LAGRANGIAN OCEAN SEARCH TARGETS

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National Sea Rescue Institute

2017 Rescue Stats

1 050

Rescue Operations

1 224

People Rescued

21

Animals Rescued

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SEARCH AND RESCUE TECHNIQUES

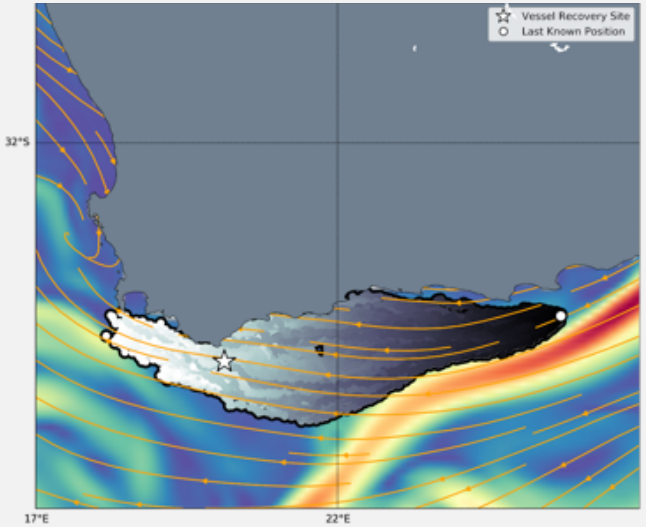
OLD SCHOOL

Uses prior knowledge of search and rescue and ocean conditions

Relies on:

- Local Observations
- Wind Guru
- Port authorities

Calculations done on a map using pencil and a compass



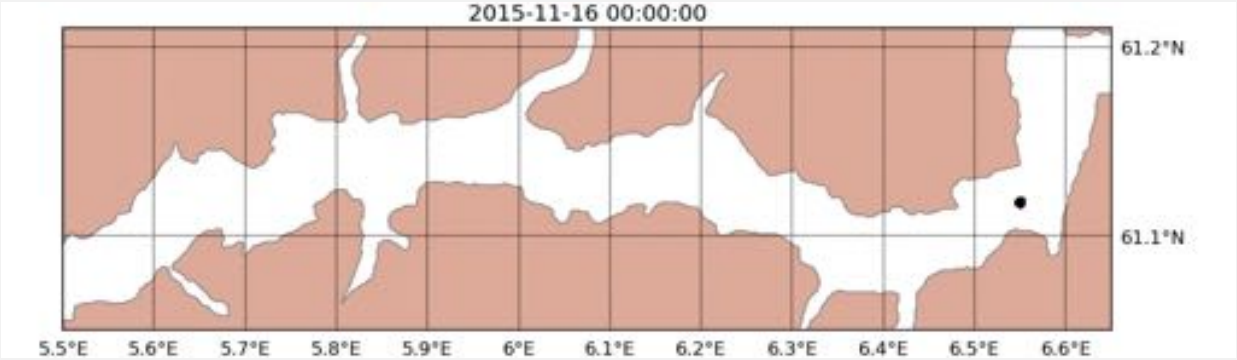
NEW SCHOOL

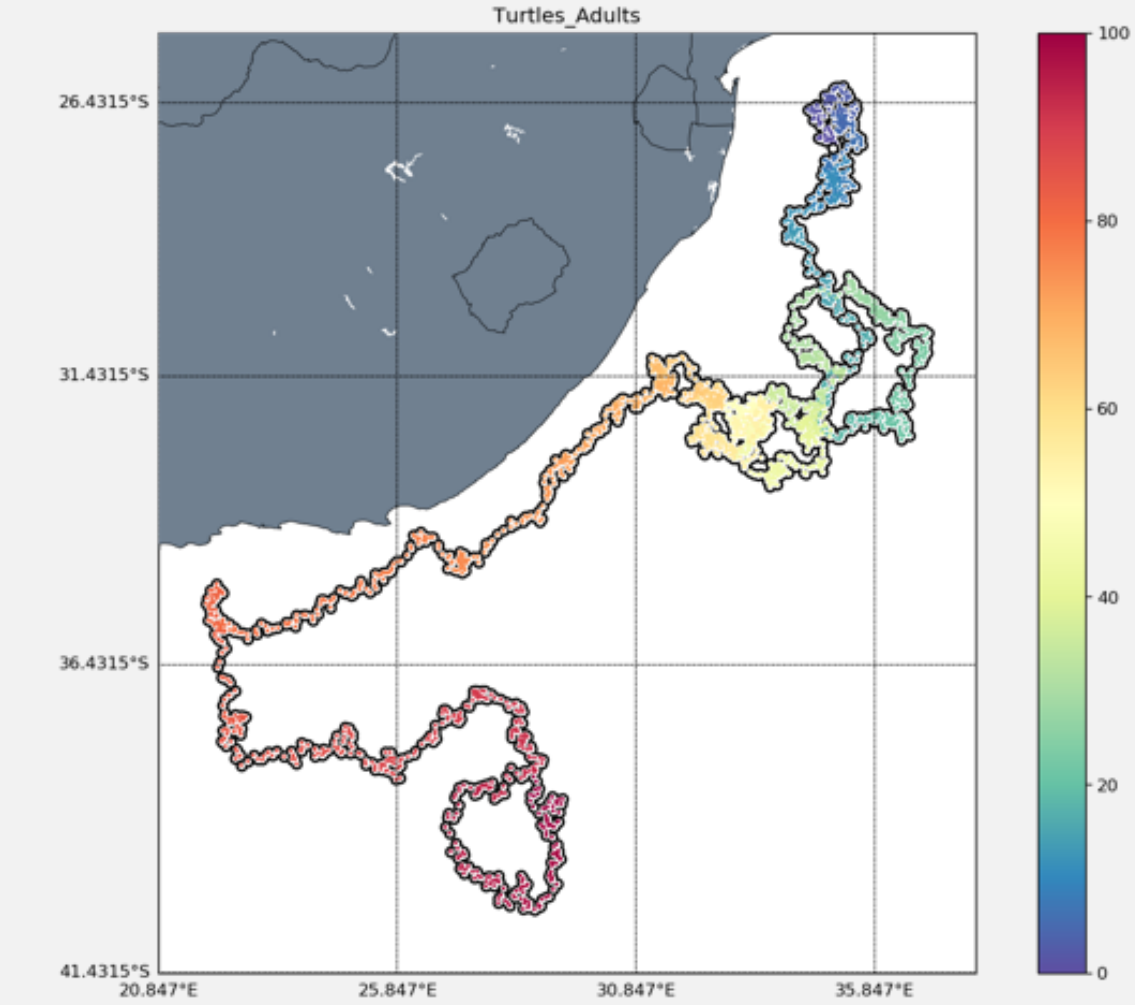
Optimisation of old school techniques:

- Increase efficiency and accuracy

Particle Trajectory Modelling:

- Leeway Method
- OpenDrift
- LOST at Sea





PARTICLE TRAJECTORY MODELLING

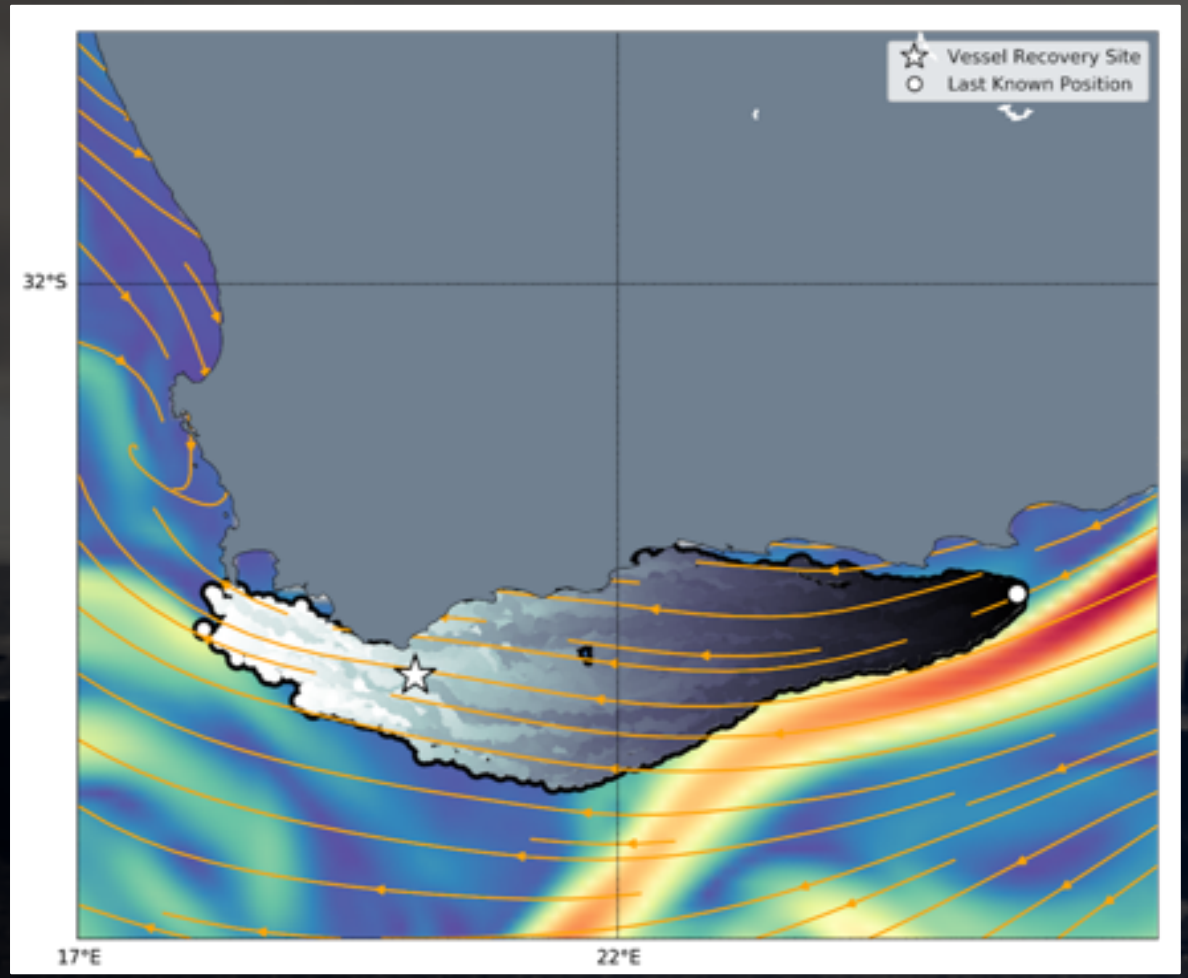
- Observations of virtual particles within fluids
- Lagrangian ocean analysis
- OpenDrift Leeway
- Probably a Really Computationally Efficient Lagrangian Simulator (PARCELS)

OBJECTIVES OF PARTICLE TRAJECTORY MODELLING

IN SEARCH AND RESCUE APPLICATIONS

SCIENTIFIC USE CASES

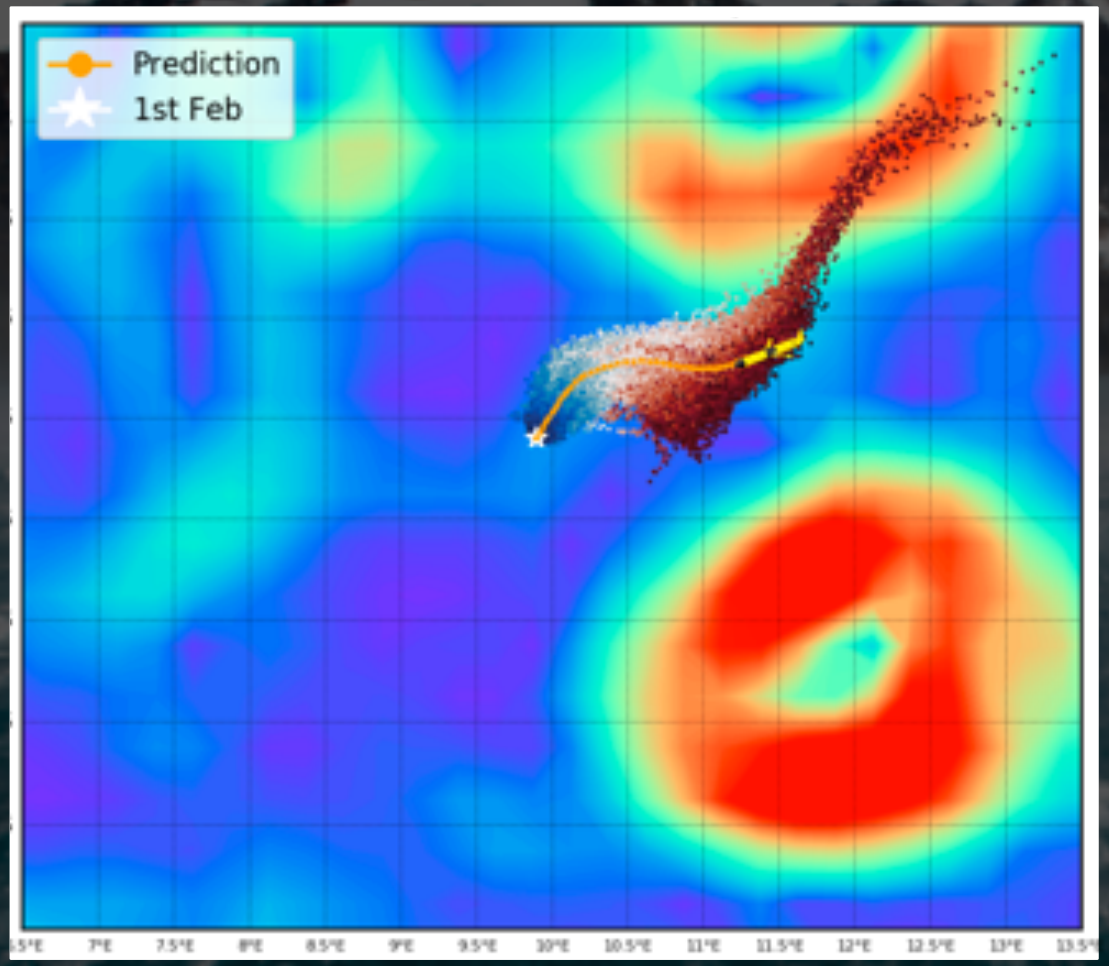
CAPSIZED CATAMARAN



- 18th January 2016
- Southern coast of South Africa
- Found 5 days later off Cape Agulhas
- First application of the LOST particle trajectory model
- Hart-Davis et al 2018 (a, b)

SCIENTIFIC USE CASES

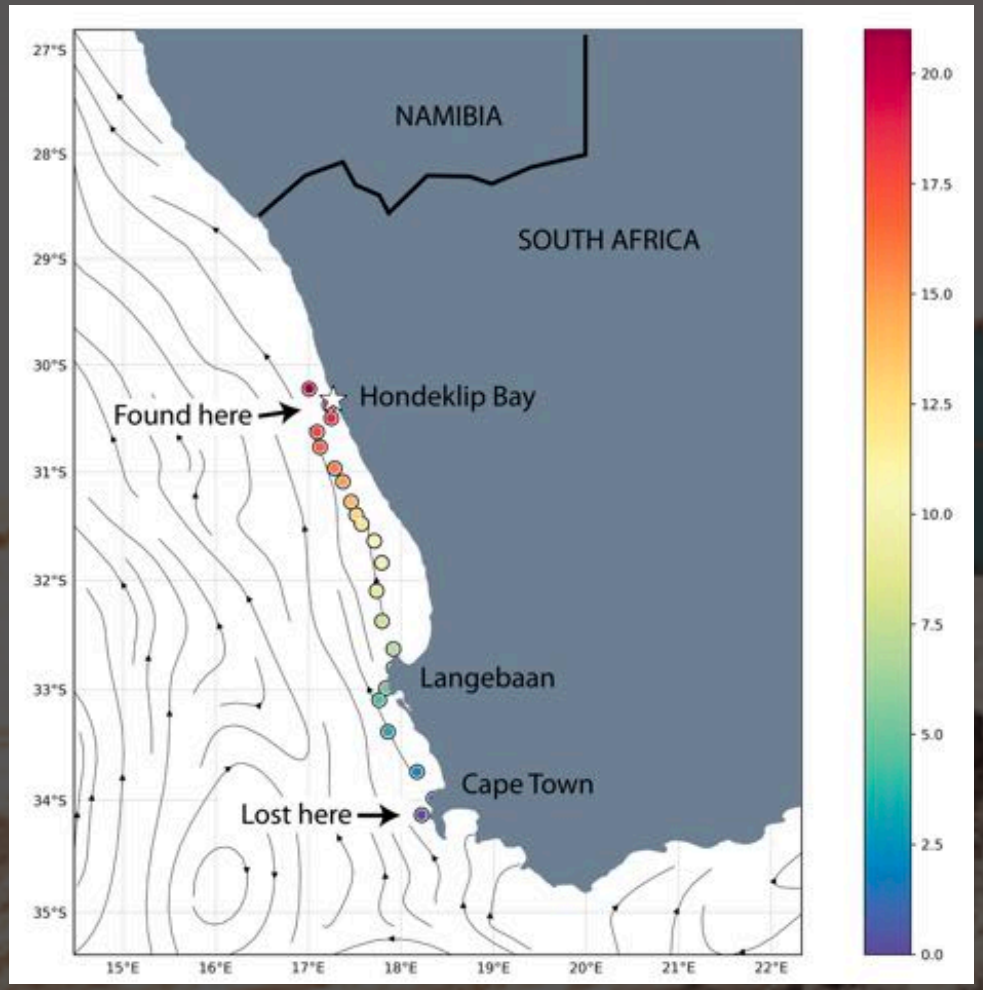
BROKEN GLIDER



- 1st February 2018
- Southern Ocean
- Collected 12 days later by the South African Research Vessel, the Agulhas 2
- Done in real time with forecast data
- Estimation was within 40 meters of recovery site

SCIENTIFIC USE CASES

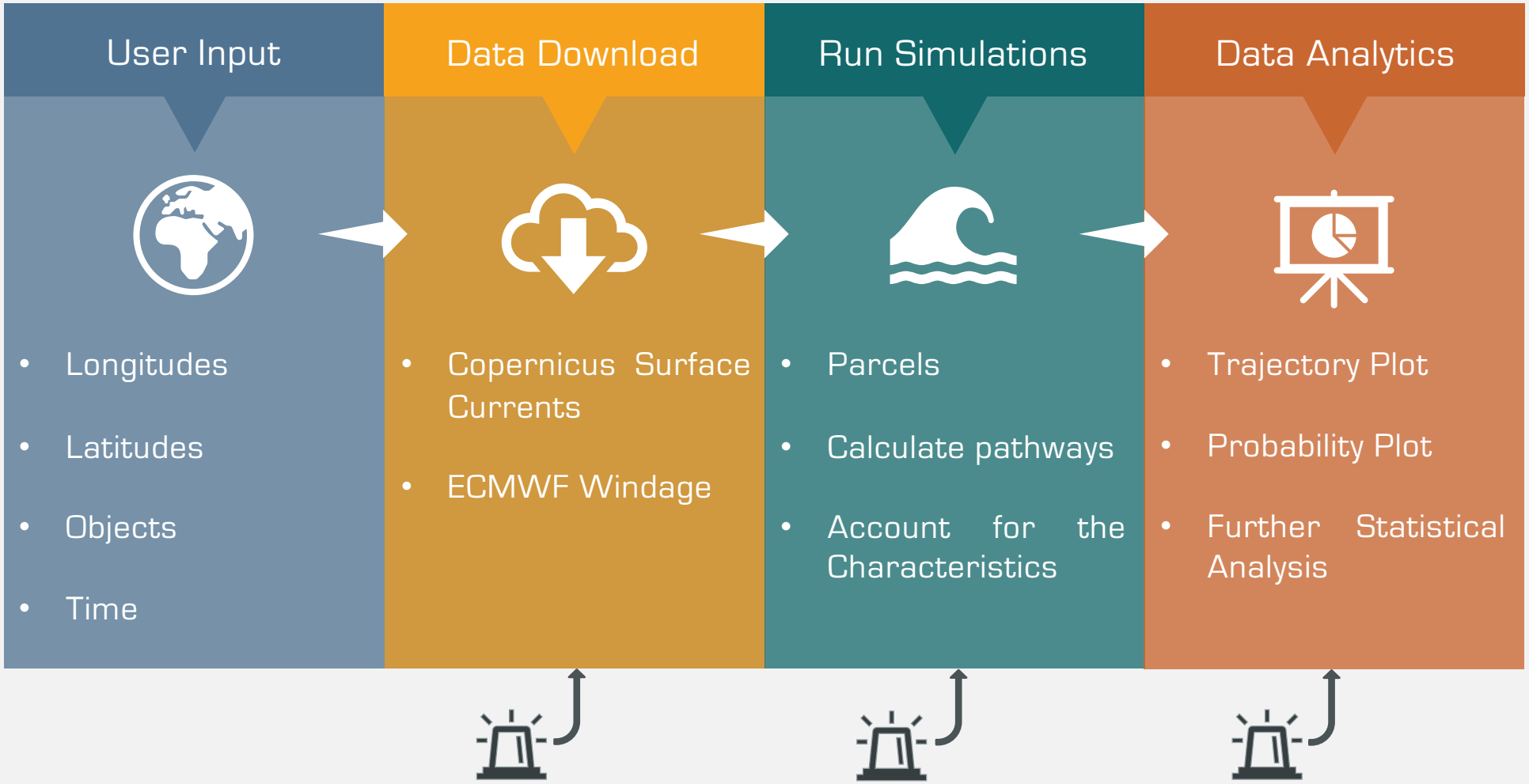
LOST SURFBOARD



- Surfing Incident on 7th August 2018
- Board was lost at Kommetjie, Cape Town
- Found 1,600 km away, two weeks later
- Used full LOST workflow
- https://magicseaweed.com

LOST AT SEA

WORKFLOW



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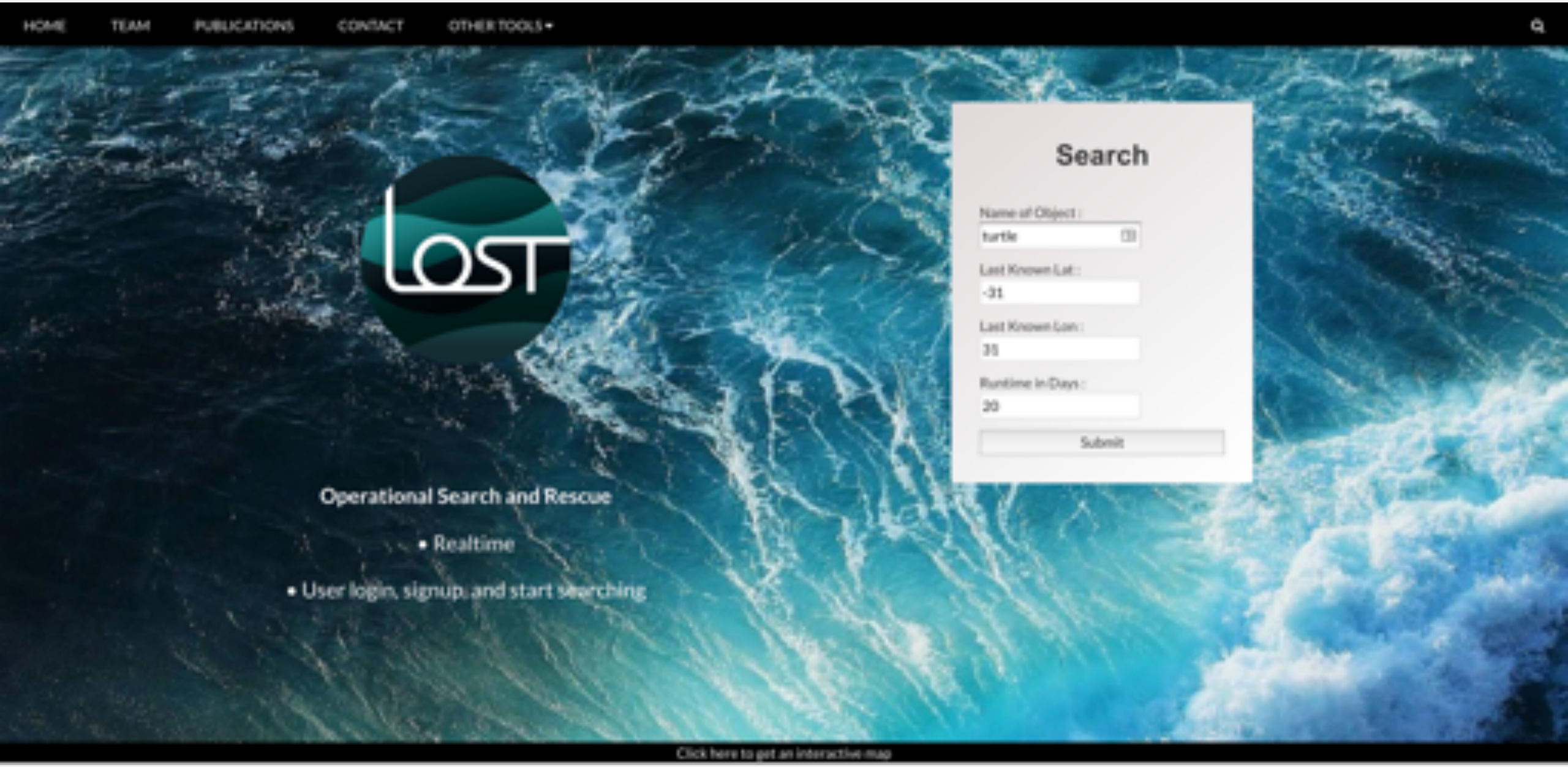
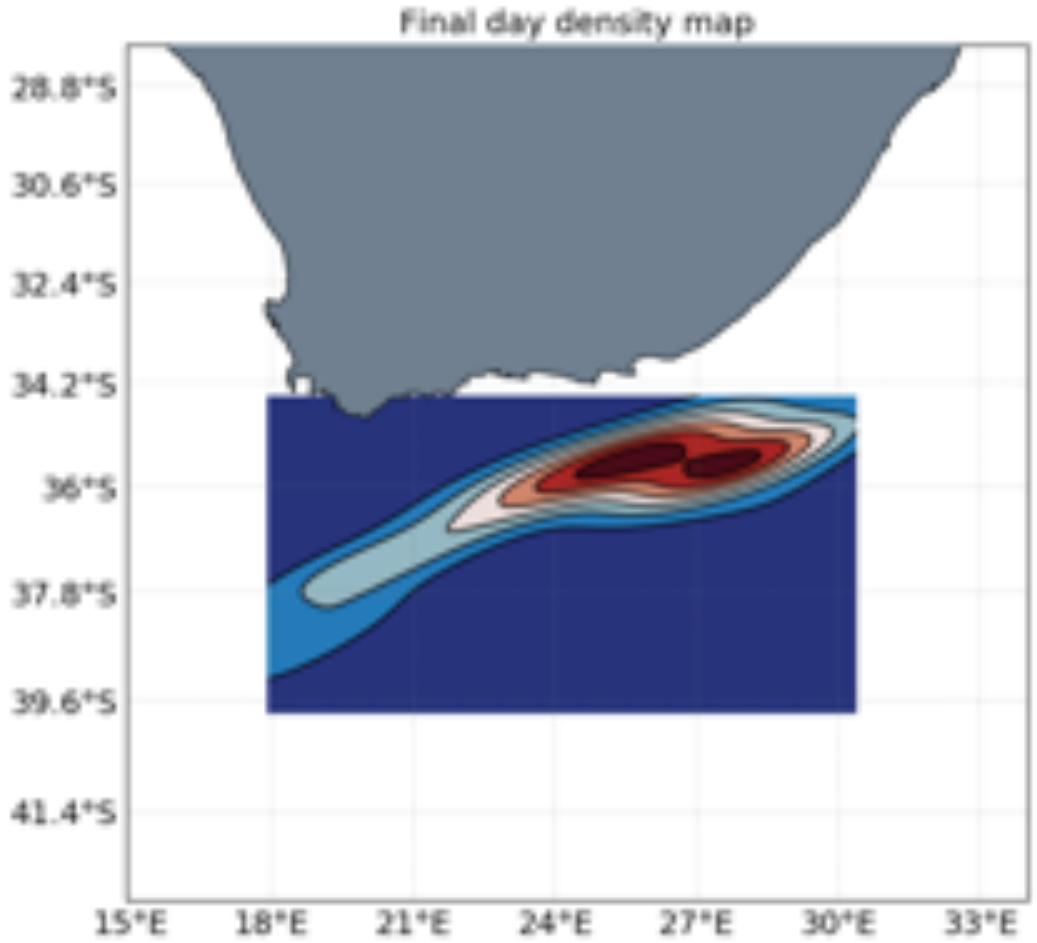
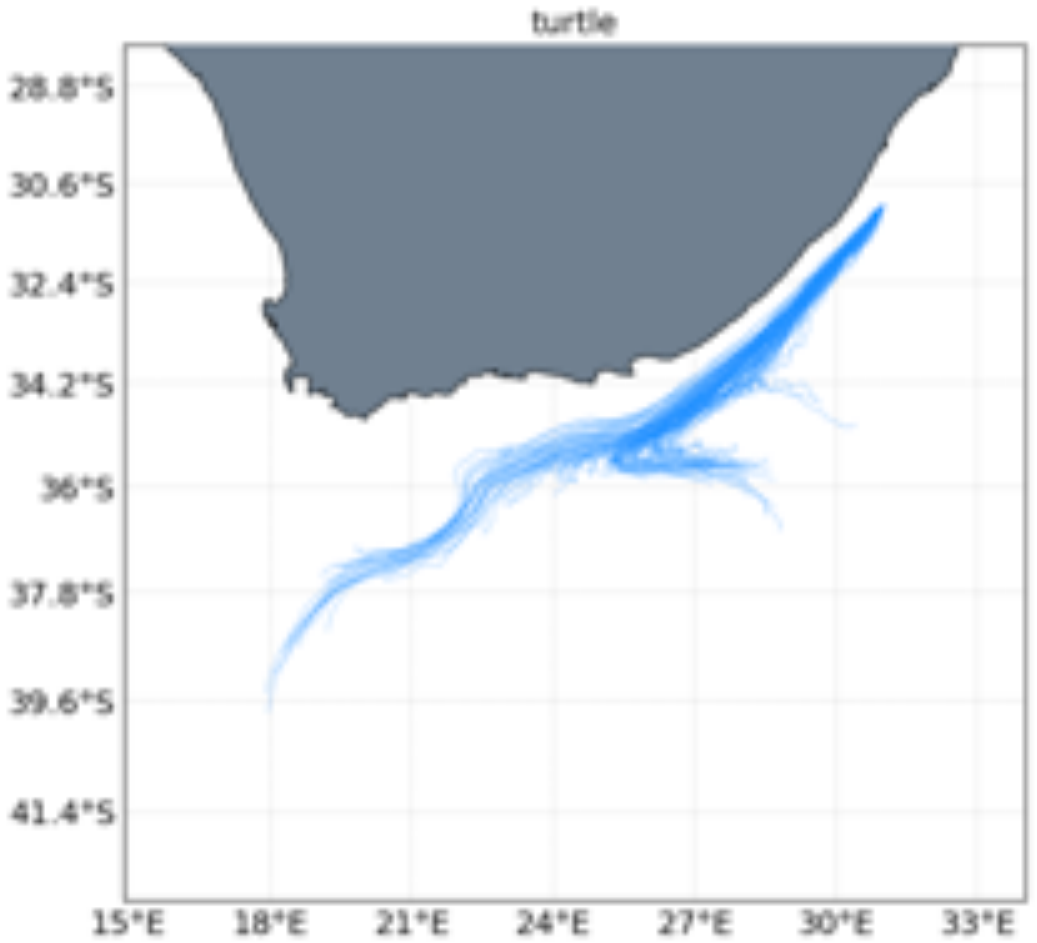
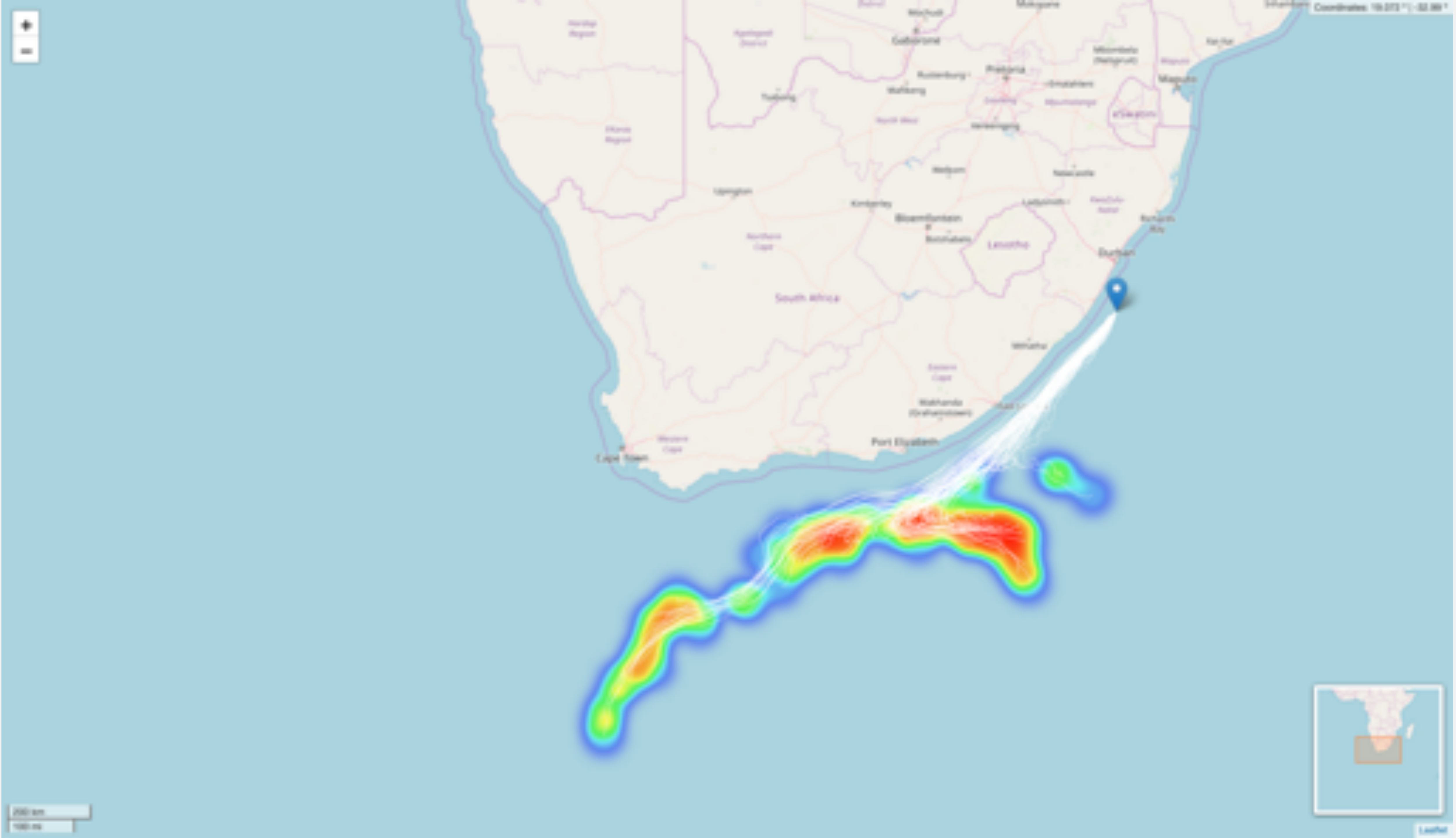
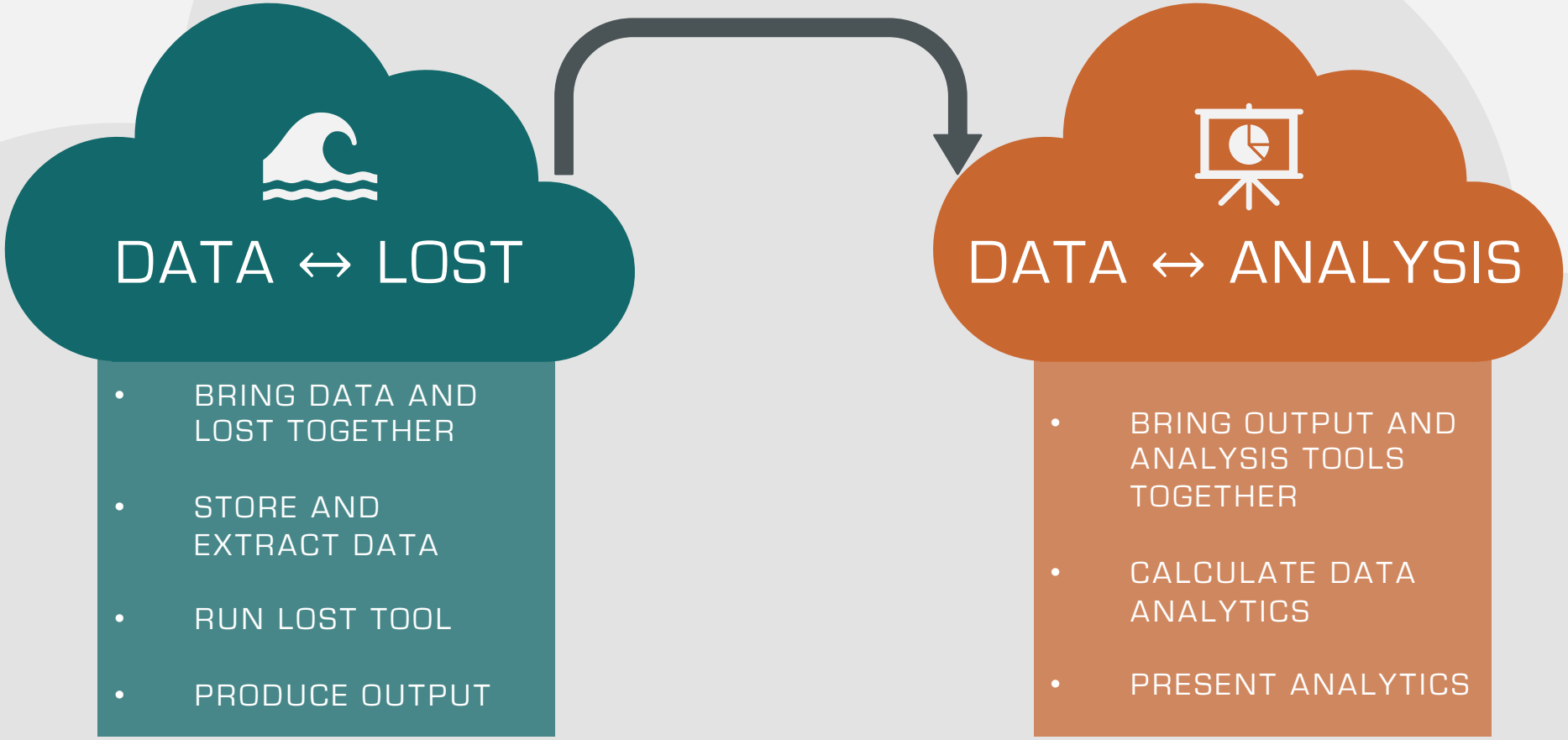

HOME
TEAM
PUBLICATIONS
CONTACT
OTHER TOOLS
LOST
Search
Name of Object :
turtle
Last Known Lat :
-31
Last Known Lon :
31
Runtime in Days :
30
Submit
Operational Search and Rescue
• Realtime
• User login, signup, and start searching
Click here to get an interactive map






Gaborone
Pretoria
Lesotho
Durban
South Africa
Bloemfontein
Kimberley
Cape Town
Port Elizabeth
Leaflet

WORKFLOW OPTIMISATION WITH EGI



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CONCLUSION

- Development of global operational search and rescue tool to provide real-time estimations of objects lost at sea
- Use the EGI capabilities to optimise the efficiency of real-time estimations and to reduce bottlenecks

ANY QUESTIONS?

With thanks:

- Nelson Mandela University
- Nansen-Tutu Center
- South African Earth Observation Network
- EGI Foundation
- Nansen Environmental and Remote Sensing Center