

Deltares

Enabling Delta Life



SeaDataCloud Online visualization

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People

- Fedor Baart
- Cindy van de Vries
- Giorgio Santinelli

Agenda



Methodology



Examples



Feedback

Methodology



Story



Inspiration



Canvas



Data



Wrangle



Shape

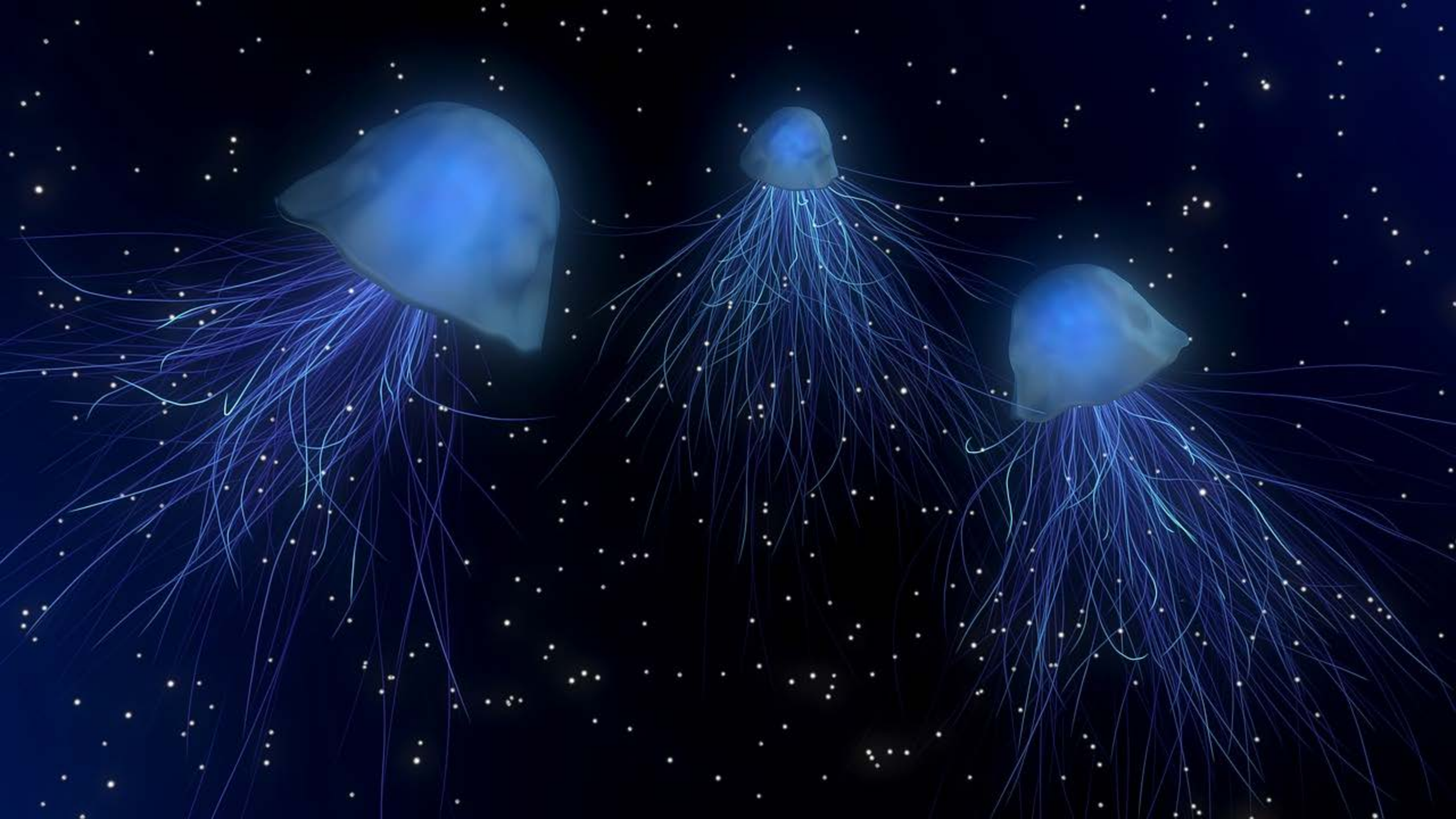


Color



Interactivity





Inspiration



 **Infinise@**
Laboratories
For Visual
Advancement

June 20, 1989

Select your facility:

a: NOTES
b: WORK
c: DOWNLOADS
d: LABORATORY
e: ABOUT

Canvas

U + R1 BACK ON TRACK (HOLD)

L2 BRAKE / REVERSE
GEAR UP
RUDDER LEFT (AIR) **U**

R2 ACCELERATE
GEAR DOWN
RUDDER RIGHT (AIR) **R1**

L1 EXTEND MINI MAP **△**
CHANGE CAMERA **○**
HORN **□**
PHOTO MODE **×**

R1 MAIN MENU **○**
MAP **□**
TOOL MENU **△**
CANCEL **○**
NITRO / VALID **×**
HANDBRAKE **□**

L3 LEAN FORWARD **L**
TURN / AIR CONTROL **L**
LEAN BACKWARD **L**
SMOKE ON/OFF (AIR) **L3**

R3 FAST FAV
AIR
WATER **R** **R** **R** GROUND

R TURN CAMERA
R BACKVIEW



Ostend

VUURTORENWIJK

Hazegras

Langestraat

Jozef II-straat

Vindictivelaan

Marinebasis
Bootsman Jonson

Vuurtorenweg

Vuurtorendok-West

Wandelaarkaai

Victorialaan

Hendrik Baelskaai

Vismijnlaan

Taboralaan

De Rudderstraat

Voorhavenlaan

Voorhaven

Ghent-Bruges-Ostend

Stelplaats De
Lijn Oostende

Westkaai Vlotdok

Vlotdok

Koninklijke Ba

Van Iseghemlaan

Leopoldpark

Leperstraat

fons Pieterslaan

Kairostraat

enigde Natieslaan

Brugge-
de —
Hendrik

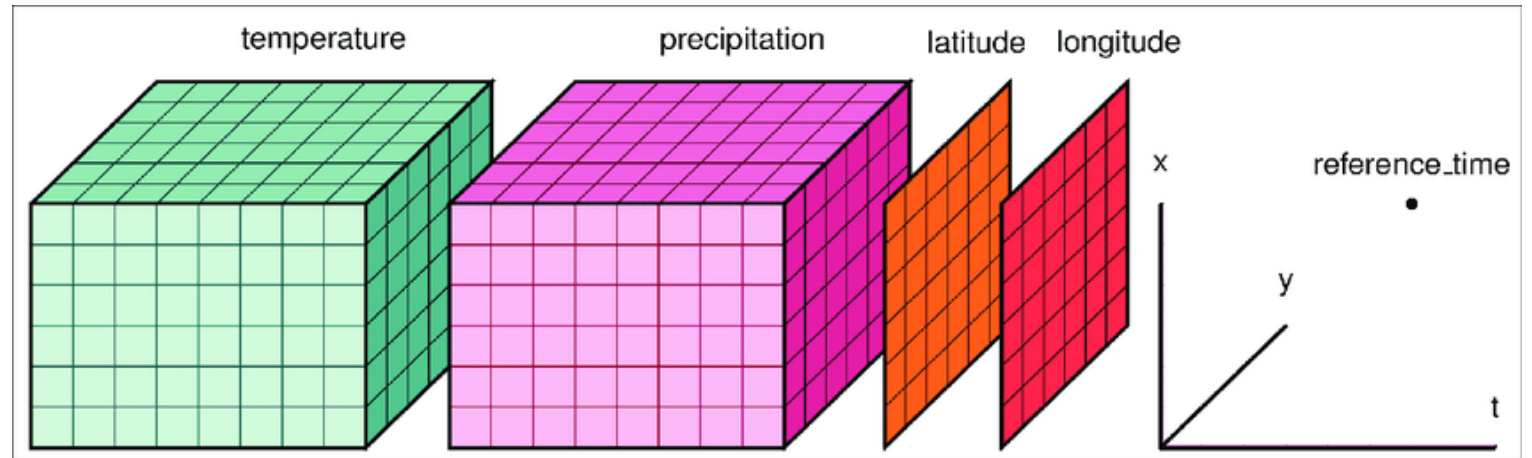
Data

- Trajectory: $v(t)$ $y(t)$ $x(t)$ $z(t)$ t
- Profile: x , y , $v(t)$ $z(t)$ t
- Station: x , y , $v(t)$ t
- Multiple variables
- Multiple trajectories/profiles per cruise
- Multiple stations



Wrangle

- NetCDF as:
 - NetCDF v.4
 - NetCDF CF 1.6+ compliant



- Openearth.eu

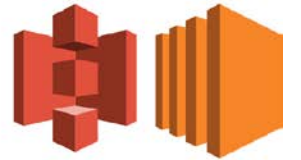
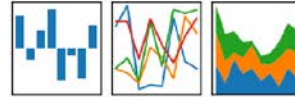


Toolbox



pandas

$$y_{it} = \beta' x_{it} + \mu_i + \epsilon_{it}$$



scikit-image
image processing in python



PixiJS

matplotlib



WebGL™

three.js



npm



LO



Leaflet



- Docker containers

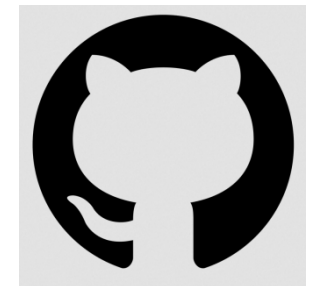


- Test VM

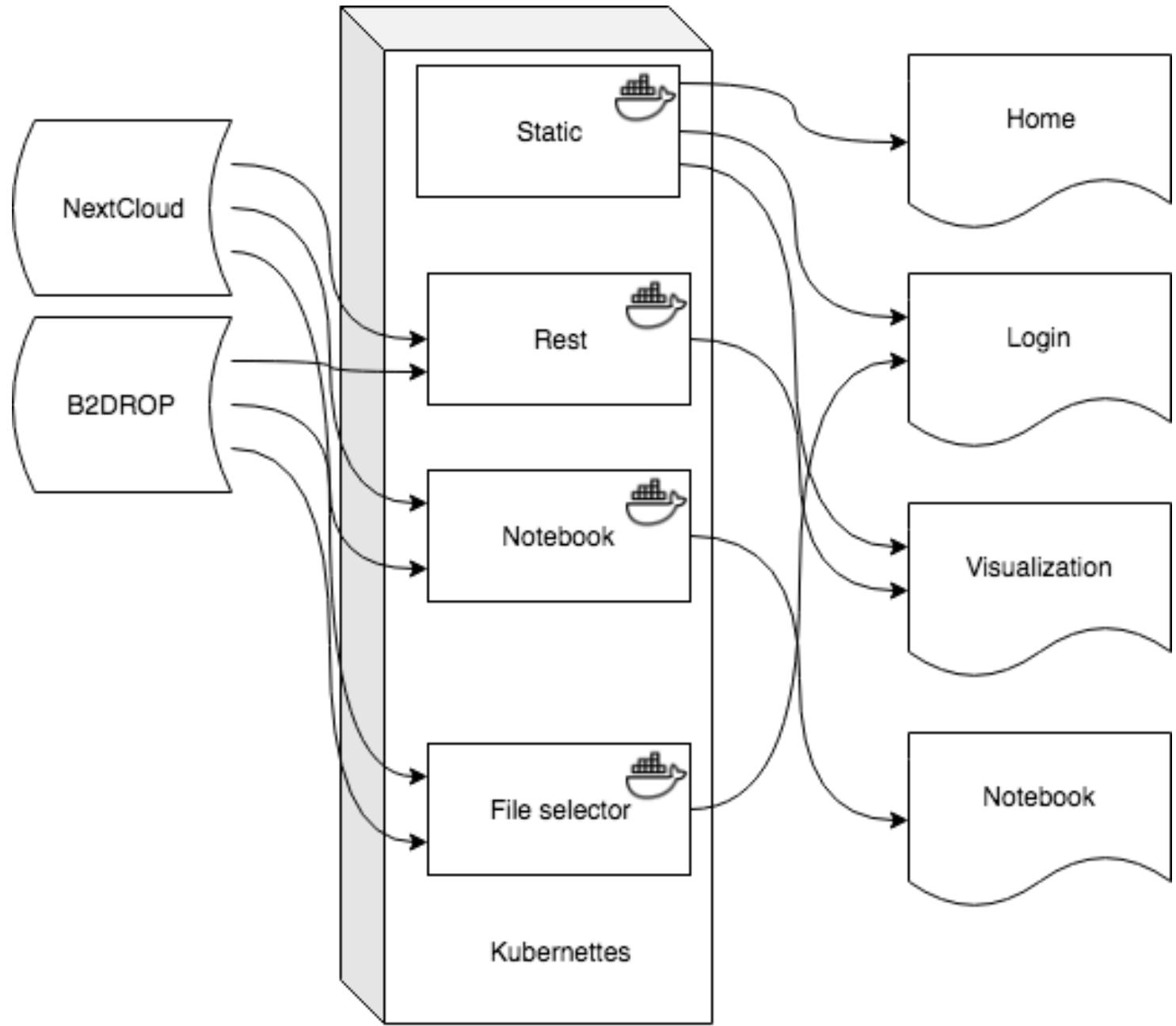


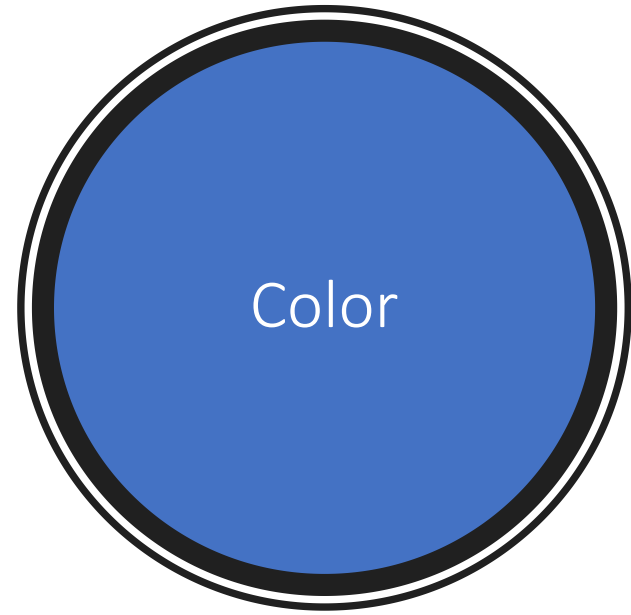
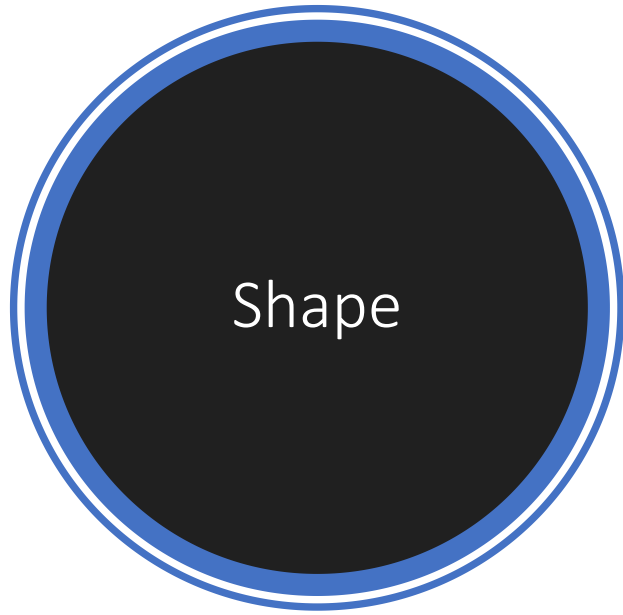
- Dockerfile on Github.

<https://github.com/openearth/sdc-visualization>

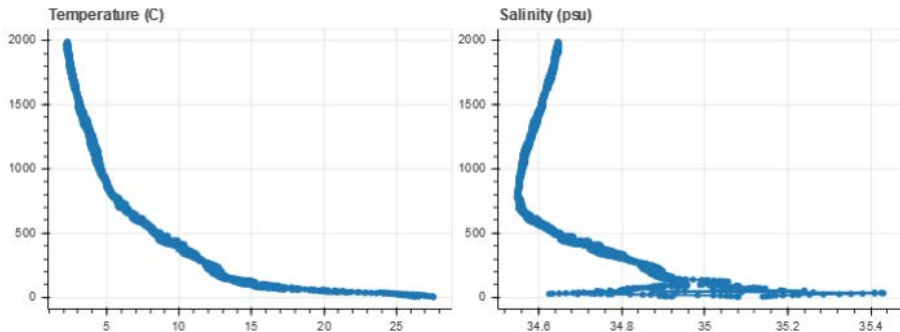


Architecture





- Dynamically generated
- Interactive
- HTML output

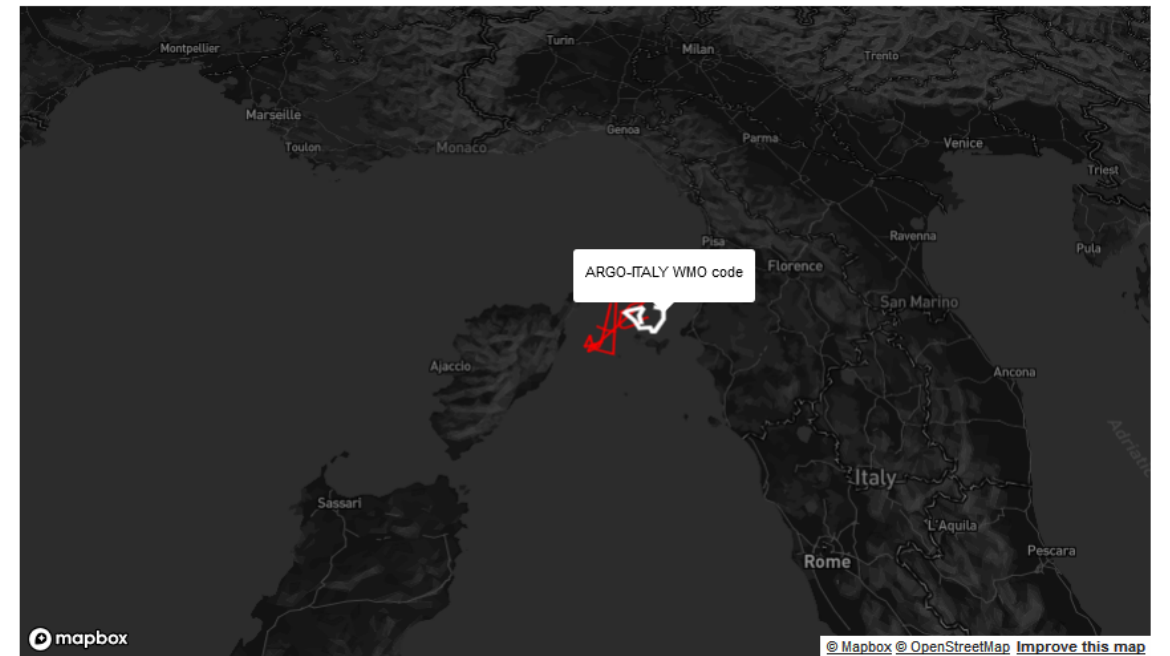


Create Visualization in Mapbox

Use html to create a div. In Javascript add a mapbox component. When clicking on an element a bokeh plot will appear.

```
In [6]: %%html
<head>
  <meta name='viewport' content='initial-scale=1,maximum-scale=1,user-scalable=no' />
</head>
<div id='map_div' class='layer' style='width: 50vw; height: 50vh' />
<div id='data' style='width: 50vw; height: 50vh; background-color: white;' />

<style>
  path { mix-blend-mode: lighten; }
  .leaflet-zoom-animatd { isolation: leaflet-zoom-animatd; }
</style>
```



- Follow up of the mini use case
- Interactive
- HTML output



r2018/ODV_NC_visualizing.ipynb 90% python get colorar values

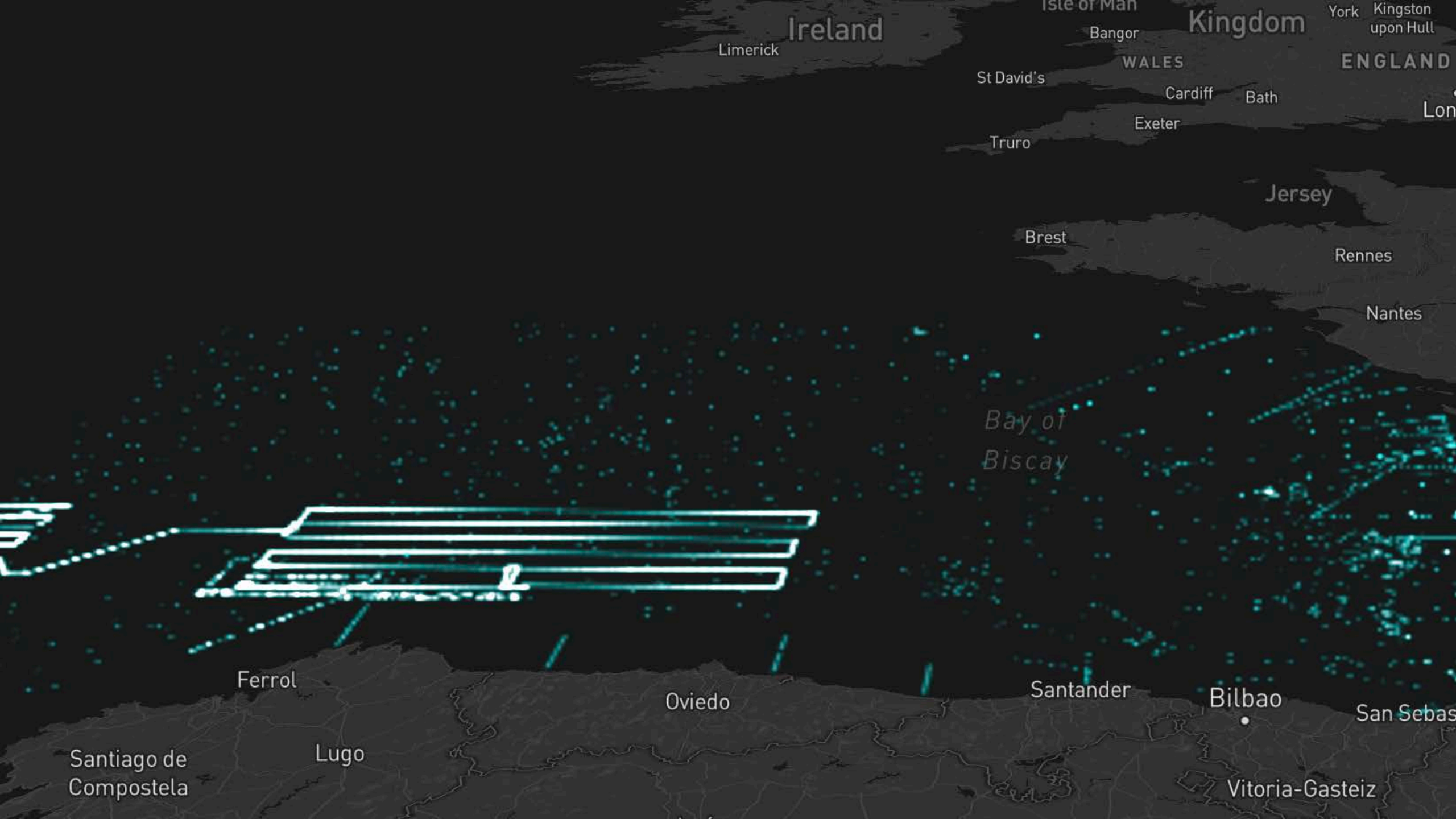
OpenEarth Basemap Vuetify Docker Hub neo4j@bolt lro-packages Swagger Metocean NC Kickstarter Git Cheatsheet DDV Caffe

jupyter ODV_NC_visualizing Last Checkpoint: 22 minutes ago (autosaved) Logout

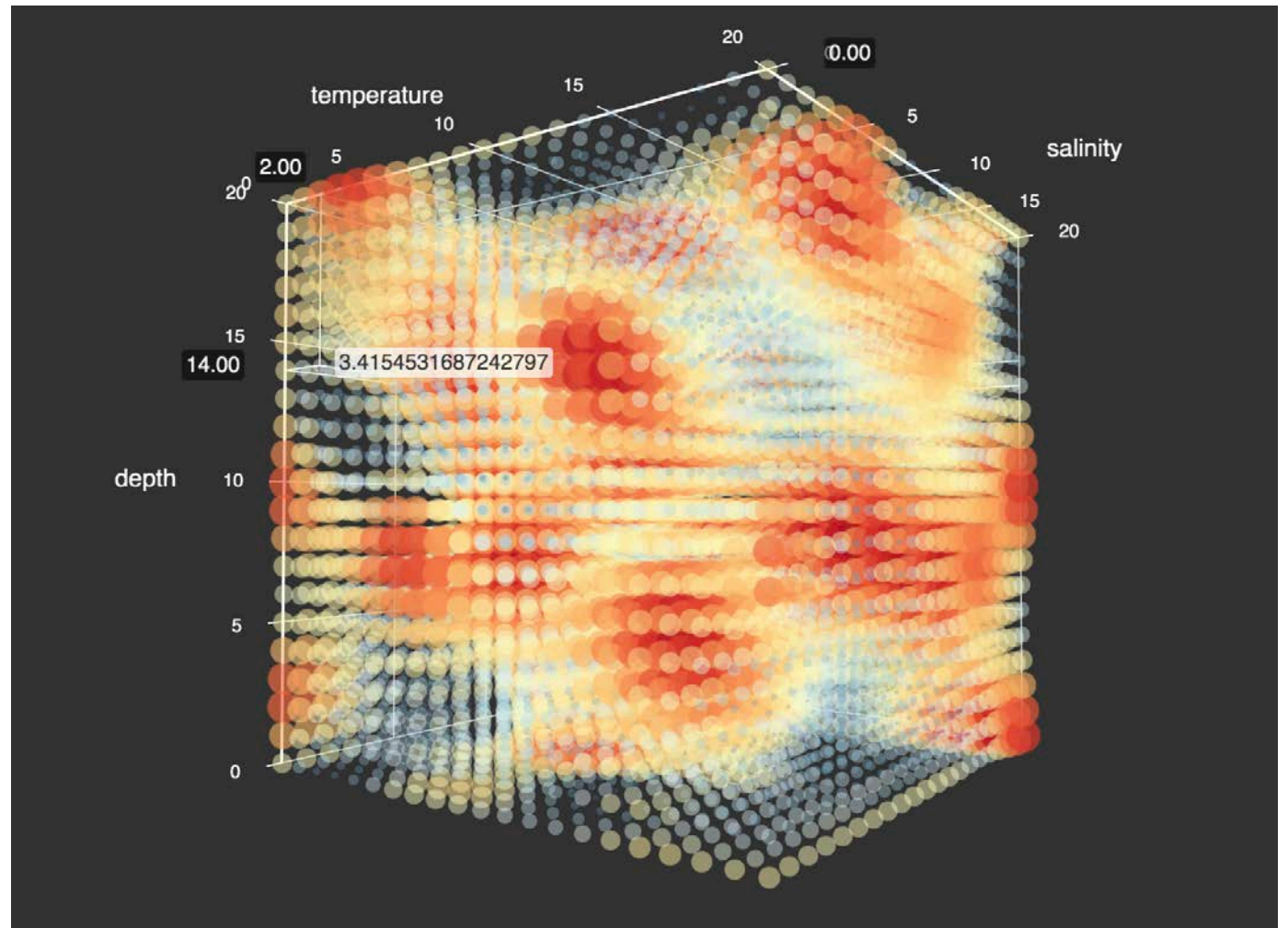
File Edit View Insert Cell Kernel Widgets Help Trusted Python 3

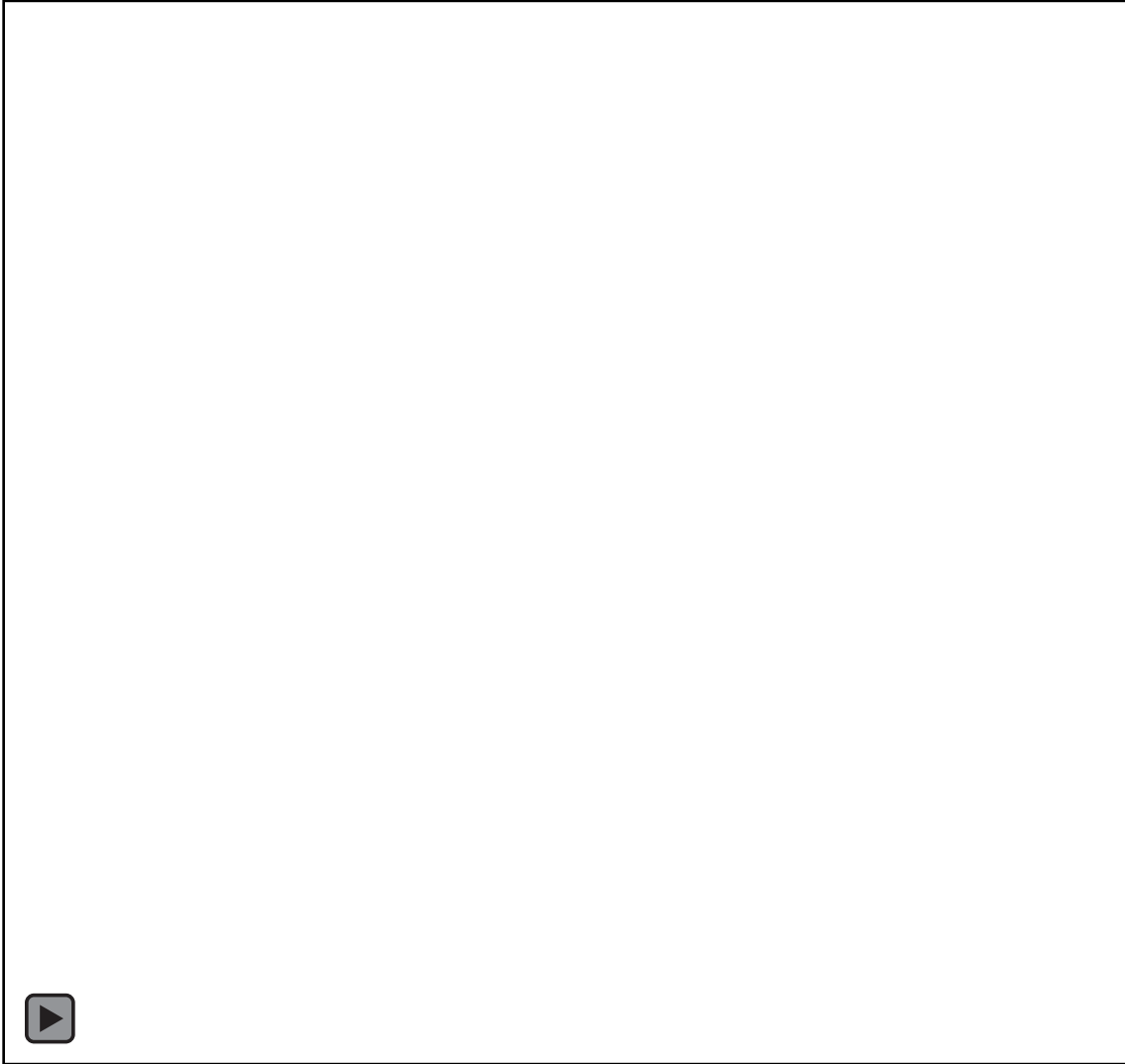
```
In [5]: %html
<head>
<meta charset="utf-8" name="viewport" content="initial-scale=1,maximum-scale=1,user-scalable=no" />
<script src="https://api.tiles.mapbox.com/mapbox-gl-js/v0.44.2/mapbox-gl.js"></script>
<link href="https://api.tiles.mapbox.com/mapbox-gl-js/v0.44.2/mapbox-gl.css" rel="stylesheet" />
</head>
<div id="map_div" class="layer" style="width: 45vw; height: 80vh"/>
<style>
path { mix-blend-mode: lighten; }
.leaflet-zoom-animatd { isolation: leaflet-zoom-animatd; }
</style>
```

A screenshot of a Jupyter Notebook showing HTML code for a map visualization. The code uses Mapbox GL JS to create a heatmap overlay on a map of Europe. The heatmap shows a color gradient from yellow to purple, indicating varying values across the region. The map includes labels for cities like Livorno, Siena, Bastia, and Corsica.




3D example





3D Map of temperature

< Relief shading

+ Layer 

14 layers [Filter layers](#)

- hillshading
- contour-line-index
- contour-line**
- waterways
- wetlands
- snow
- glacier
- water
- sand
- national-parks
- woods
- grass
- crops
- background

contour-line Style Select data

Default value #000000

Height Property fun... >


Base height > 0 meters









Color Property fun... >

Pattern > none

Opacity > 1

Translate > 0, 0

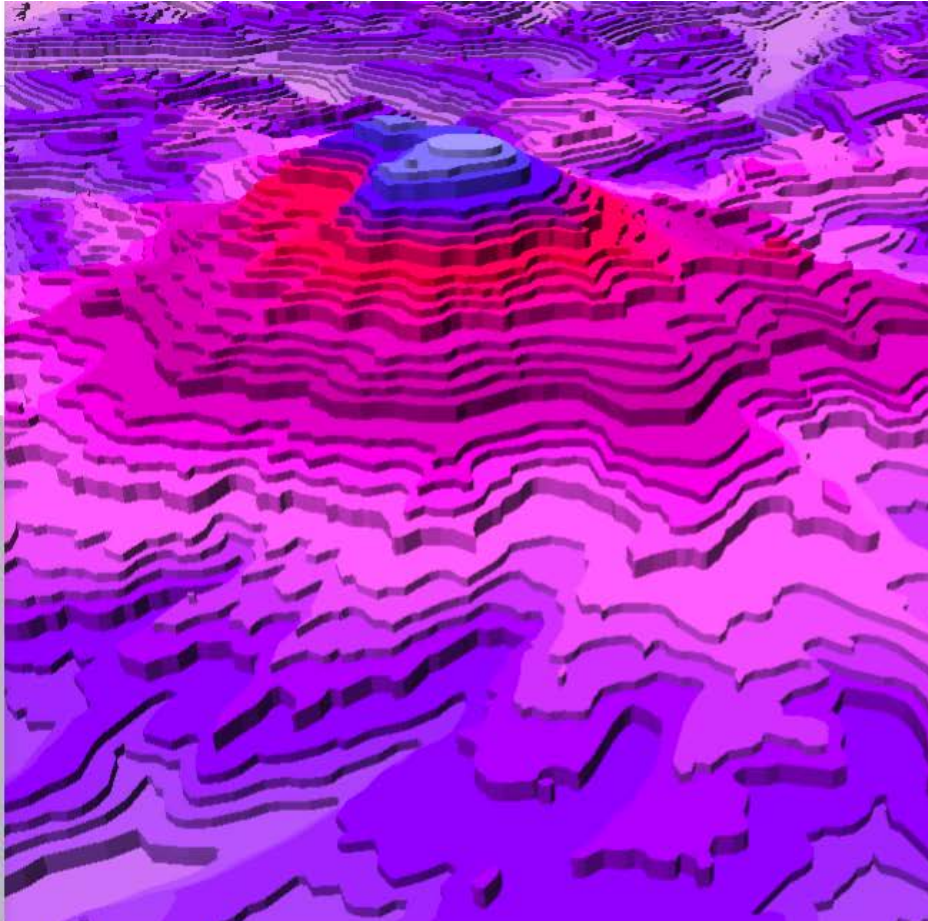
Translate anchor > 

Ele	Fill color
0	hsl(324, 89%, 
1500	hsla(259, 71%, 
2000	hsl(292, 84%, 
2500	hsla(307, 93%, 
3000	hsl(308, 92%, 
3500	hsla(353, 74%, 
4000	hsla(237, 91%, 
4500	hsl(245, 94%, 

+ Add stop

+ Add zoom level

▲ Edit property as JSON



Demo



Go to VRE



Login with app credentials



Select a file



Visualise

Go to VRE server <https://orca.dkrz.de/>

Private workspace

webODV import

webODV quality control

webODV visualization

webODV data extractor

Stop webODV

DIVA Jupyter Notebook

VIZ

ERDDAP

Visualization

Create visualizations on the map

GO

Open the visualization



Visualization

Create visualizations on the map

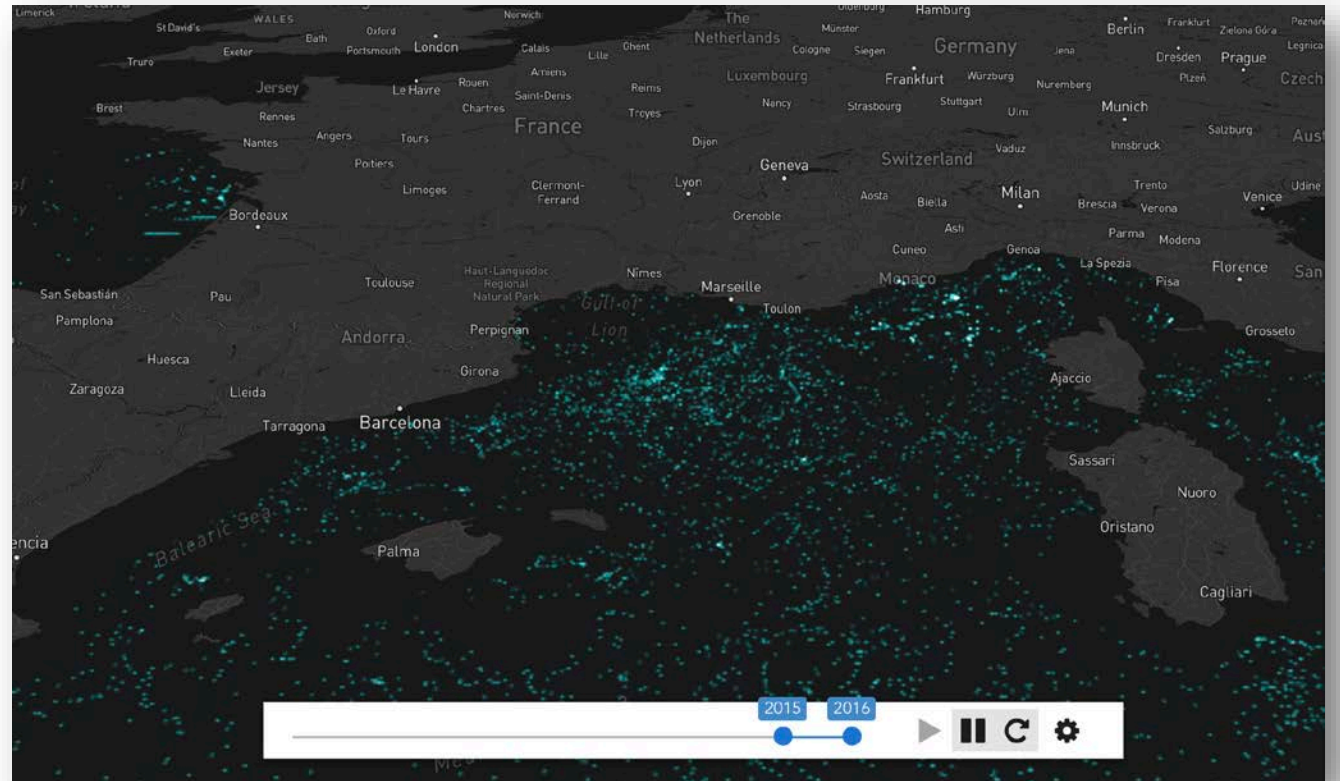
GO



Visualization

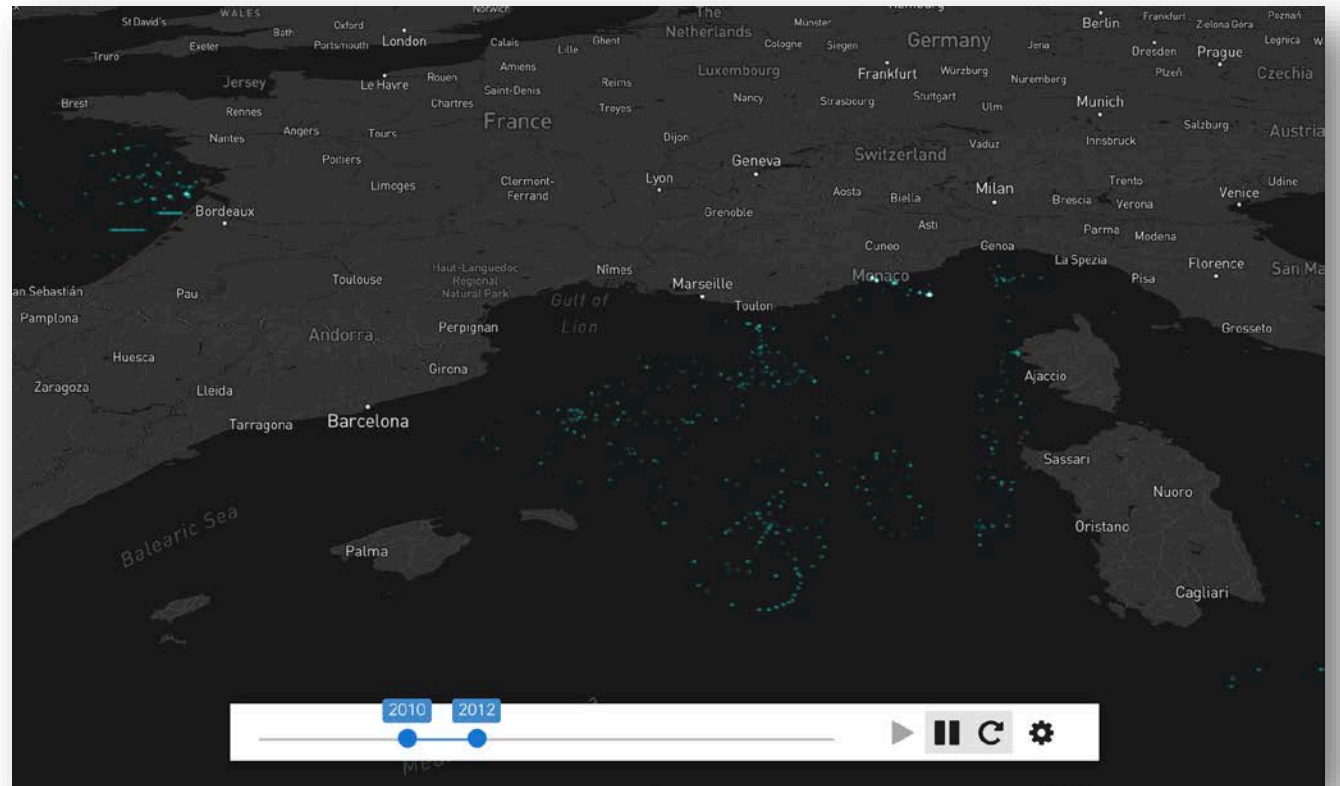
Map visualization

- Zoom (mouse wheel)
- Pan (mouse)
- Tilt (right mouse drag)

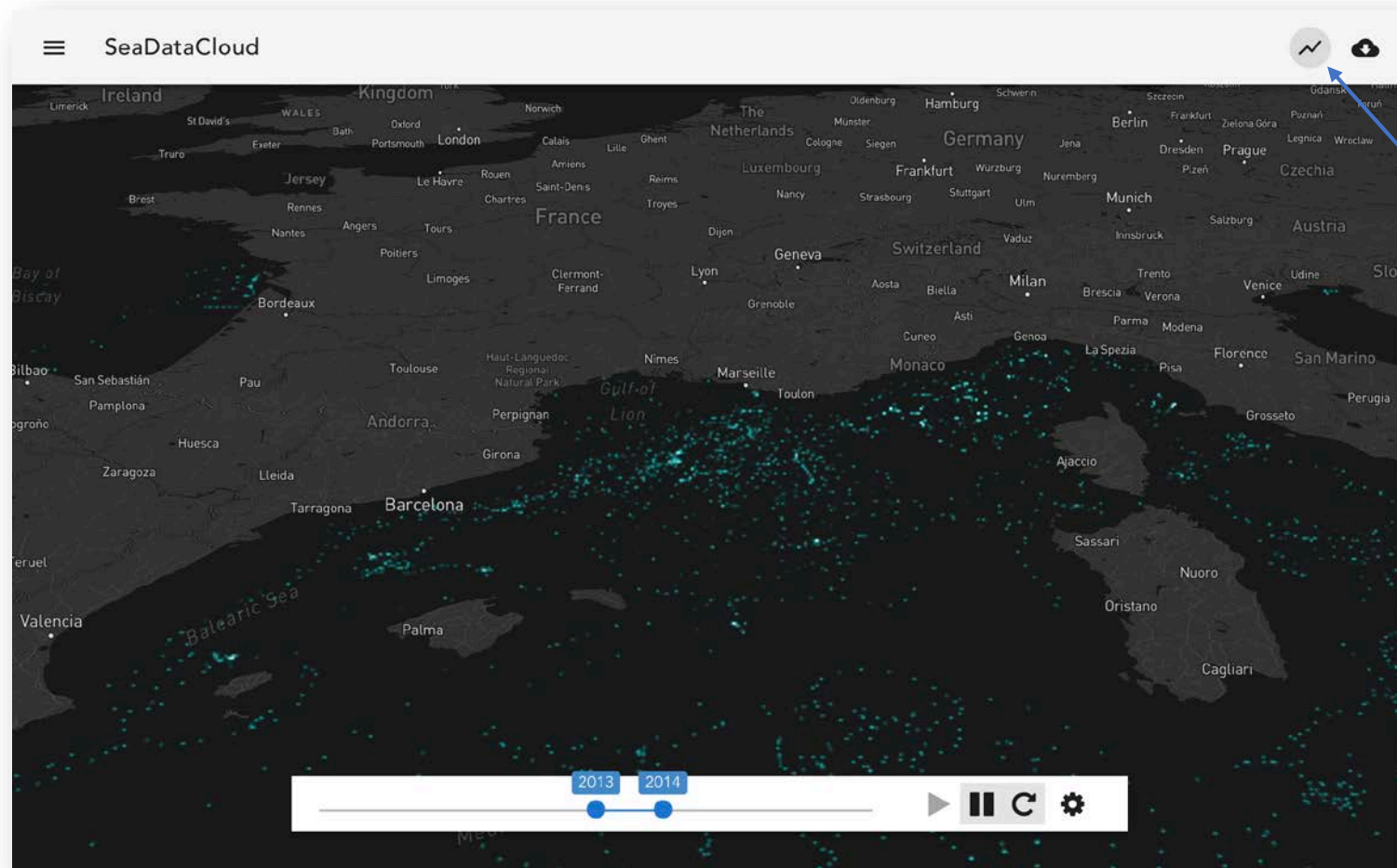


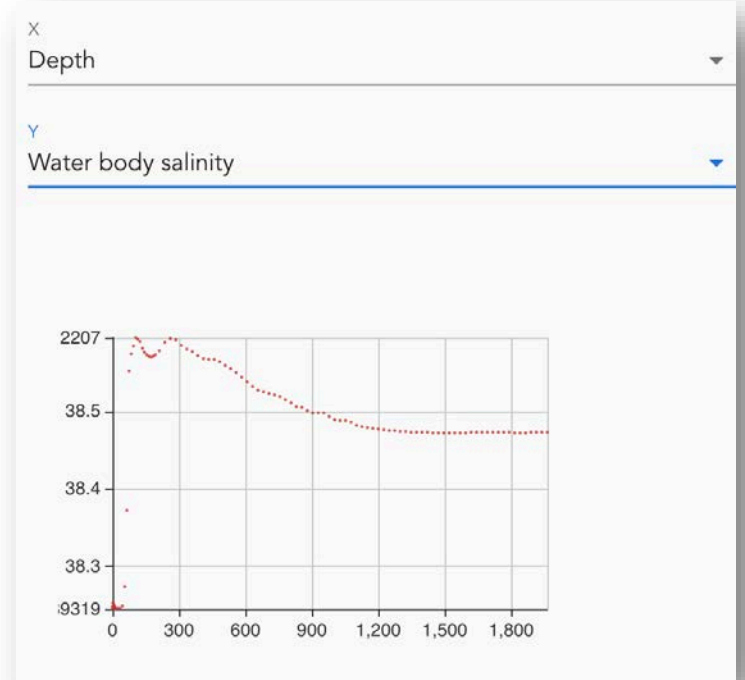
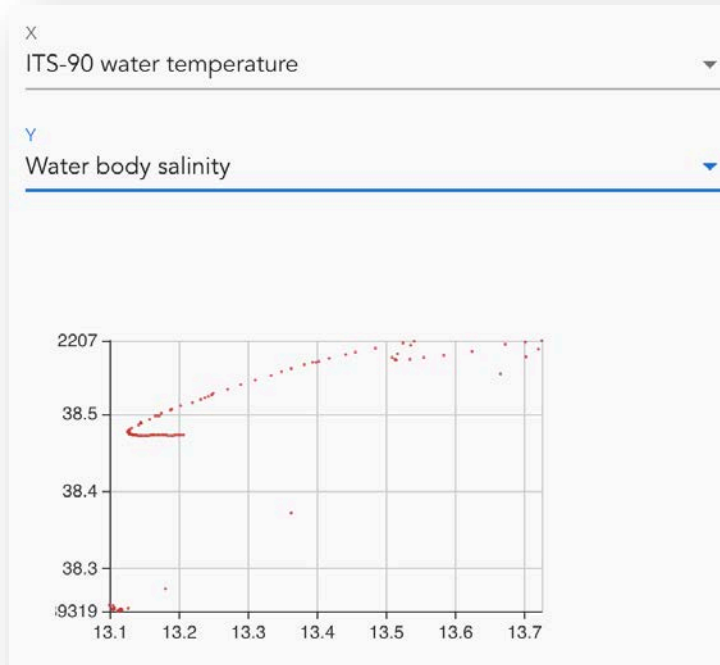
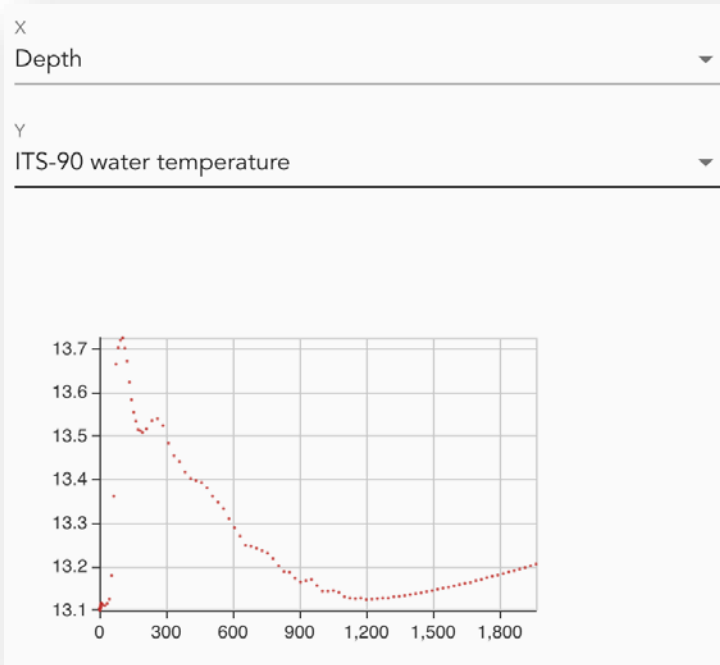
Animation

- Play
- Pause
- Configure



Open the chart side bar





Example charts

Questions &
Feedback

