

Chapter 3C iii. "Vegetation, soil and freshwater biogeochemistry"

1) Introduction

1.1 Linkages between vegetation, soil and biogeochemistry, large scale issues will be addressed; Only observed trends during the last 200 year will be discussed, both climate and additional drivers will be introduced

1.2 Baltic Sea catchment characteristic; structured between

1.2.1 boreal

1.2.2 cultivated part of the BS catchment that are fundamental different in landscape characteristics and biogeochemistry

1.3 Additional drivers:

1.3.1 Cultural eutrophication from land use , incl biofuel

1.3.2 Damming,

1.3.3 Forestry,

1.3.4 Ditching, wetland losses, hydrological modifications

1.3.5 Atmospheric deposition

1.3.6 hydrology (this is an extra chapter in the BACC book and crosslinkages will be discussed in March with the other BACC lead authors)

2) Boreal part of the catchment

2.1 Observed changes in vegetation (discuss climate related vs additional driver when relevant in each sub-chapter)

2.1.1 Phenology

2.1.2 Physiological tolerance and stress of dominant species

2.1.3 Species and biomes (links to forestry)

2.1.4 Ecosystem productivity and C storage (links to forestry)

2.1.5 Synthesis

2.2 Observed changes in soils (climate related vs additional driver when relevant in each sub-chapter)

2.2.1 Soil types and C, N, P content

2.2.2 Wetland soils and C, N, P storage (links to ditching)

2.2.3 Forest soils and C, N, P storage (links to forestry)

2.2.4 Agricultural soils and C, N, P storage (links to land use)

2.2.5 Synthesis

2.3 Observed changes in lake and river biogeochemistry (climate related vs additional driver when relevant in each sub-chapter)

2.3.1 Nutrient export from agriculture as seen in lakes and rivers (links to runoff)

2.3.2 Ion balance in lakes and river (trace metals, major anions and cations; links to acidification and damming))

2.3.3 Carbon (DOC, DIC) export from forests, wetlands and agriculture (links to acidification and damming)

2.3.4 Synthesis

3) Cultivated part of the catchment

- 3.1 Observed changes in vegetation (discuss climate related vs additional driver when relevant in each sub-chapter)
 - 3.1.1 Phenology
 - 3.1.2 Physiological tolerance and stress of the dominant species
 - 3.1.3 Species and biomes (links to agriculture)
 - 3.1.4 Ecosystem productivity and C storage (links to forestry)
 - 3.1.5 Synthesis

- 3.2 Observed changes in soils (climate related vs additional driver when relevant in each sub-chapter)
 - 3.2.1 Soil types and C, N, P content
 - 3.2.2 Wetland soils and C, N, P storage (links to ditching)
 - 3.2.3 Forest soils and C, N, P storage (links to forestry)
 - 3.2.4 Agricultural soils and C storage (links to land use)
 - 3.2.5 Synthesis

- 3.3 Observed changes in lake and river biogeochemistry (climate related vs additional driver when relevant in each sub-chapter)
 - 3.3.1 Nutrient export from agriculture as seen in lakes and rivers (links to runoff)
 - 3.3.2 Ion balance in lakes and river (trace metals, major anions and cations; links to acidification and damming))
 - 3.3.3 Carbon (DOC, DIC) and nutrient export from forests, wetlands and agriculture (also nutrients??)
 - 3.3.4 Synthesis

- 4) Conclusions: where in the Baltic Sea catchment have climate induced changes been clearly observed and how strong is the climate driver compared to the additional drivers