



Bringing Maps to Life: Audience, Ethics, and Design

Chiara Phillips
Cartographer & Solutions Engineer @Seqana

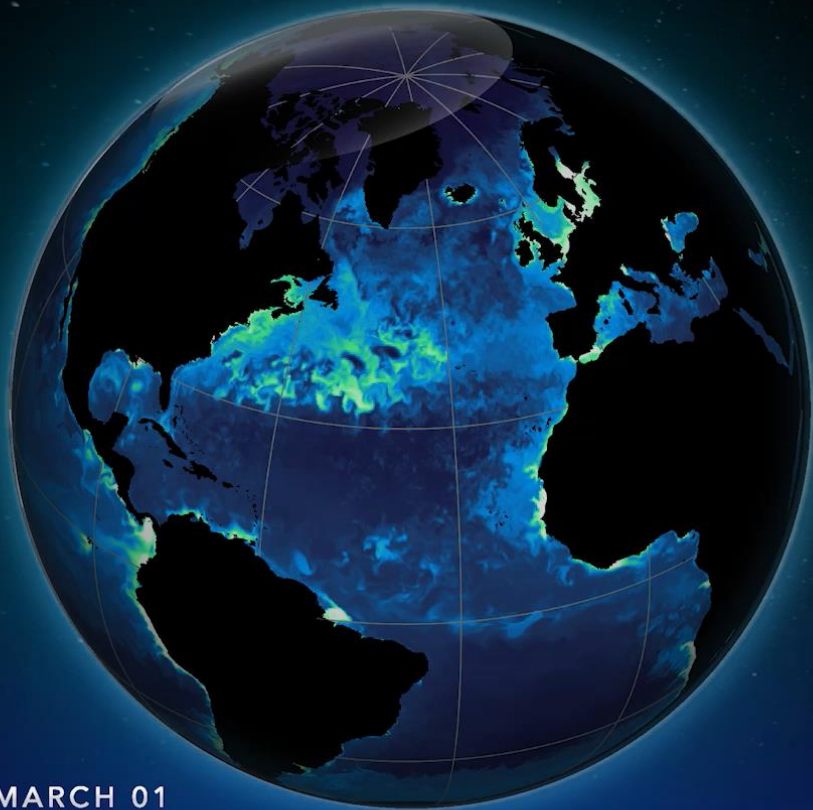


AED: Saving lives & saving maps

- Making something effective
- AED of cartography: Audience, ethics, and design



2024 SPRING PHYTOPLANKTON BLOOM



Chlorophyll-a concentration (mg/m³)



With the arrival of spring in the North Atlantic, longer days, calmer seas, and nutrients stirred up by winter storms fuel massive phytoplankton blooms that spark a cascade of ocean life.

Cartography

Chiara Phillips | chiaraphillips.com

Created with QGIS, Adobe Illustrator, Adobe Premiere

Modeled data

Global Ocean Biogeochemistry Analysis and Forecast.
E.U. Copernicus Marine Service Information (CMEMS).
Marine Data Store (MDS). DOI: 10.48670-moi-0015.
(Accessed on 09-02-2025)

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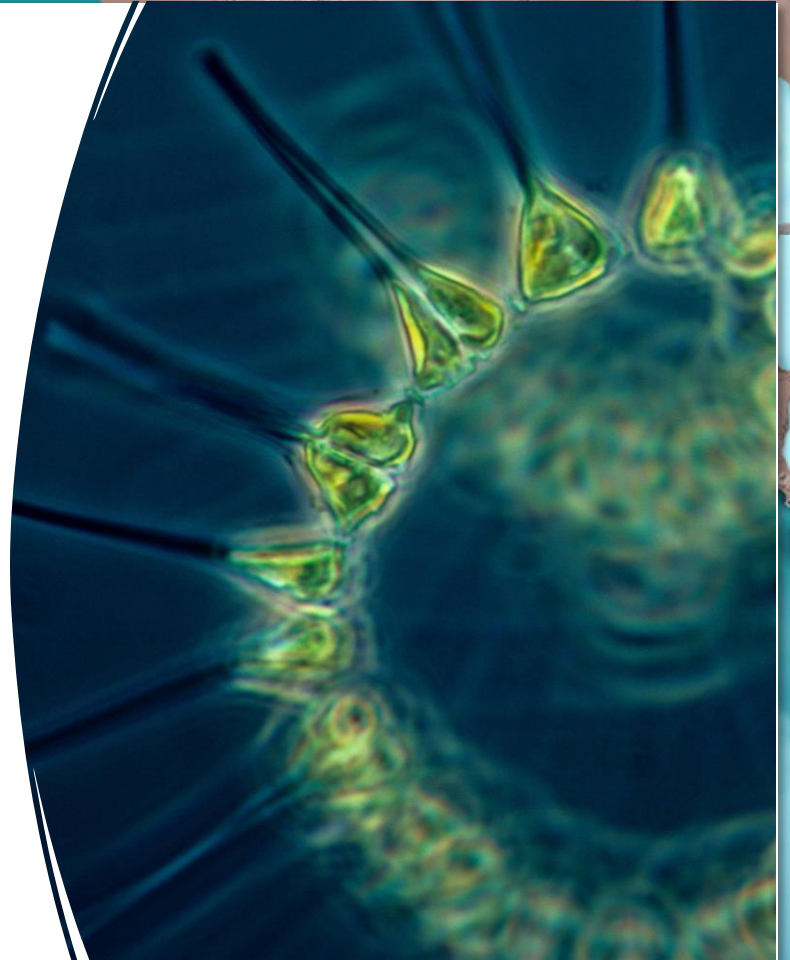
A: Audience

- **Who:** Aspiring data visualizers, map-makers
- **How:** Webinar
- **Goal:** Make the North Atlantic spring phytoplankton bloom visually-engaging and easy to understand



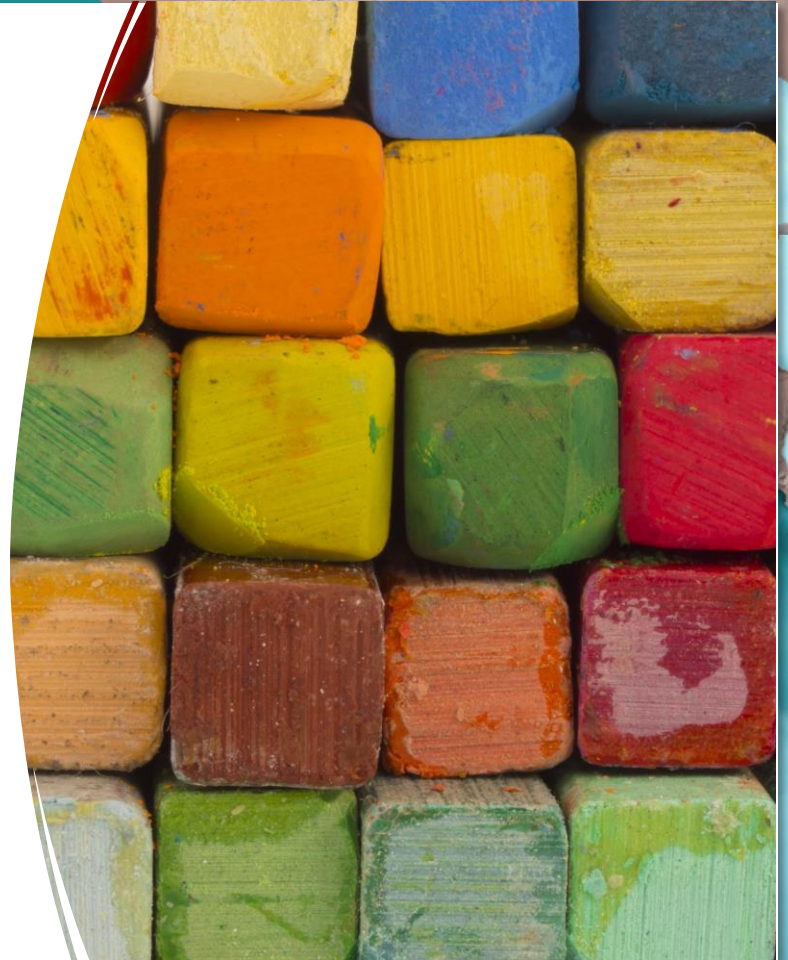
E: Ethics

- "The best way to learn is to teach"
- Being honest, intentional, accurate, not doing harm
- Make it possible for others to reproduce your work

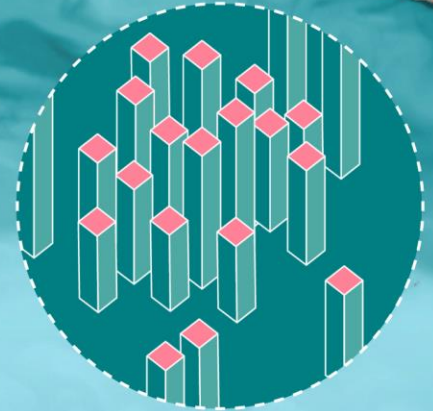
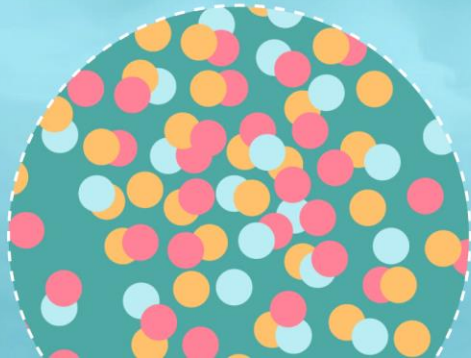


D: Design

- **Visual hierarchy** - intuitive color, composition, contrast, size, white space, etc...
- **Accessibility** - Coblis color-blindness simulator, WCAG guidelines

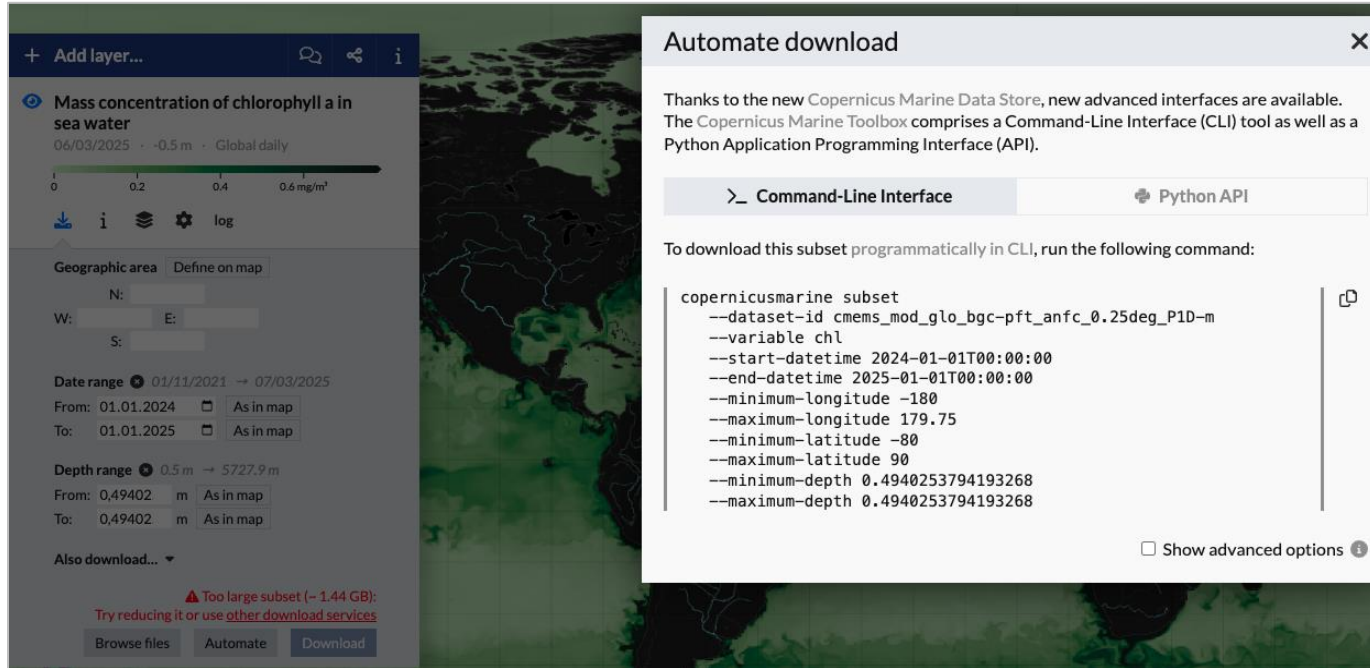


"AED" in practice



Data collection & preparation

- copernicusmarine Python command line interface



The image shows a screenshot of the Copernicus Marine Toolbox interface. On the left, a map displays the 'Mass concentration of chlorophyll a in sea water' layer, with a color scale from 0 to 0.6 mg/m³. The interface includes controls for geographic area (N, W, E, S), date range (01/11/2021 to 07/03/2025), and depth range (0.5 m to 5727.9 m). A warning message indicates the subset is too large (~1.44 GB) and suggests reducing it or using other download services. Buttons for 'Browse files', 'Automate', and 'Download' are visible.

Automate download

Thanks to the new Copernicus Marine Data Store, new advanced interfaces are available. The Copernicus Marine Toolbox comprises a Command-Line Interface (CLI) tool as well as a Python Application Programming Interface (API).

Command-Line Interface Python API

To download this subset programmatically in CLI, run the following command:

```
copernicusmarine subset
--dataset-id cmems_mod_glo_bgc-pft_anfc_0.25deg_P1D-m
--variable chl
--start-datetime 2024-01-01T00:00:00
--end-datetime 2025-01-01T00:00:00
--minimum-longitude -180
--maximum-longitude 179.75
--minimum-latitude -80
--maximum-latitude 90
--minimum-depth 0.4940253794193268
--maximum-depth 0.4940253794193268
```

Show advanced options

2024 Chlorophyll-a concentration in the North Atlantic

Average daily chlorophyll-a concentration by 10° latitude block, 30°N to 70°N

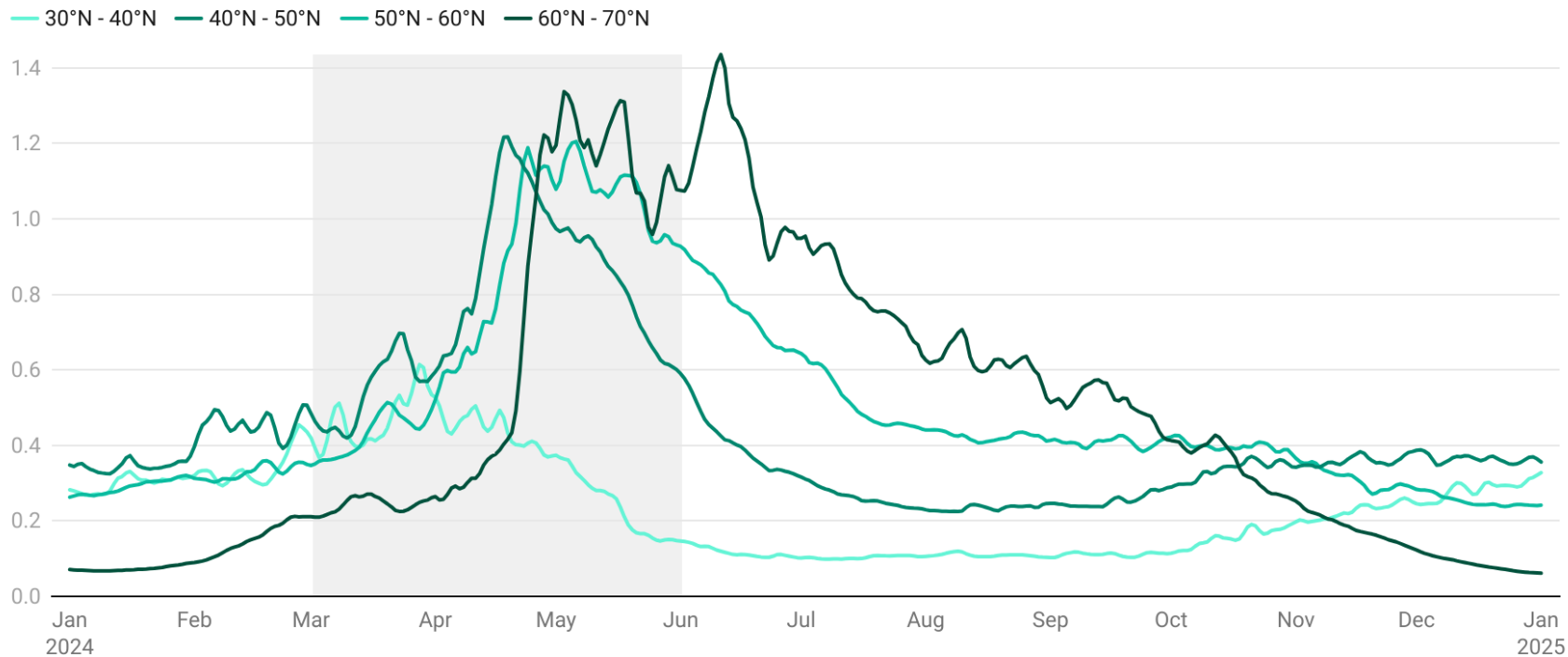
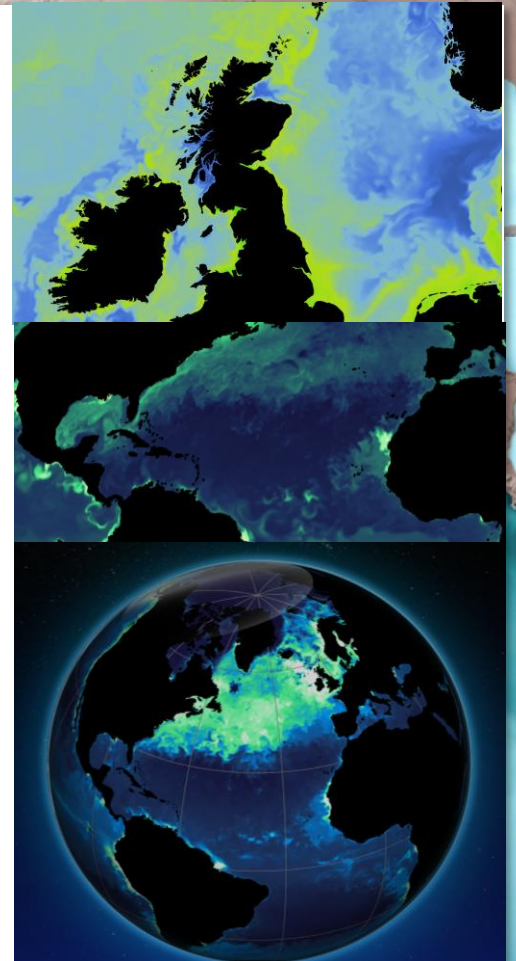
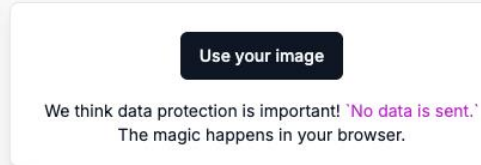
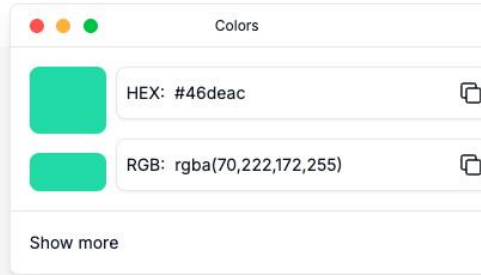
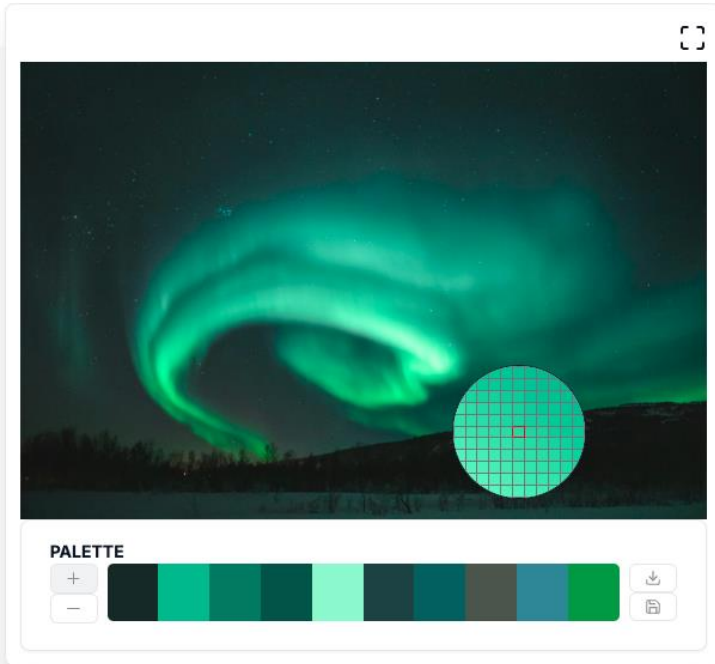


Chart: Chiara Phillips • Source: Copernicus Marine Service (DOI: 10.48670/moi-00015) • Created with Datawrapper

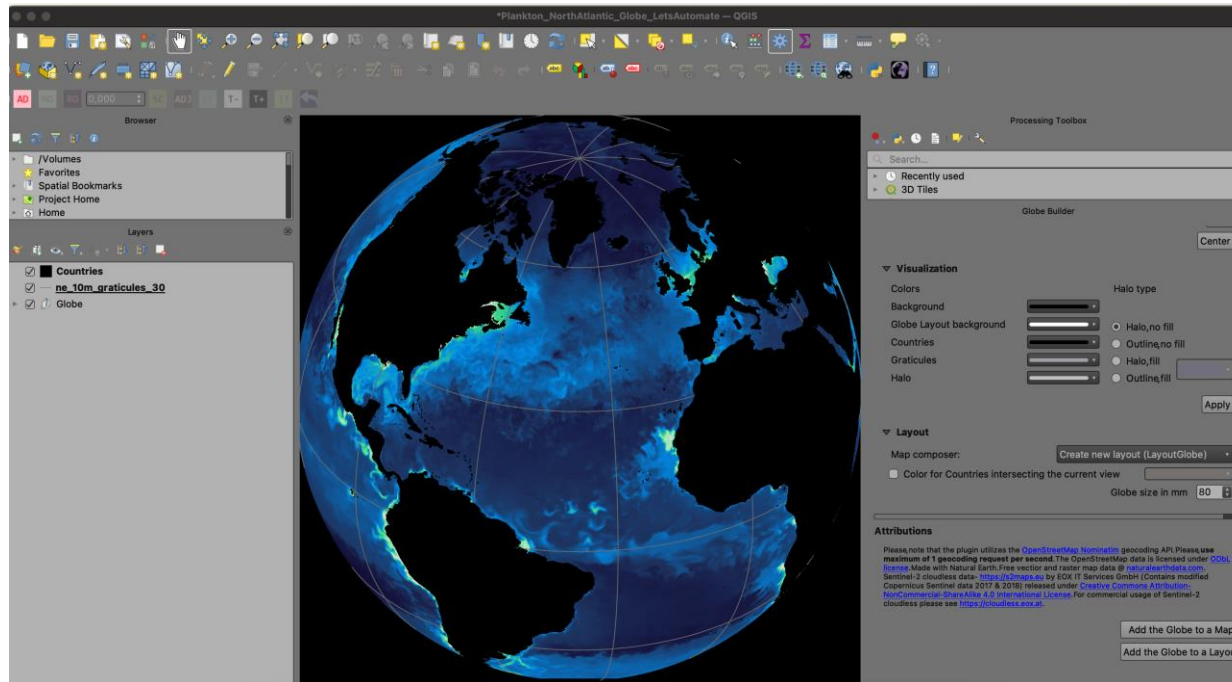
Choosing an effective color palette

- Contrast, accessibility, ability to show truthful patterns in the data



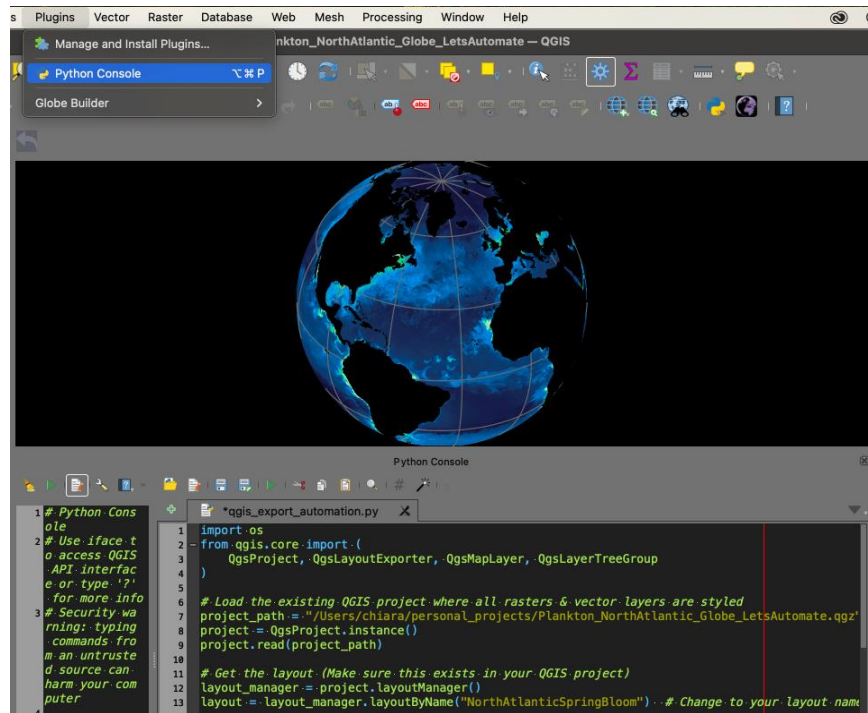
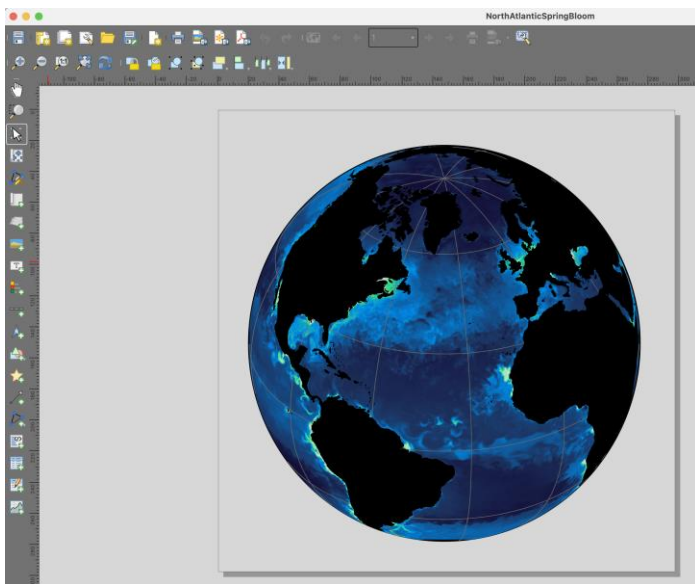
Building the map base in QGIS

- GlobeBuilder plug-in, copying/mass pasting style



Automating QGIS exports

- QGIS Python console



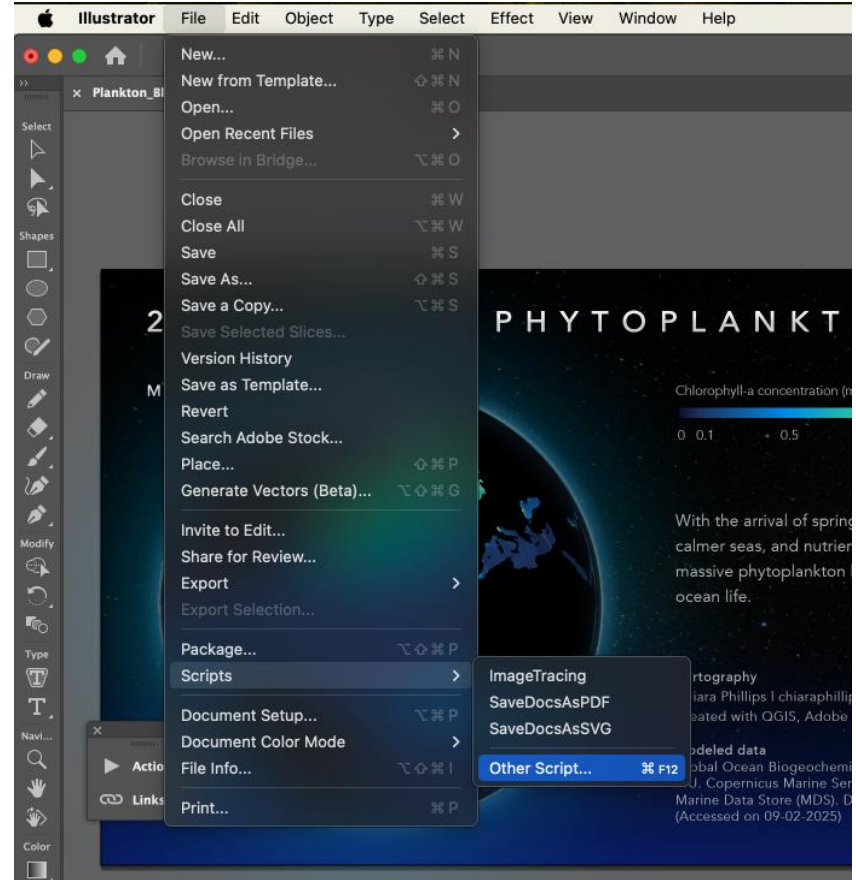
Automating Adobe exports

Adobe Illustrator

- Layout
- Custom script export: 92 images
- Replacing globe image and date

Adobe Premiere

- Adjusting speed & exporting as video

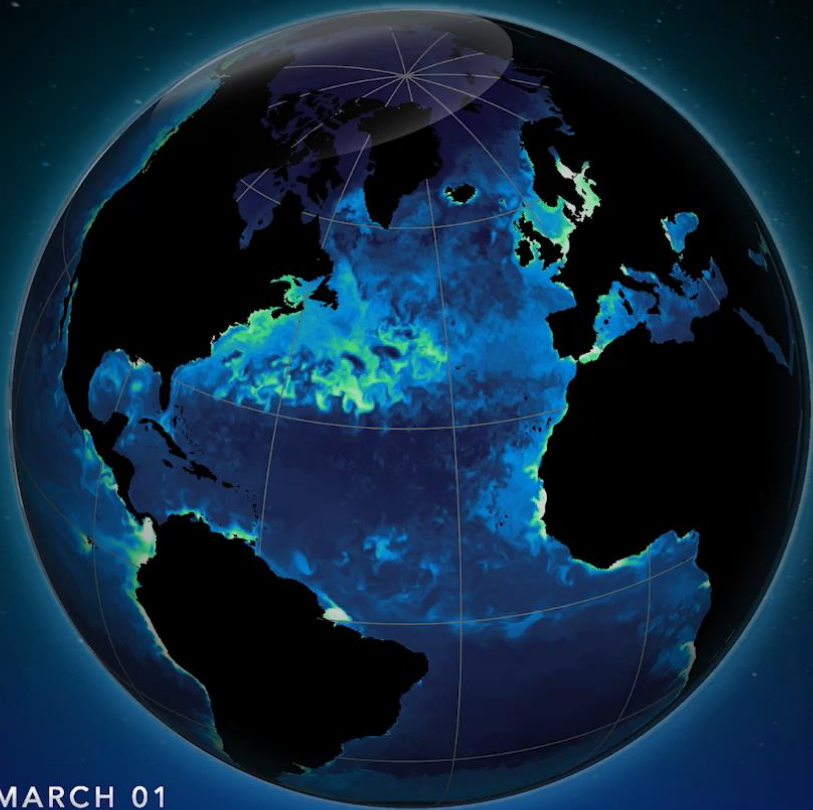


...& go through the cycle again!

- Audience
- Ethics
- Design



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