Habitat suitability in the shallow coastal zone: a multiple trophic level approach

Marjolein Post, Martin Baptist & Han Lindeboom
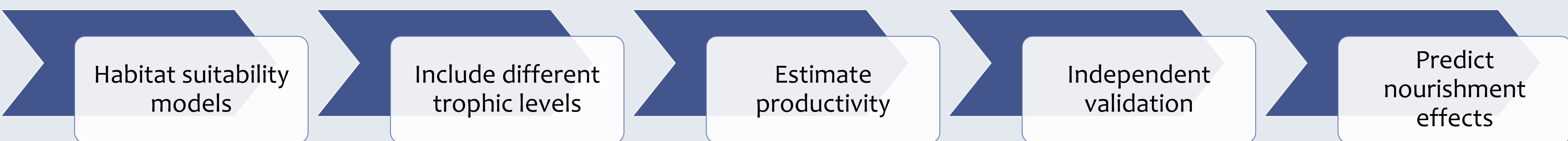
Introduction

A mega-nourishment has immediate impacts on many abiotic conditions, which affect the local marine ecosystem. These changes can potentially alter valuable habitat. An understanding of the underlying processes that drive natural system dynamics is necessary to make reliable predictions of nourishment effects. Our primary objective is to assess the habitat suitability for benthos, flatfish and seabirds in order to estimate the effects of nourishment on their abundance, distribution and productivity

Objectives

* Quantify the relation between habitat factors and species distribution
* Describe and model productivity for different trophic levels
* Predict potential changes in habitat suitability and productivity caused by nourishment
* Assess the ecological impacts of (mega)nourishments

Methods

Identification of essential habitats: predicting species presence based on the suitability of abiotic conditions through the use of datasets with different spatial and temporal coverage to assess temporal habitat dynamics
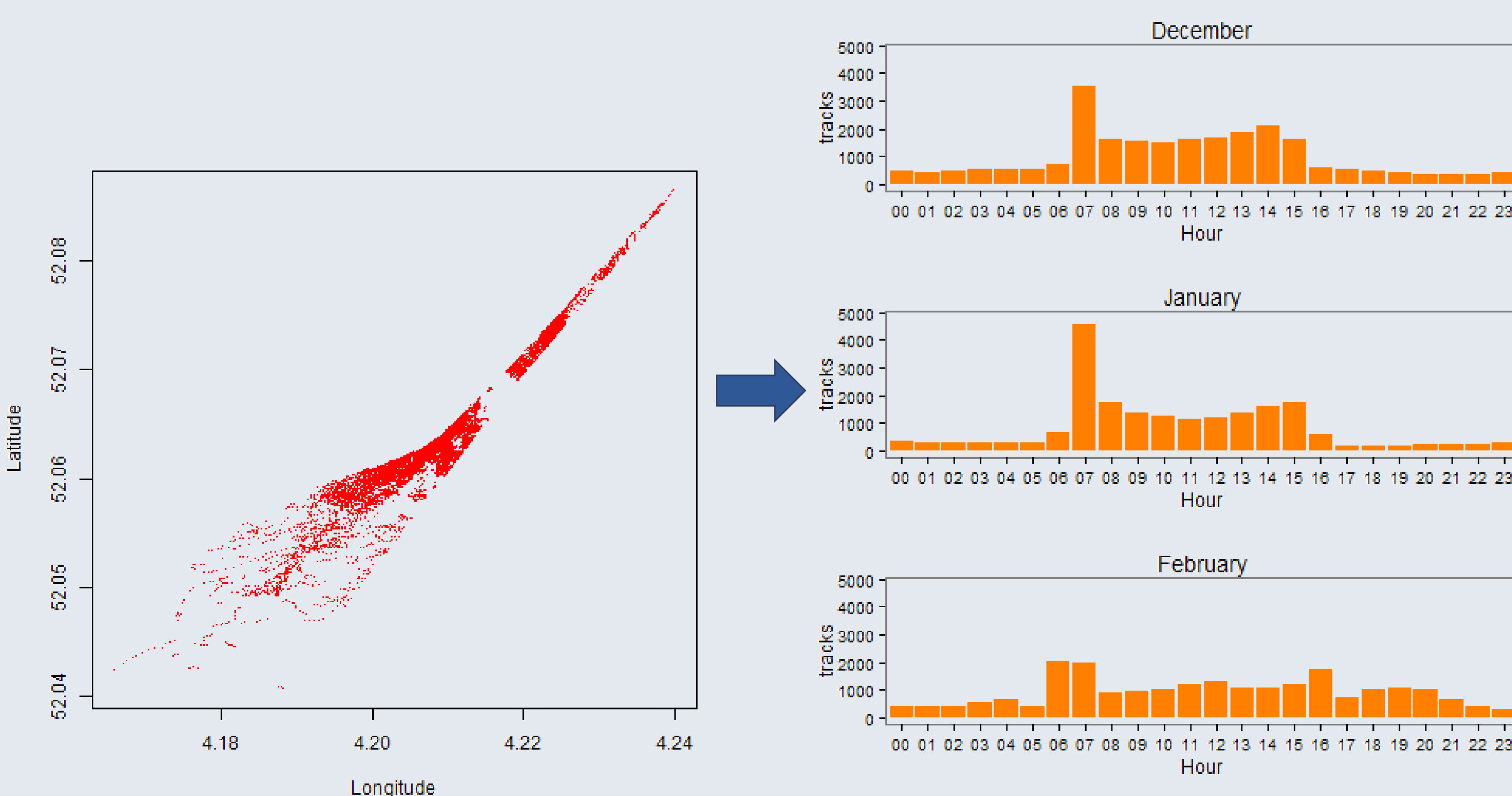
Habitat suitability models → Include different trophic levels → Estimate productivity → Independent validation → Predict nourishment effects

Preliminary results

Habitat suitability for juvenile flatfish based on depth and water visibility
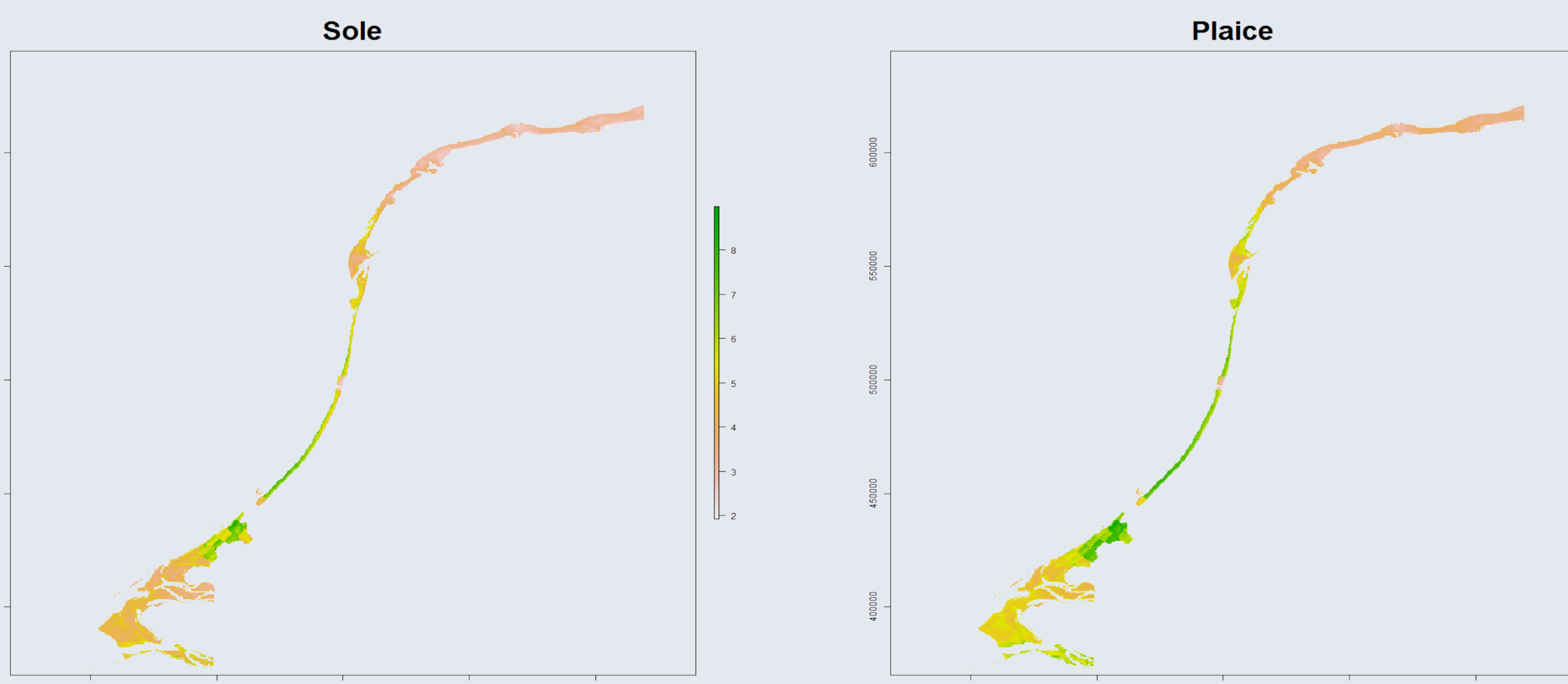
Sole

Plaice

Seabird flight behaviour above the Sand Motor

December

January

February

Interesting outcomes

* Minimal seal presence
* Annual variation in the depth distribution of flatfish
* Lagoon served as a nursery for juvenile Plaice and Sole in 2012

Plaice growth

Mean length Plaice
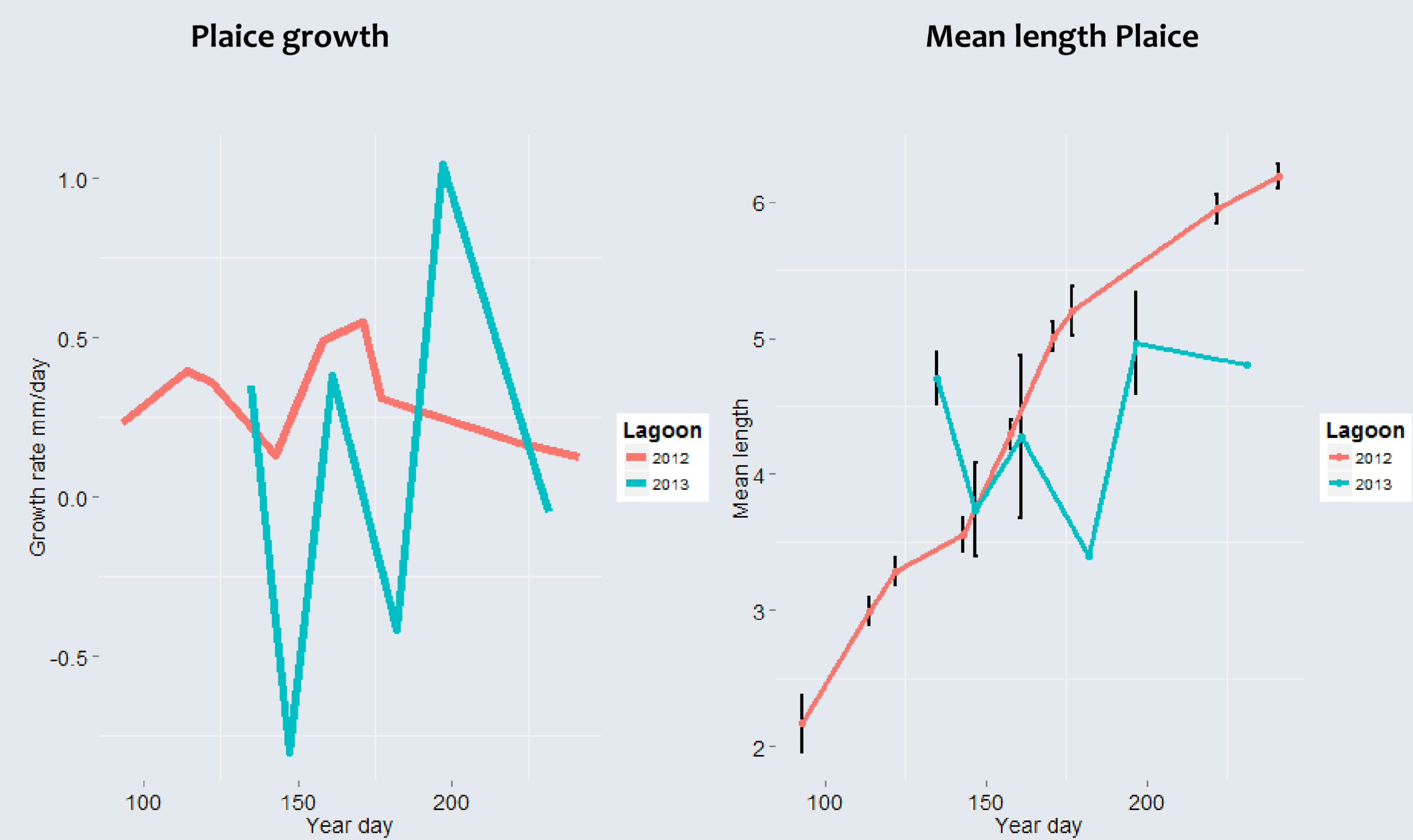
Relevance/Applicability

* Nourishment can differentially affect multiple trophic levels
* Identification of sensitive and valuable areas
* Design of future nourishments
* Useful tool for management, policy and legislative recommendations