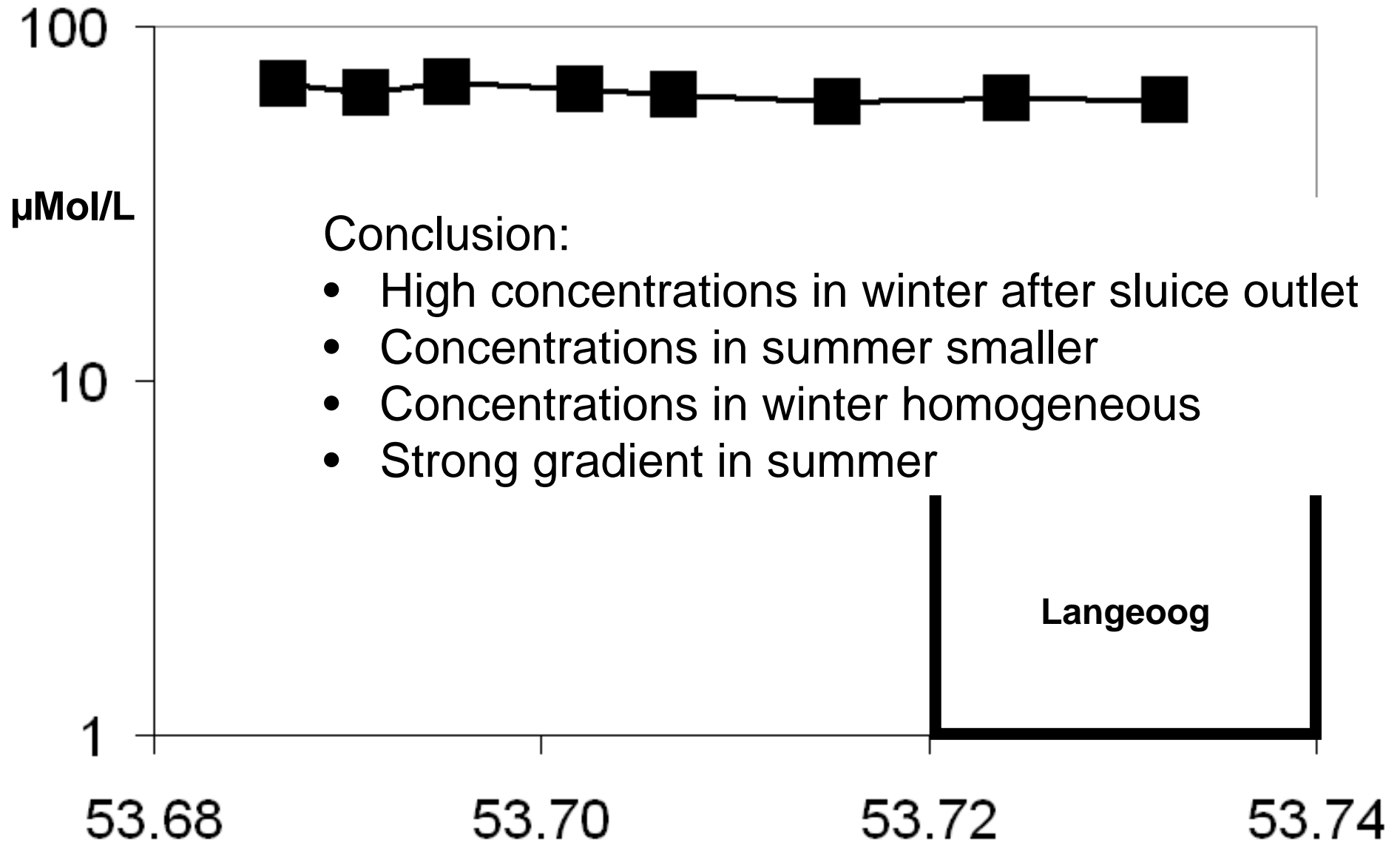
Generally, mixing is the main process (N-S-diagrams)



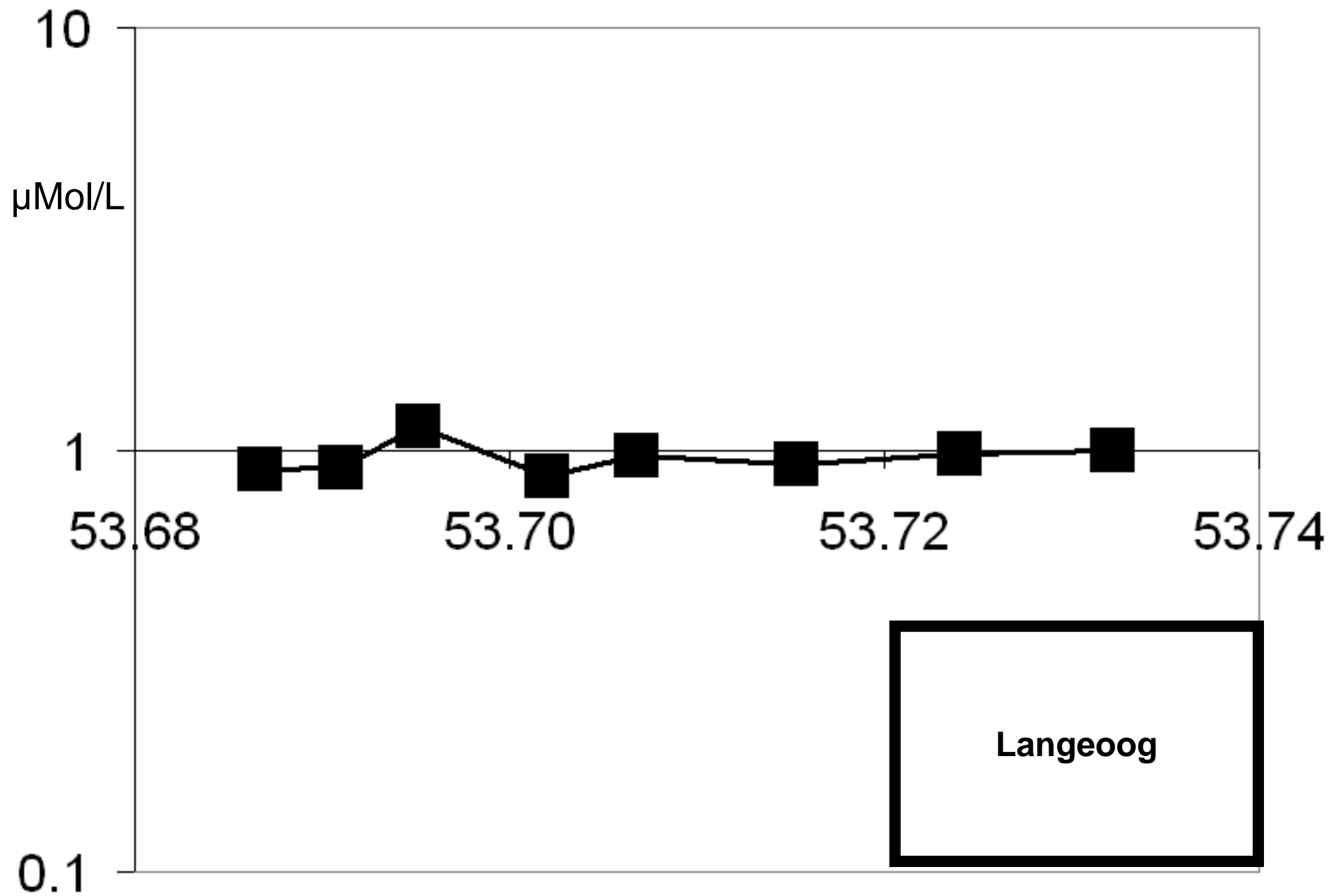
Cross-shore profiles in the Niedersachsen Wadden Sea



DIN 27.01.03

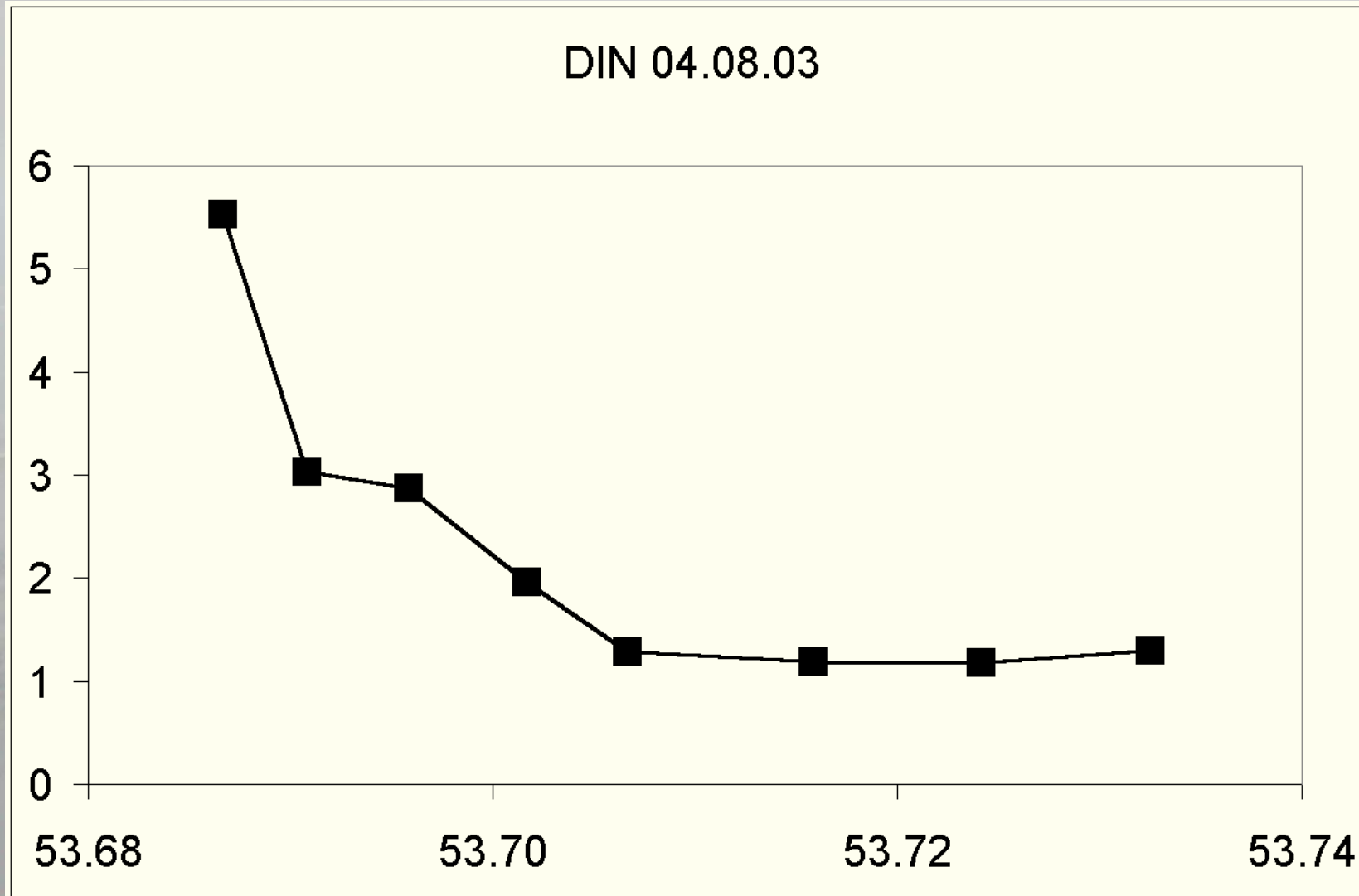


DIP 27.01.03

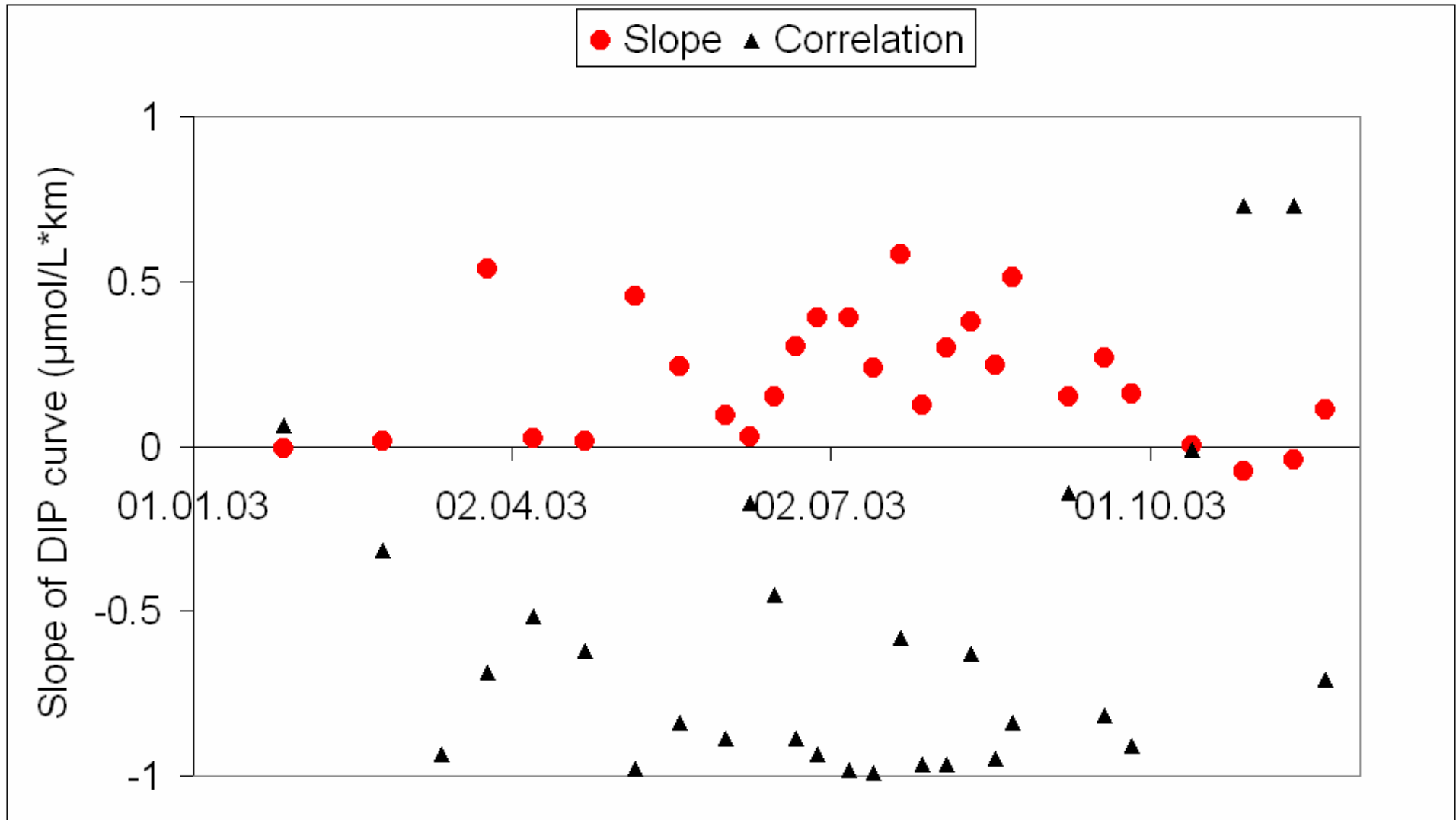


Linear y-axis ($\mu\text{mol N/L}$)

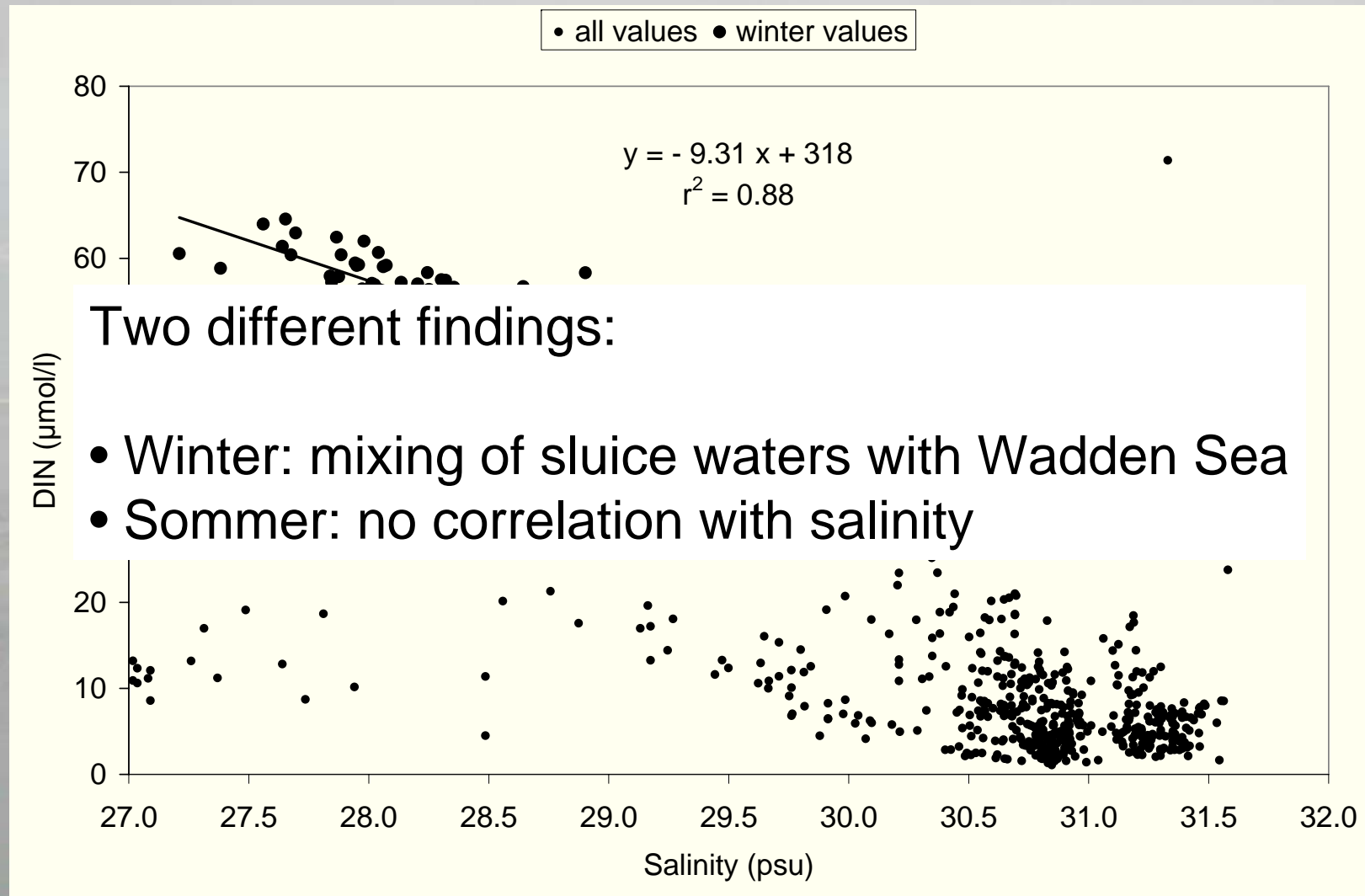
DIN 04.08.03



Slope of DIP-curves



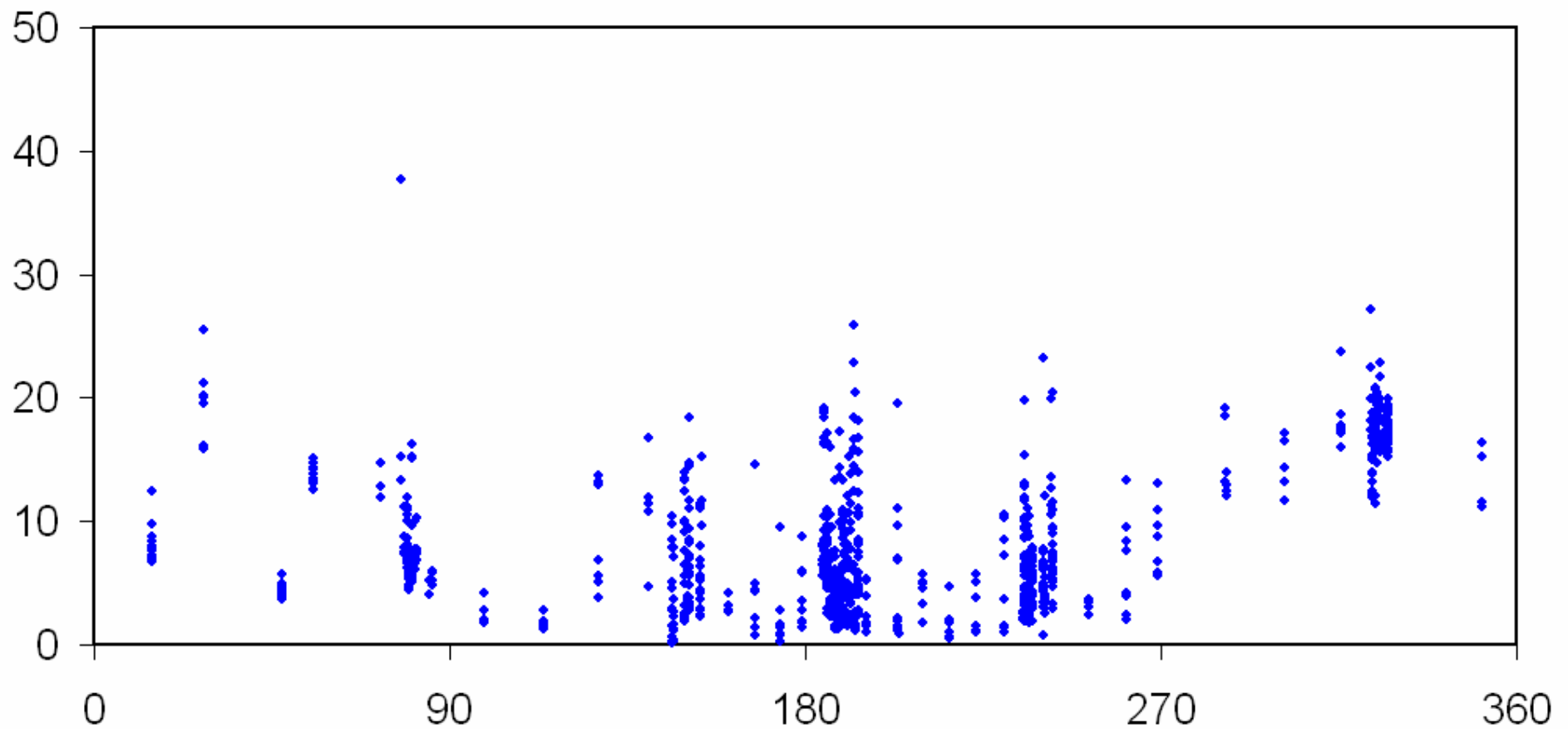
Nutrient measurements in the Wadden Sea: Correlation with salinity



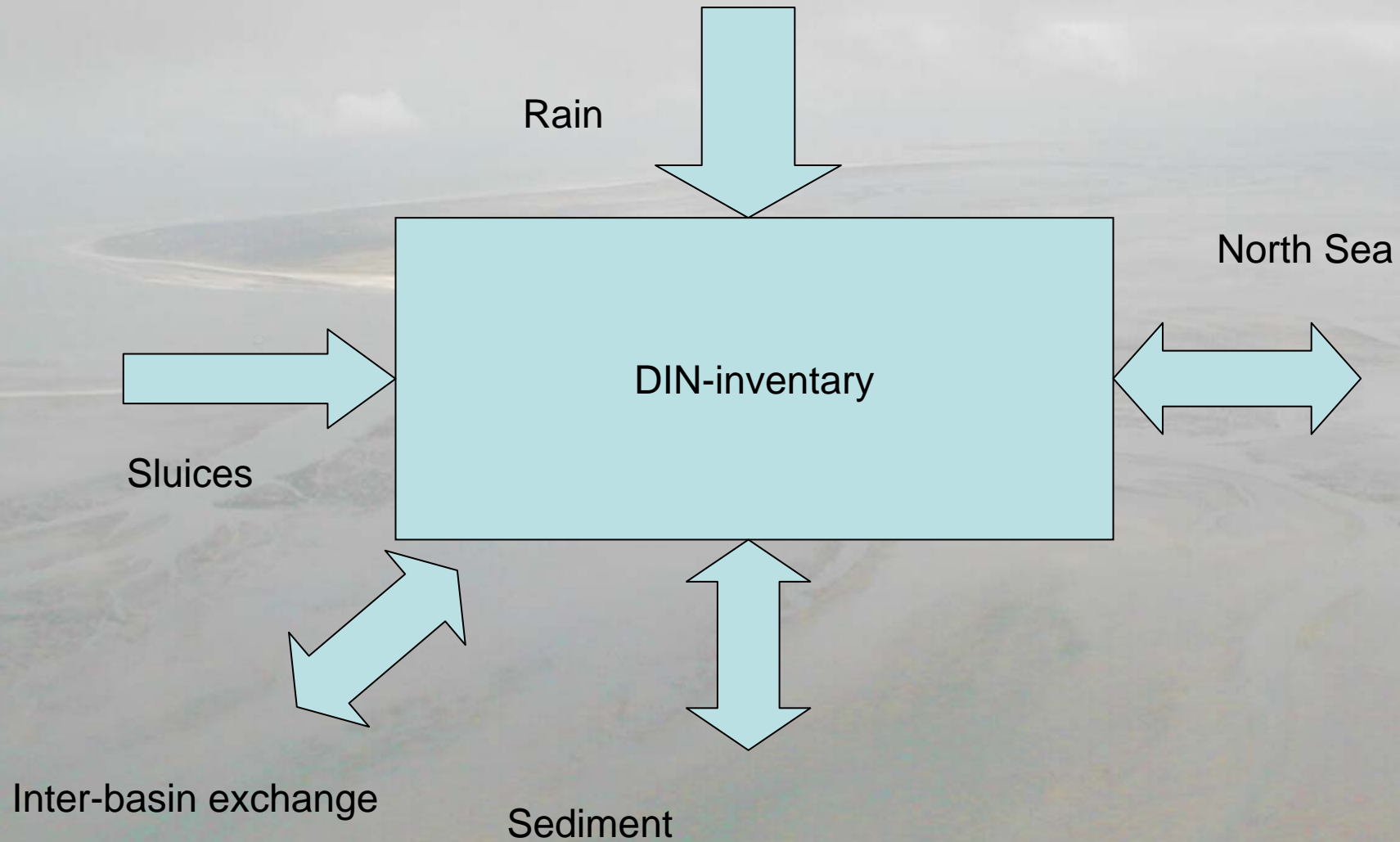
Consequence: winter concentrations of NH_4+NO_2 double the values near the islands



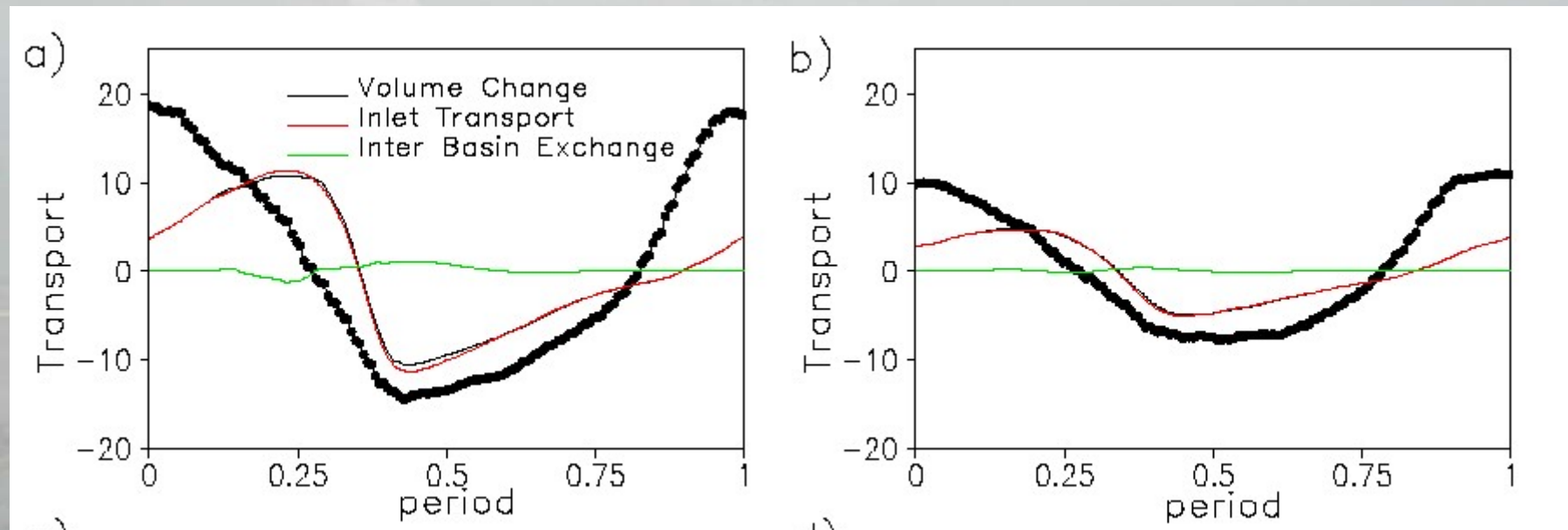
NH_4+NO_2 2000-2003



Nutrient budget: summer

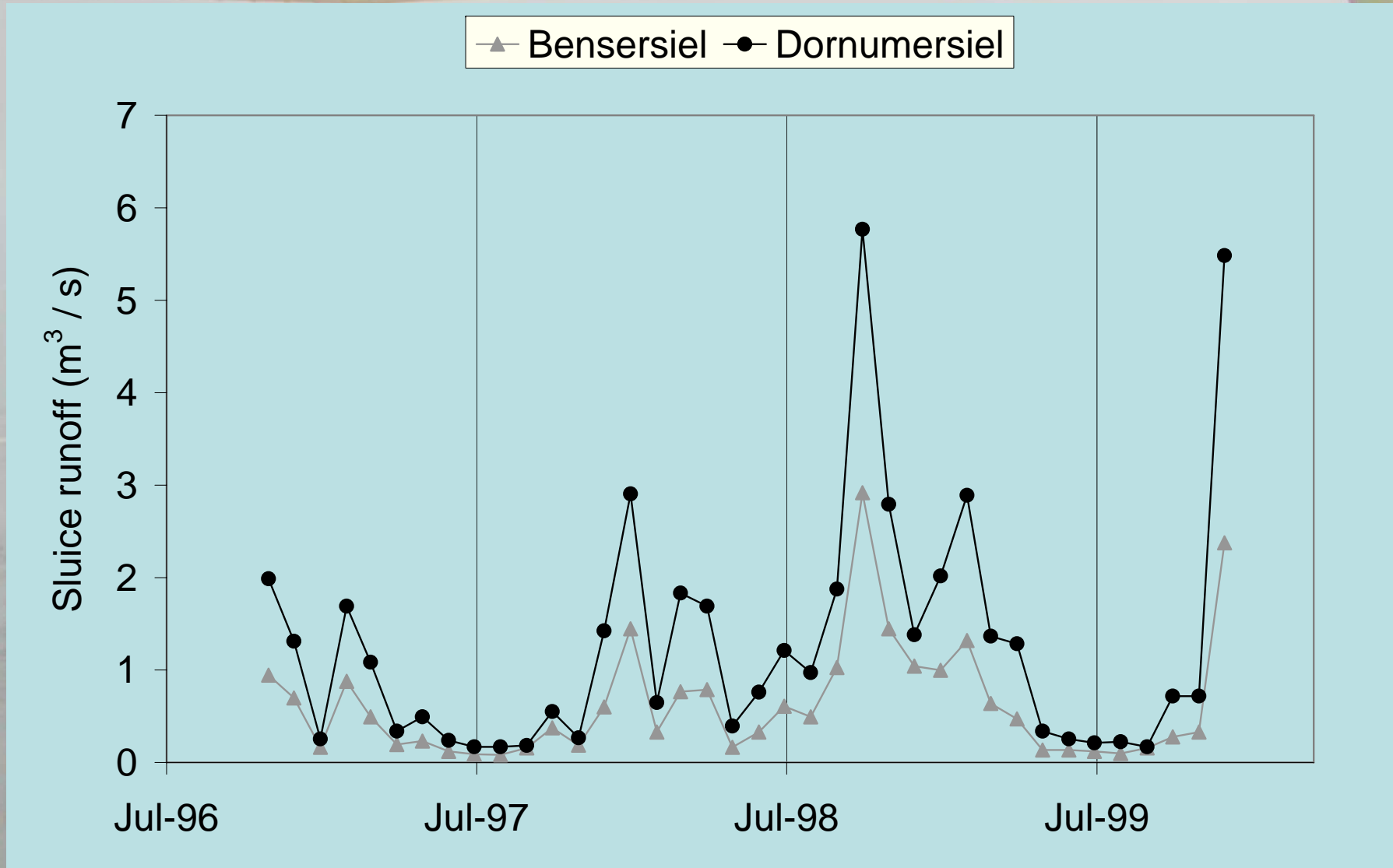


Nutrient budget: inter-basin exchange is small

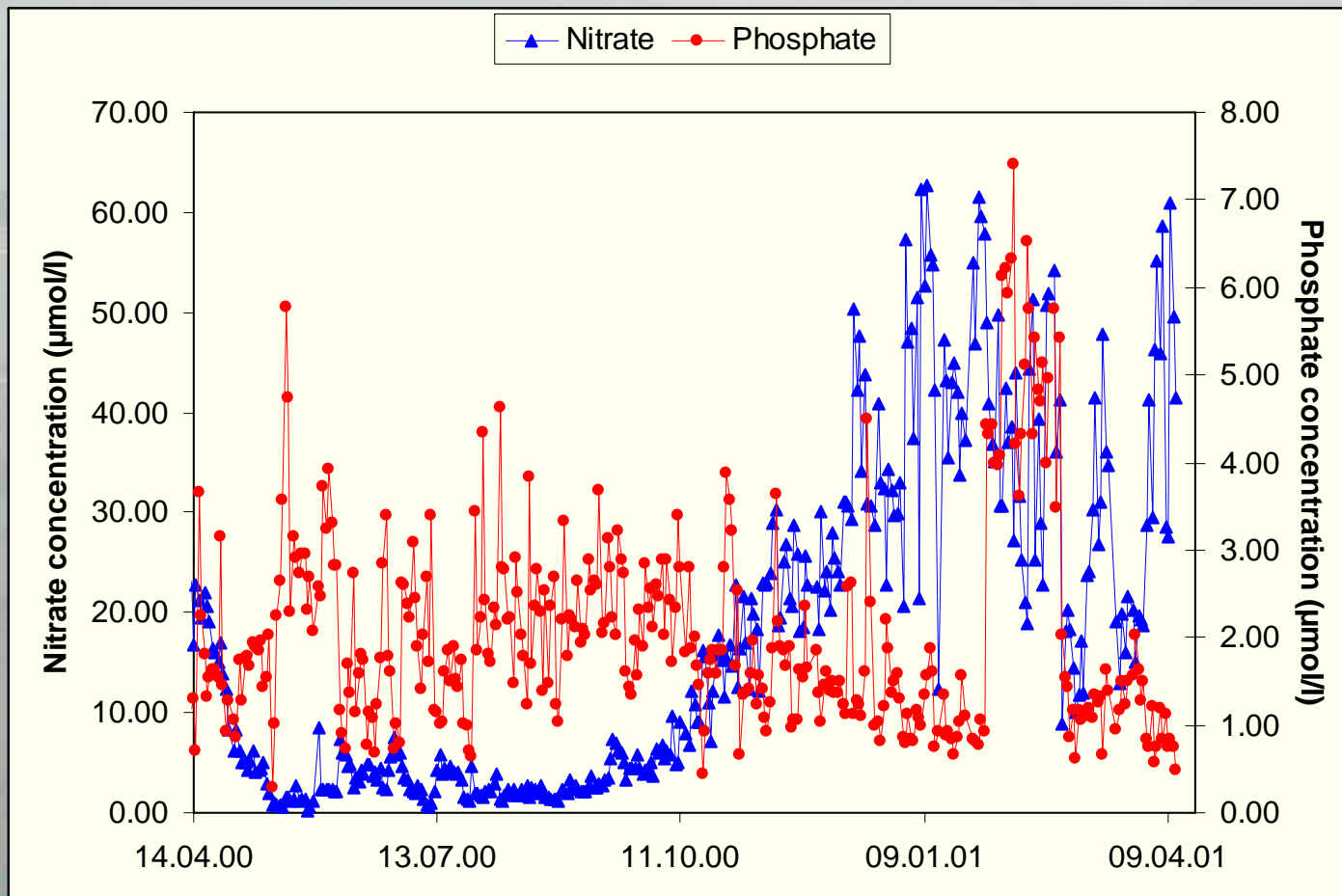


Stanev et al., 2003

Sluices: Variability of runoff

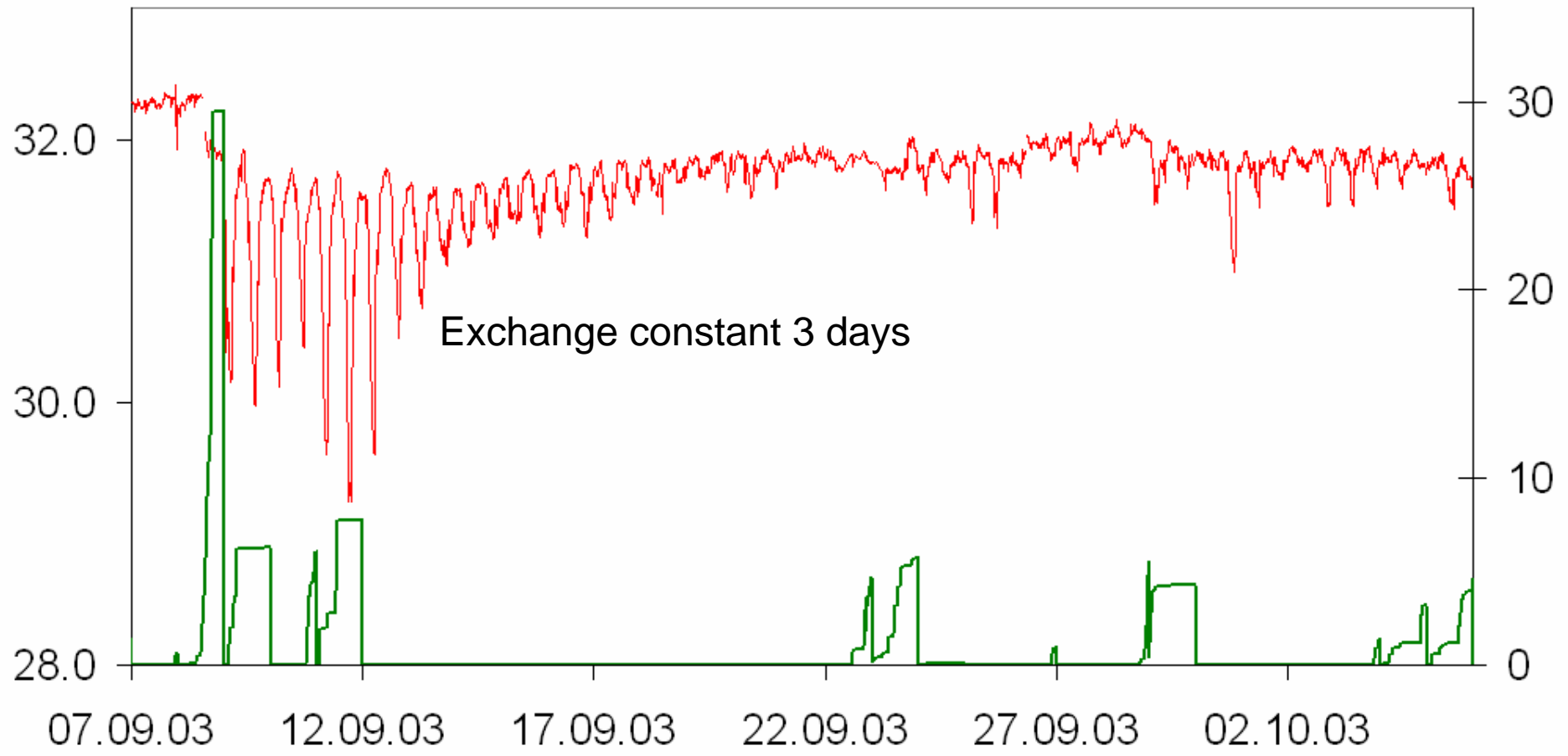


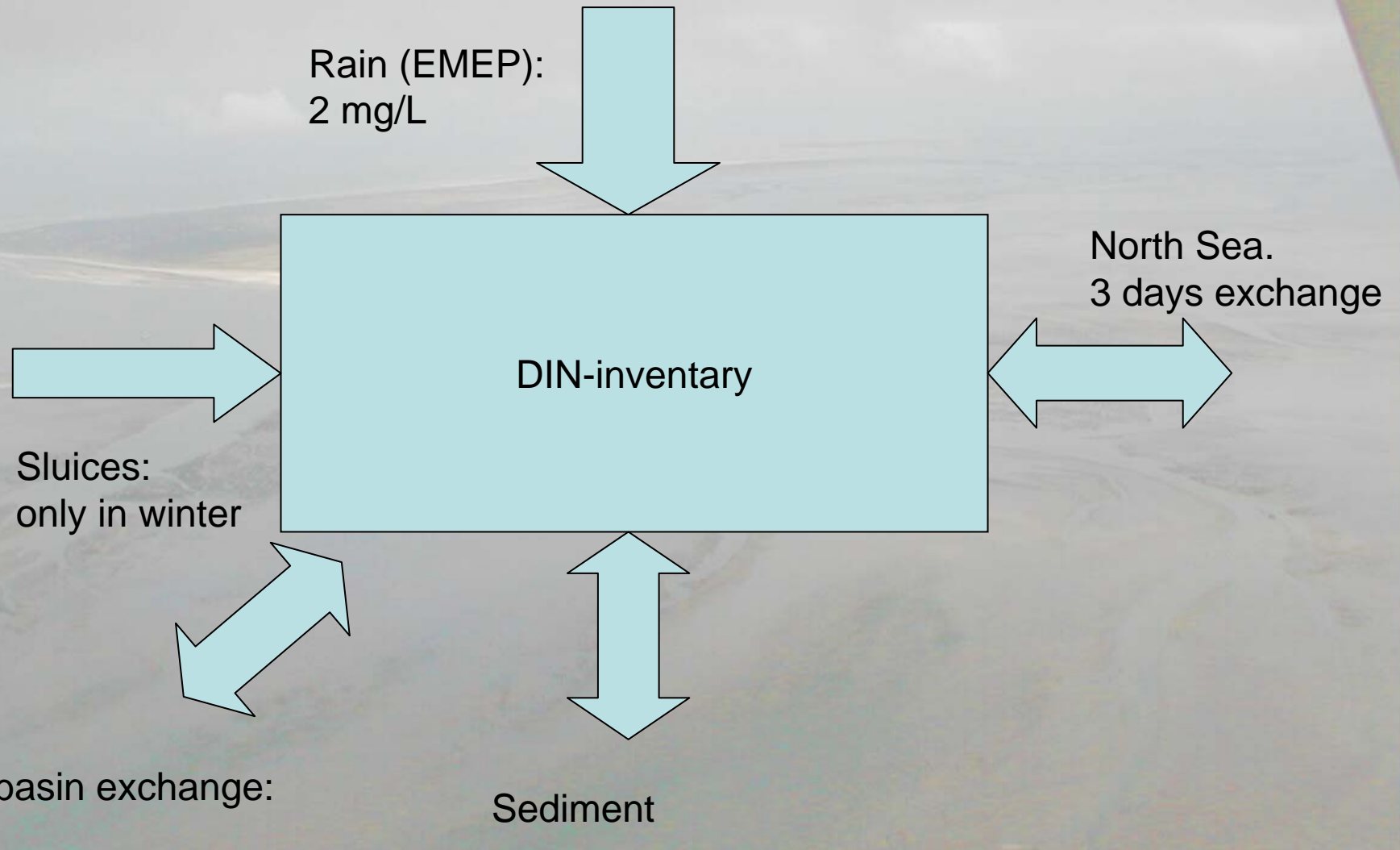
Sluices: nutrient concentrations



Exchange with North Sea: Time constant

— Salinity Ee — Niederschlag_Tag

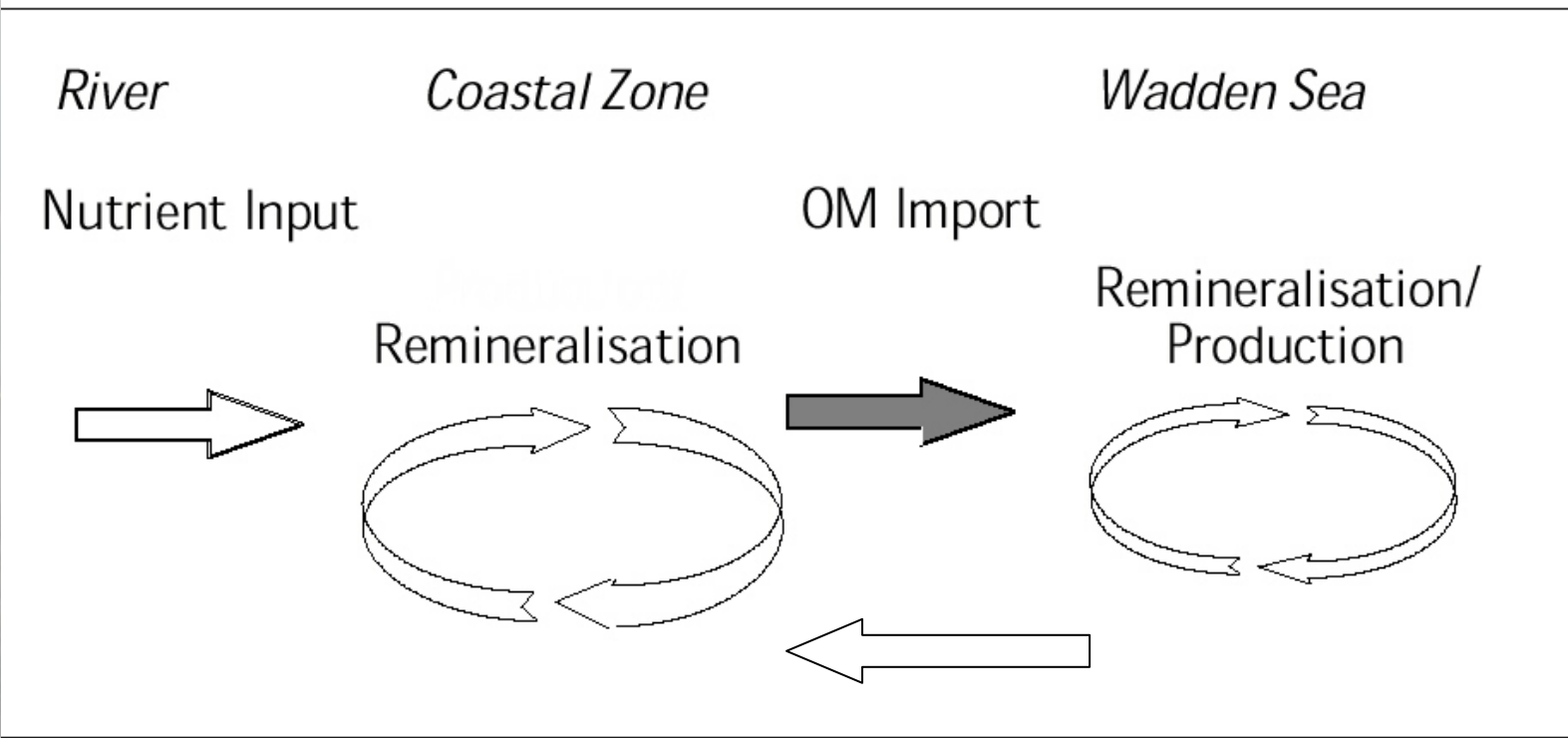




Inter-basin exchange:
small

Sediment

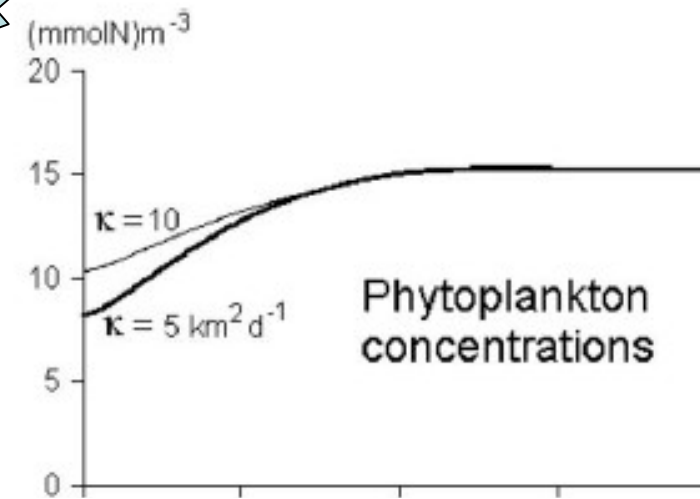
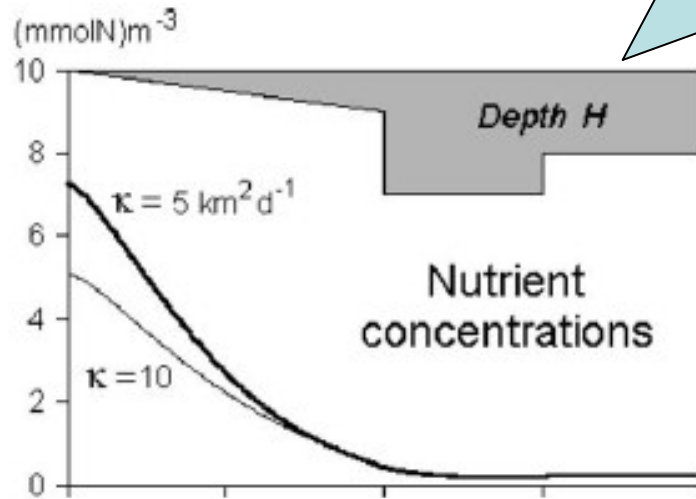
Conceptual model for nutrient dynamics:



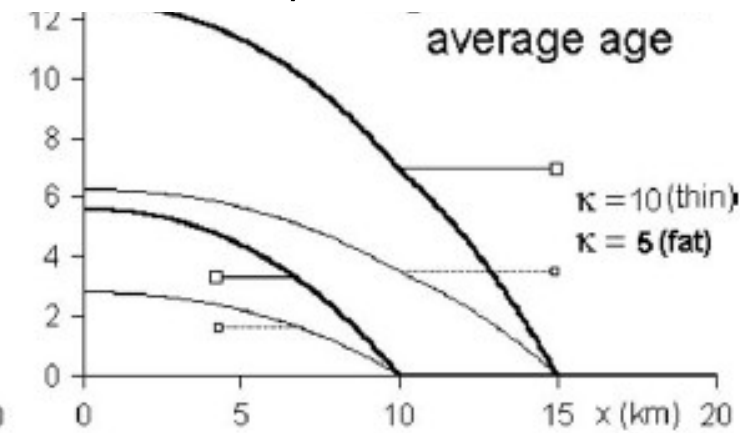
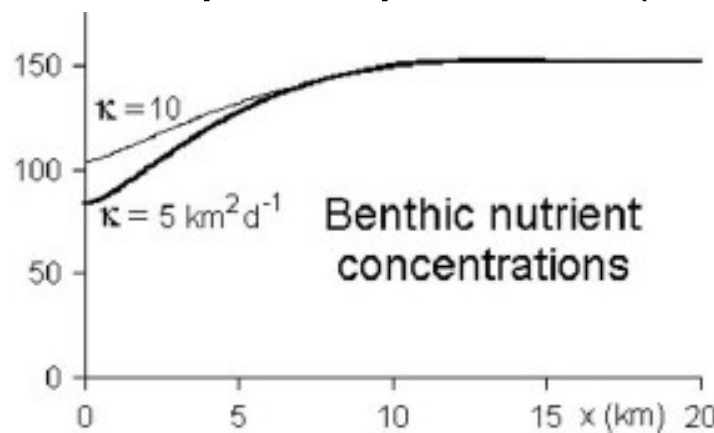
Export of dissolved nutrients

Theoretical profiles:

depth function



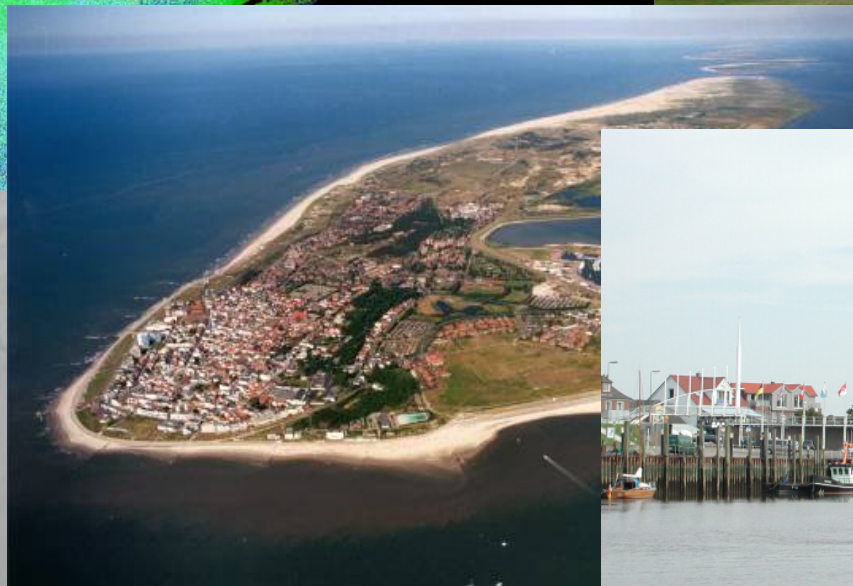
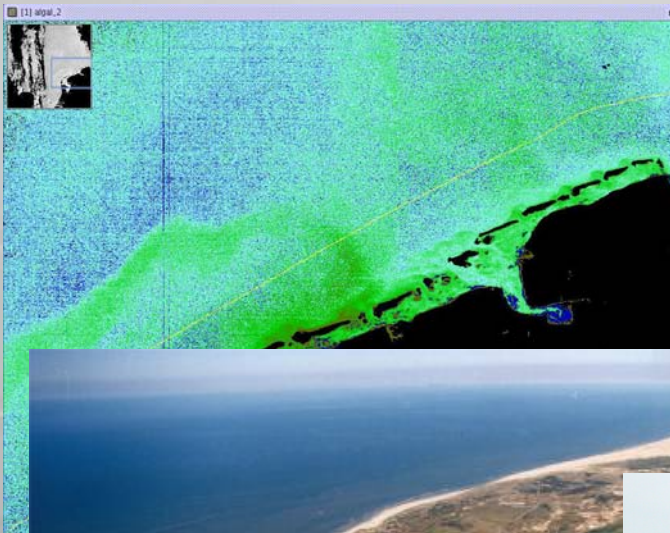
Essential assumption: mortality of phytoplankton is depth dependent (filter feeders)



What is the essential difference between Niedersachsen and the other two regions??

Can we treat the entire Wadden Sea in the same way?

Thanks for your attention!



◆ 2000 ■ 2001 ▲ 2002 ◆ 2003

