



WP7: Modelling

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Overview

What is the workpackage?

Introduce PROTECH model

Outline the proposed methodology

What is the workpackage?

Interpretation and forecasting lake sensitivity to environmental change

Aim: To predict the sensitivity of lake phytoplankton to regional climate change

What is the workpackage?

Objectives:

7.1: To test the sensitivities of generic lake types to different drivers of change (climate and non-climate)

7.2: To predict the future response of phytoplankton in different landscape settings e.g. develop regional maps of future cyanobacteria risk

PROTECH

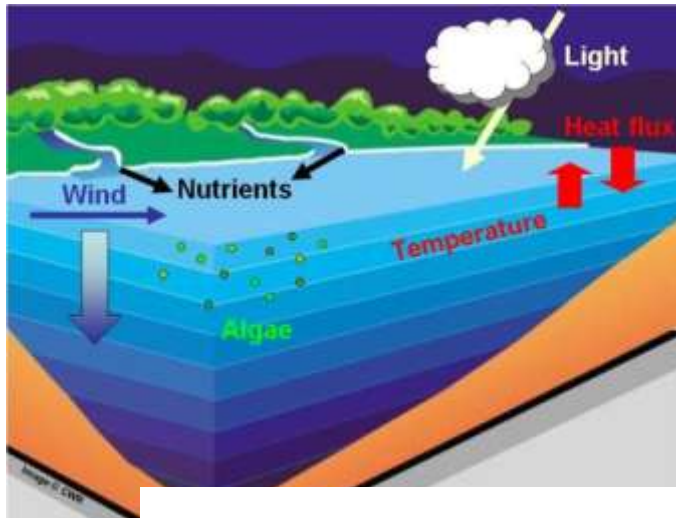
(**P**hytoplankton **R**esp**O**nses **T**o **E**nvironmental **C**Hange)

Language: Fortran77

History: It was developed over the last two decades in CEH by C.S. Reynolds, A.E. Irish and J.A. Elliott

Publications: Over 40 peer-reviewed publications and over 30 commissioned reports

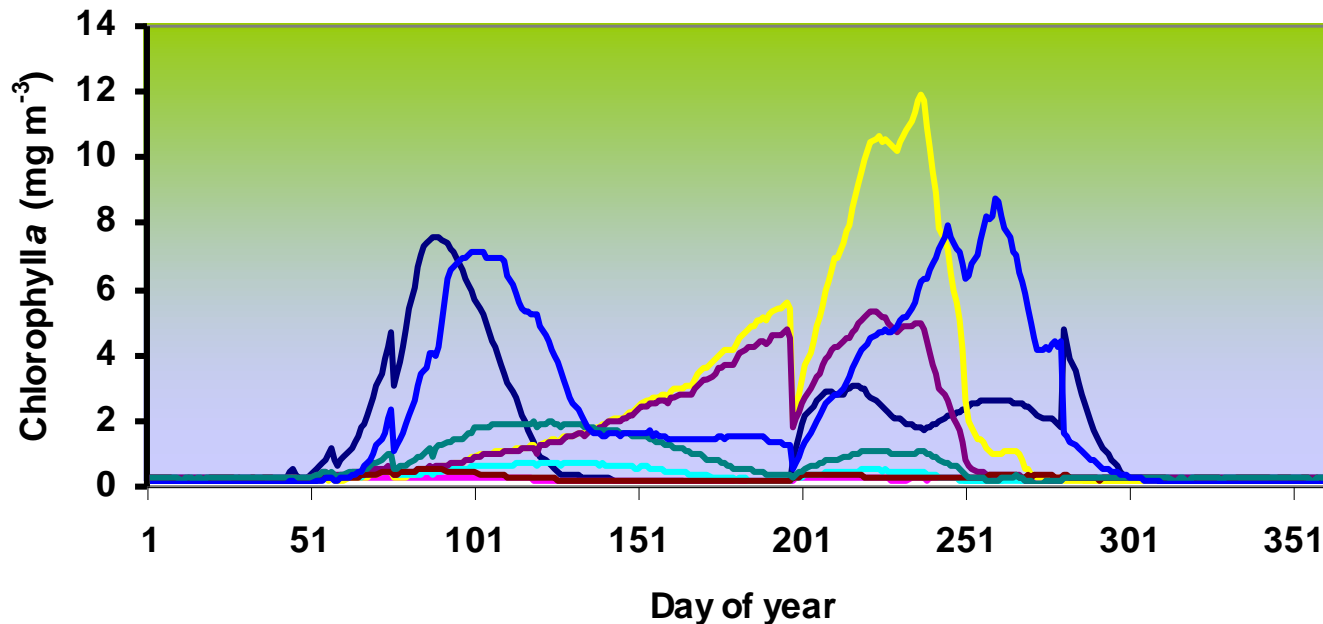
PROTECH



PROTECH

Up to 8 phytoplankton species
• 1 zooplankton group

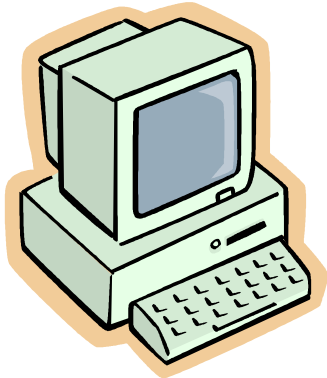
Community simulation



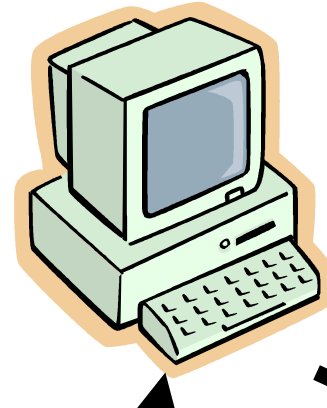
Proposed methodology

Present day

Regional
Climate
Model



PROTECH



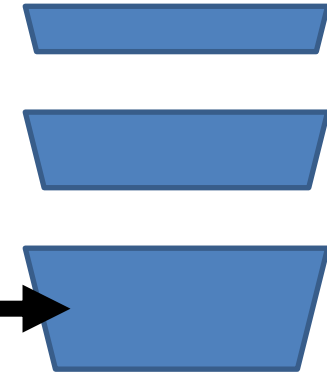
Weather scenarios

Cloud

Wind

Air
temperature

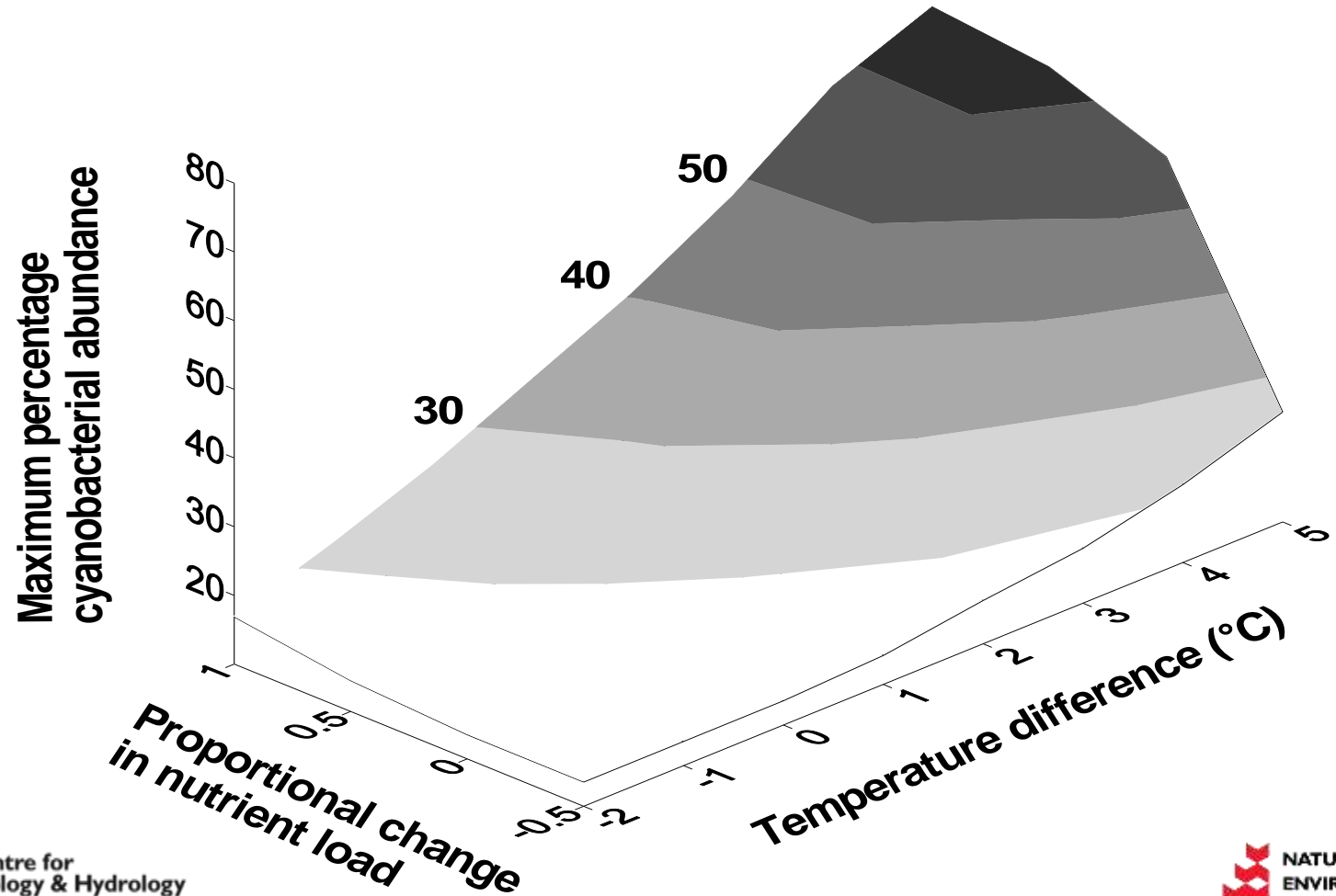
Flow



Lake types

Proposed methodology

Response surface



Proposed methodology

Use response surfaces (total chlorophyll, bloom timing and cyanobacteria biomass) to characterise sensitivity

Lake types that are close to observed lakes can be used to compare model outputs

Finally, repeat method for climate change RCM drivers (e.g. IPCC A1, A2 and B2 scenarios)

Deliverables

D7.1: For each regional, the identification of lake typologies particularly vulnerable to climate change

D7.2: Regional maps of cyanobacteria water quality risk under a range of scenarios