Generating polygons with AIS data by the Machine Learning group

Justin McGurk and Gabriel Fuentes

Central Statistics Office (Ireland) and Norwegian School of Economics

An Phríomh-Oifig Staidrimh

Central Statistics Office

NHH

Introduction

Our group aims at producing cutting edge algorithms for the automatic generation of maritime polygons while promoting capacity building to our members and future users

Polygons

- Polygons are important features of spatial search

- For Automatic Identification Service (AIS) data they are critical to reduce the search space of a large data pool

- Also important to recognize the wherabouts of a vessel (e.g., a stopped vessel within a polygon bounding a berth is very likely a moored vessel)
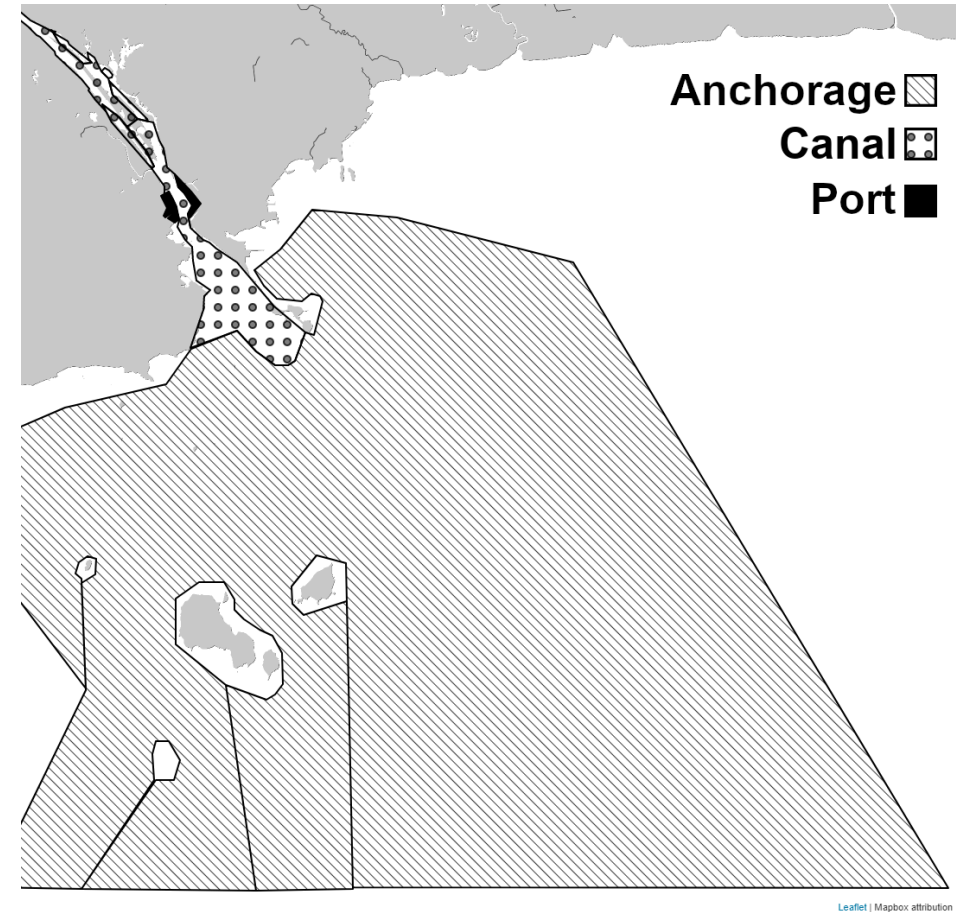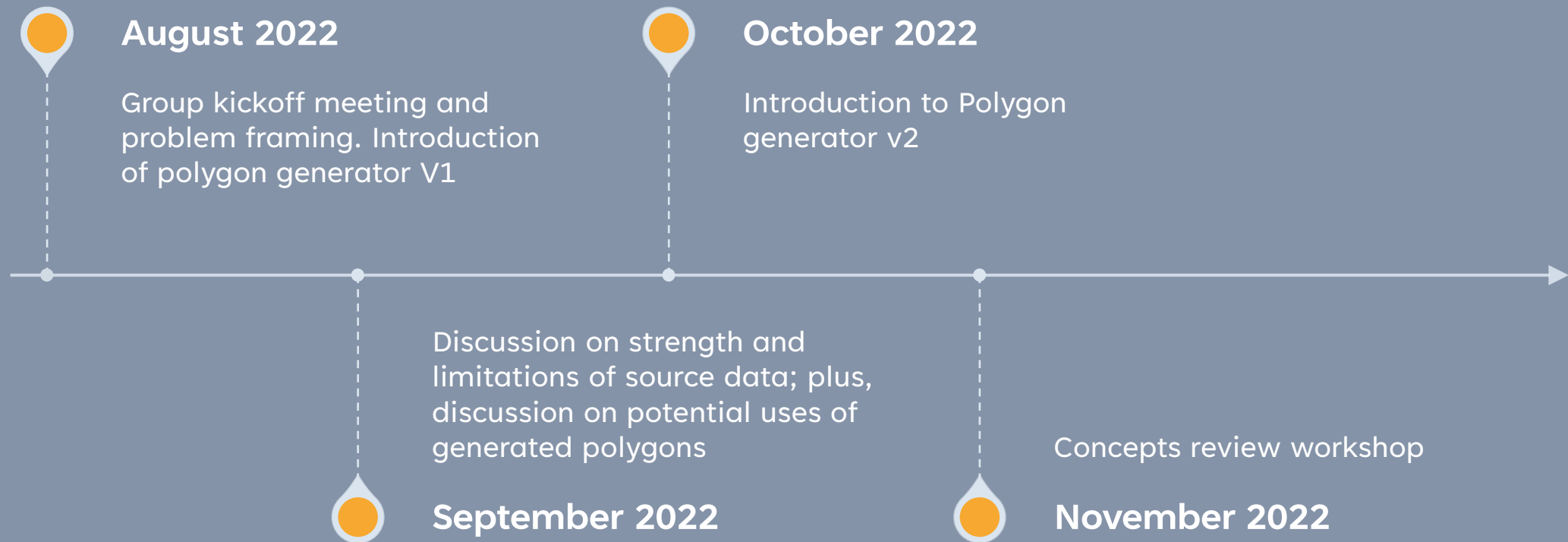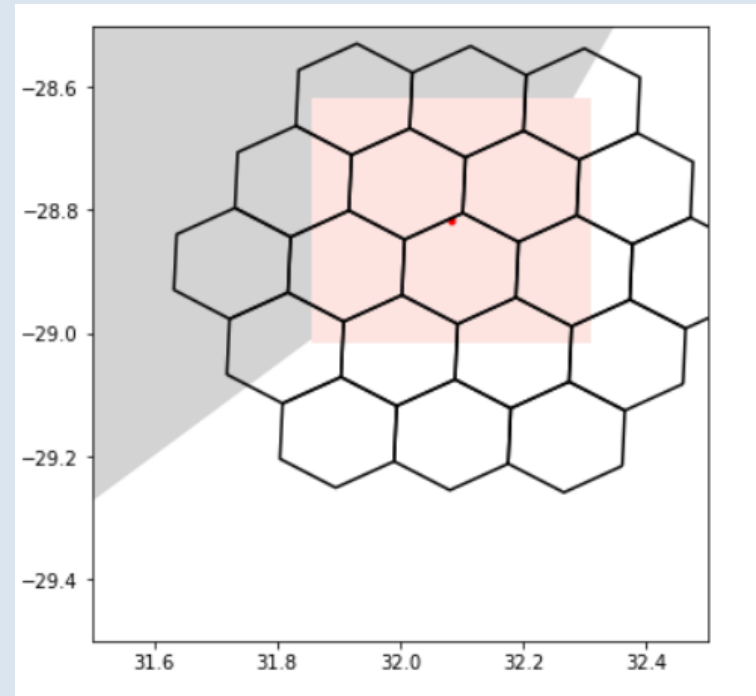
Problem statement

- A common practice is to build them manually. A time consuming task.

- For small areas it pays off as you could ensure high accuracy.

- Many applications need to have a larger pool of polygons (e.g. all world ports). A manual input is very difficul to achieve.

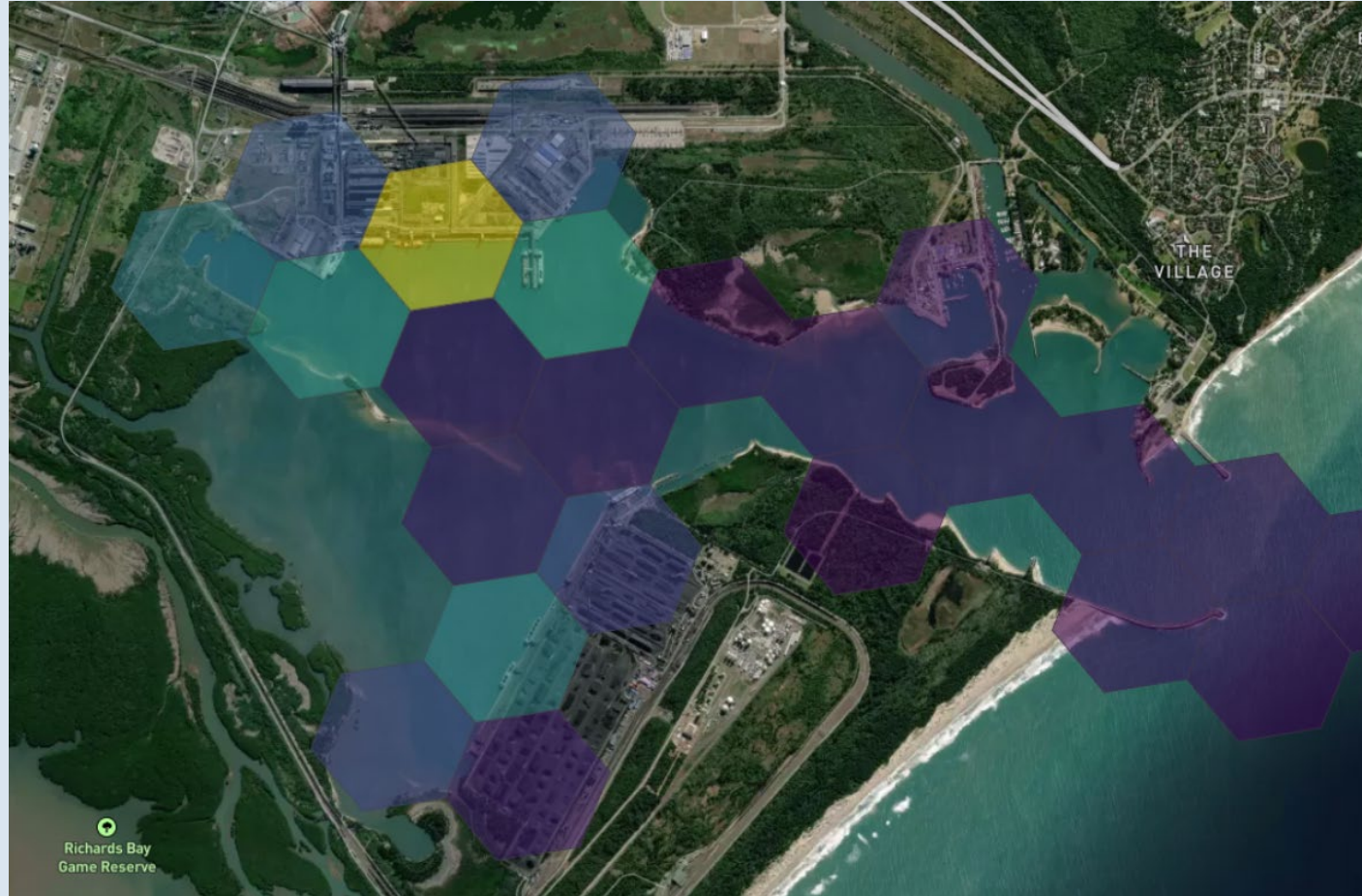- … and as detailed as recognizing individual berths, anchorage (waiting areas), etc.

Timeline

August 2022

Group kickoff meeting and problem framing. Introduction of polygon generator V1

October 2022

Introduction to Polygon generator v2

Discussion on strength and limitations of source data; plus, discussion on potential uses of generated polygons

September 2022

Concepts review workshop

November 2022

Our attempt

Projection:
Africa Albers Equal Area Conic
12 Nautical Mile Geographic
Bounding Boxes

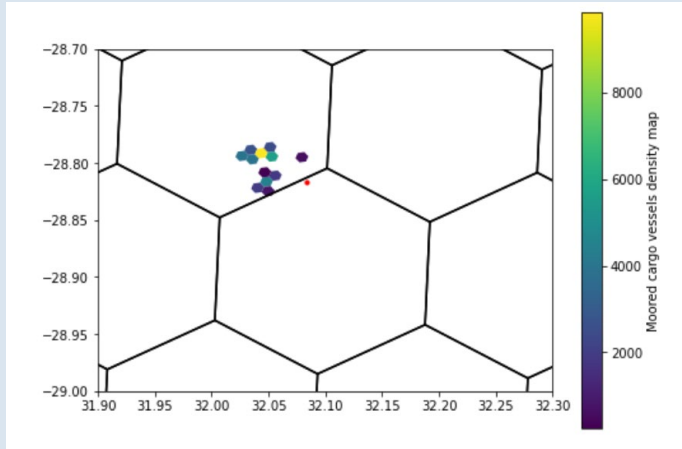Esri South Africa, Esri, HERE, Garmin, Foursquare,
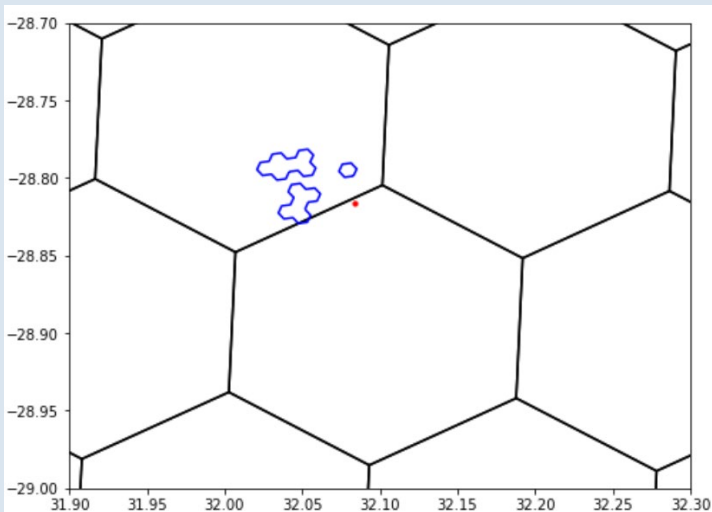FAO, METI/NASA, USGS

Our attempt

Our attempt

Challenges

- We recognized that capacity building was as important as the algorithm development

- Our approaches have not used any M/L model. More on that on the next months

- The algorithms should be tested against practical issues. For that we need their use in different case studies

Thank you

gabriel.fuentes@nhh.no

justin.mcgurk@cso.ie