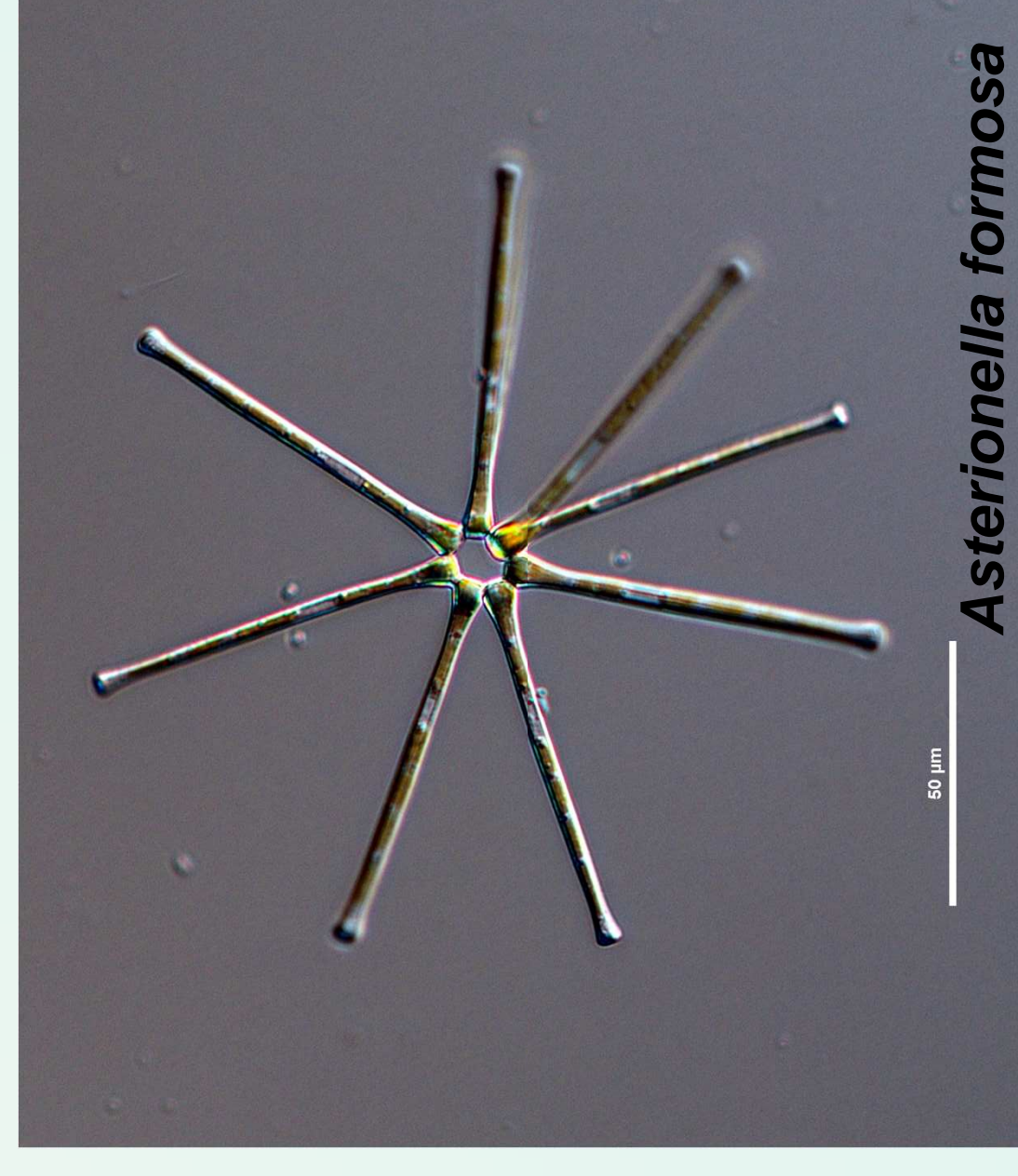
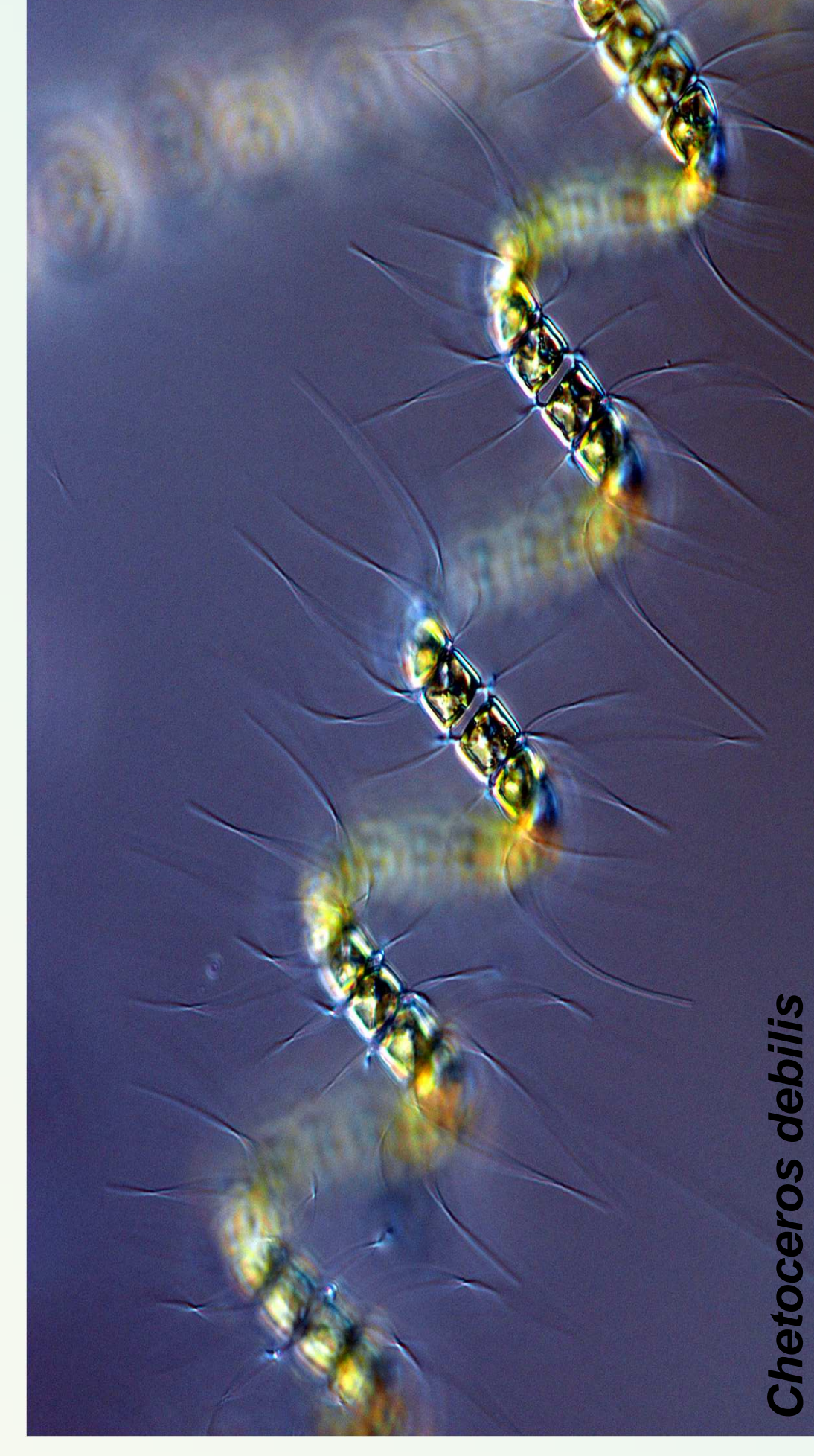


# Phyto'pedia

## The Phytoplankton Encyclopedia Project

**Funding:**  
**TLEF**  
 Department of Earth and Ocean Sciences

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### Introduction

Marine organisms can be used as indicators of environmental change as they respond to changes in physical conditions (temperature, salinity, nutrient concentrations). Used by climatologists to measure and understand environmental change.

A new course, EOSC 442: Climate Measurement and Analysis, being developed for the Combined Majors in Science Program, is designed to introduce 200 students a year to field and laboratory measurements in climate science.

The end goal is to generate a time series record of local climate change with contributions made by students in this course.

It is critical to have a well-designed guide and reference available to the students. To this end we hope to develop a digital encyclopaedia of local plankton, reflecting seasonal variability, created from samples taken at Jericho pier (the class sampling site).

### Objectives

Facilitate teaching and outreach activities on phytoplankton through the creation of an easy to use database

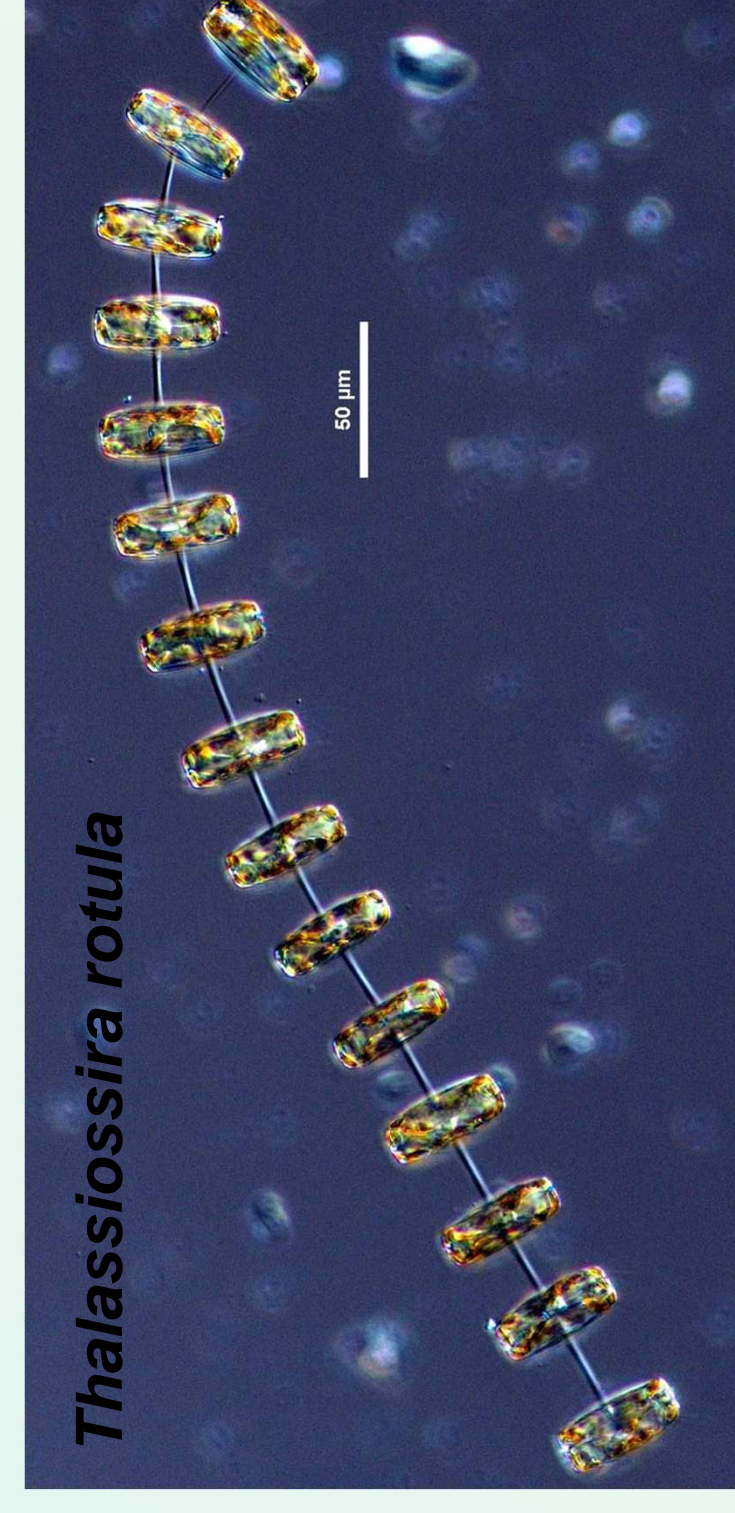
1. Provide a new guide to local plankton including critical taxonomic details and identifying characteristics and general ecological information
2. Provide a base for the time-series data that EOSC 442 students will use to study environment change on long timescales (climate change), intermediate timescales (El Niño), or short-term phenomena (harmful blooms, environmental disturbances, e.g. oil spills)
3. Provide an image-based record of seasonal variability in our local ocean ecology that is available to the wider university community and the public.

### Methods

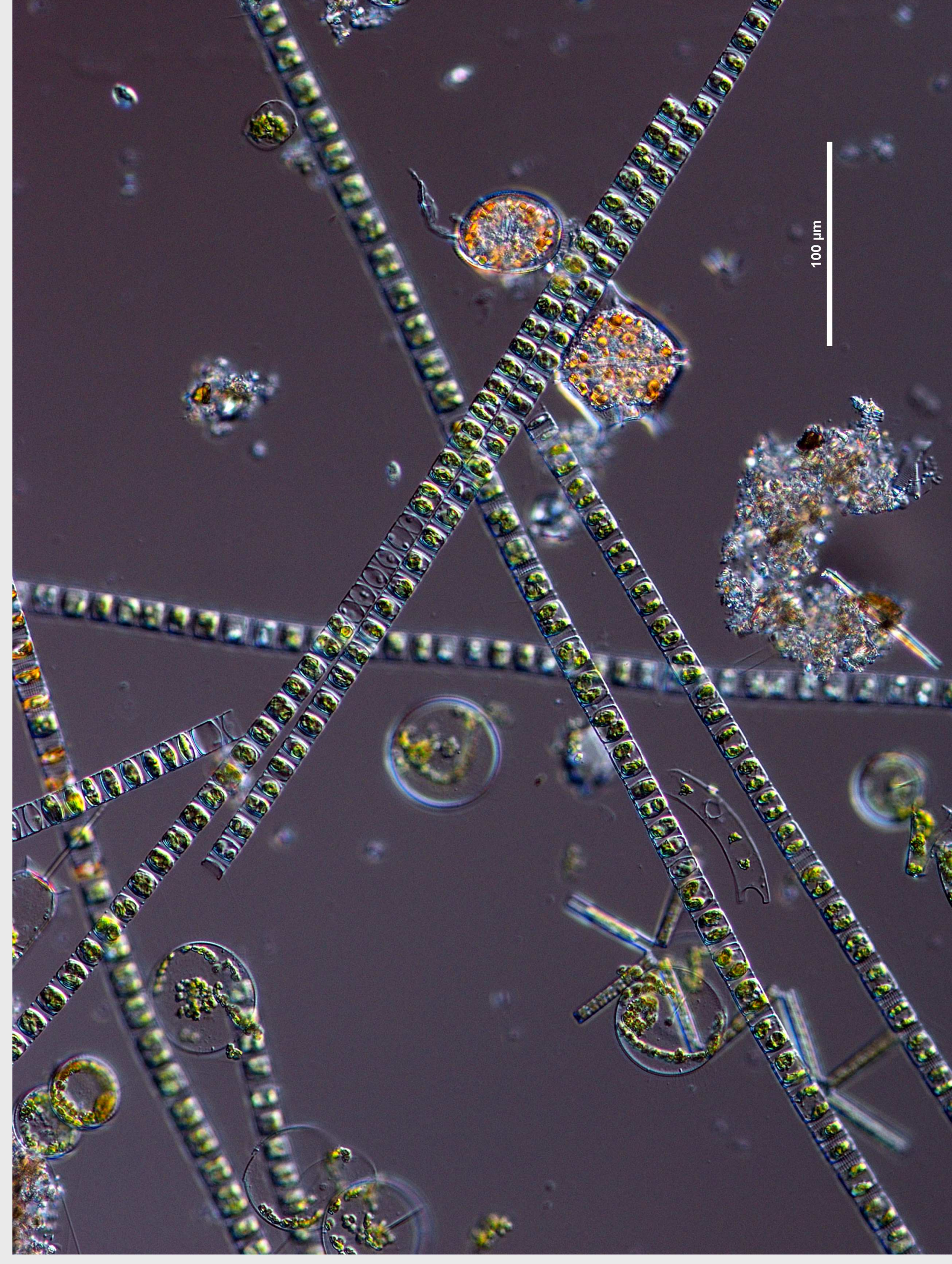
- 20µm mesh size net
- Samples at Jericho beach twice a week for a full year
- Observed under a Nikon 80i microscope fitted with an advanced 12Mp camera
- This student-driven project counts with a team of graduate and undergraduate students

### Expected results

- Web-based photographic guide of the ±100 most common species in Jericho beach
- Complete taxonomical and ecological description for each species with easy access to the information for in-class discussion
- Embedded glossary for technical terms
- High resolution zoomable images of typical seasonal composition
- Simple dichotomous key for common genera
- At-a-glance photographic collection for fast identification



### High resolution zoomable images (virtual slides)



Typical phytoplankton composition during spring

### Detailed species profiles

Phyto'pedia - The Phytoplankton Encyclopedia Project

Research > Phytoplankton

*Skeletonema costatum*

Chetoceros chain

Skeletonema chains

Synonym(s)  
*Microna costata* Greville, 1866 (basonym, homotypic) (Guiry and Guiry, 2011)

Classification  
 Empire Eukaryota  
 Kingdom Chromista  
 Subkingdom Chromobionta  
 Infrakingdom Heterokonta  
 Phylum Bacillariophyta  
 Class Coscinodiscophyceae  
 Subclass Coscinodiscophytidae  
 Order Thalassiosiraales  
 Family Skeletonemaceae  
 Genus *Skeletonema*  
 Species *S. costatum* (Greville) Cleve 1873  
 (Guiry and Guiry, 2011)

Lifestyle  
 Photosynthetic; Reproduction sexual and asexual (Guiry 2011). Resting stage can survive up to 6 years (Lewis 1959).

Description  
 Cells are cylindrical and united in long chains by external tubes of striated processes arranged in a ring around the cell margin. Valves are circular and the valve face is convex to flat. The valve structure is difficult to see with LM. The striated processes are semicircular in cross section, expanding at their ends to form spines that interlock with the striated processes from the adjacent cell, from which a 3-4 µm spiral line - the spiral - extends from the cell margin. The spiral between cells is very distinct in the resting form.

General	Classification
Shape: Cylindrical	Centric diatom
Size: 2-61 µm Length, 2-21 µm Diameter	Description
Colour: Yellow-brown	2-61 µm Length, 2-21 µm Diameter
Connection: Ring of striated processes	Colour: Yellow-brown
Covering: Silica frustule	Connection: Ring of striated processes
Flagella: None	Covering: Silica frustule
Chloroplast: Two per cell	Flagella: None
Lifestyle: Photosynthetic, Sexual/asexual	Chloroplast: Two per cell
Resting stage present.	Lifestyle: Photosynthetic, Sexual/asexual
Causes water discoloration	Resting stage present.
Harmful effects: Anoxic waters during blooms, produces reactive aldehydes.	Causes water discoloration
Distribution: Global	Harmful effects: Anoxic waters during blooms, produces reactive aldehydes.
Habitat: Neritic	Distribution: Global
Geographic region: Highest abundance in spring	Habitat: Neritic
Salinity: 18 - 25 PSU (optimal)	Geographic region: Highest abundance in spring
Temperature: 25 °C (optimal)	Salinity: 18 - 25 PSU (optimal)
	Temperature: 25 °C (optimal)

**Annotated high quality images**

**Easily accessible profiles of the ~100 most common species in BC**

**Quick access to general overview and defining details for in-class discussion**

**Complete detailed taxonomic and ecologic, information**

**Pop-up glossary for technical terms**