KAPTAN

A smartphone application for mariners

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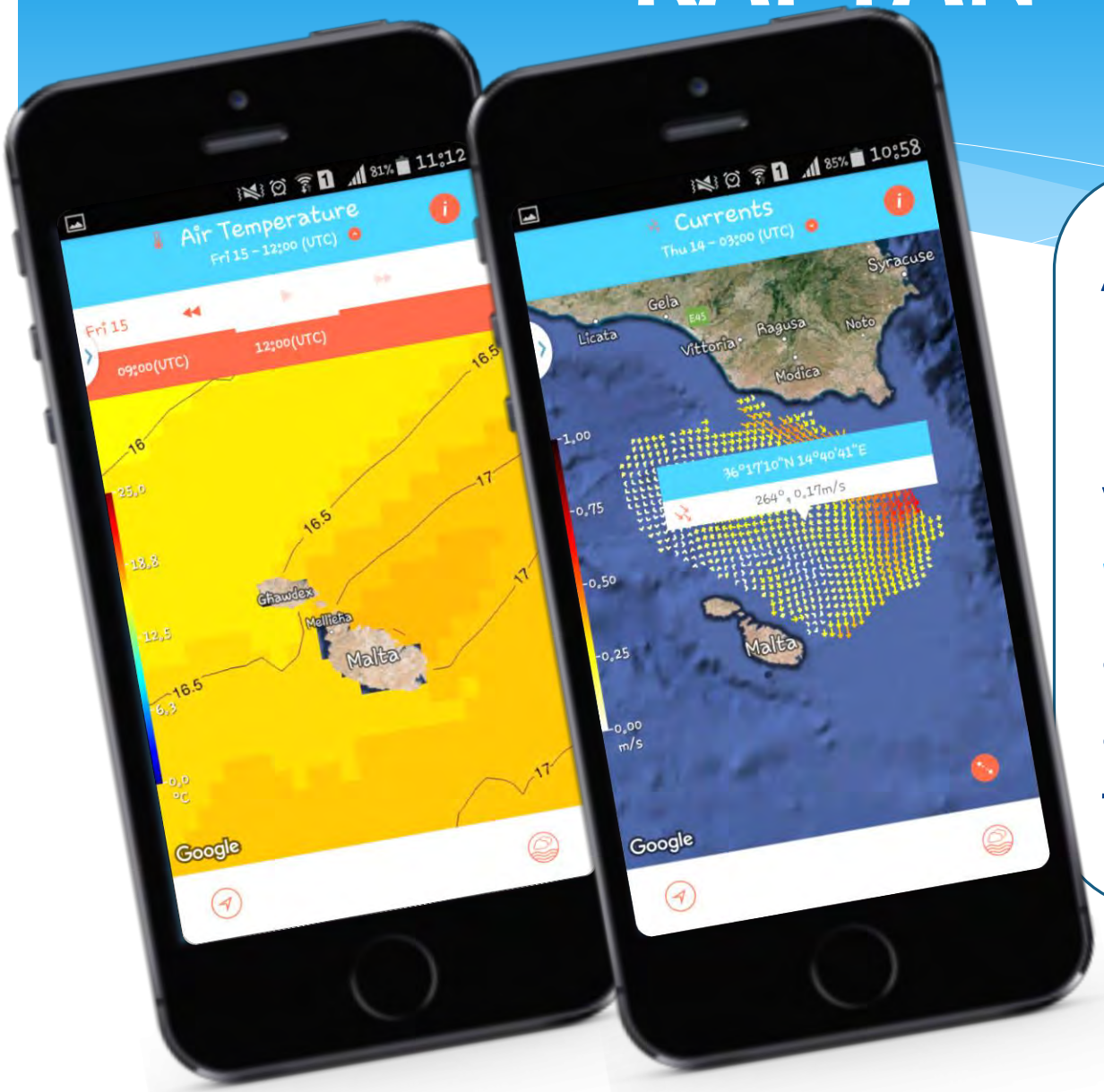
KAPTAN

- Introduction
- Overview
- Data Sources
- Data Extraction
- Data Transmission
- Data Presentation
- Conclusion

CALYPSO Follow On

KAPTAN



A **user-friendly** interface that provides users with **meteo-marine maps** and **point data** at the tip of their fingers.

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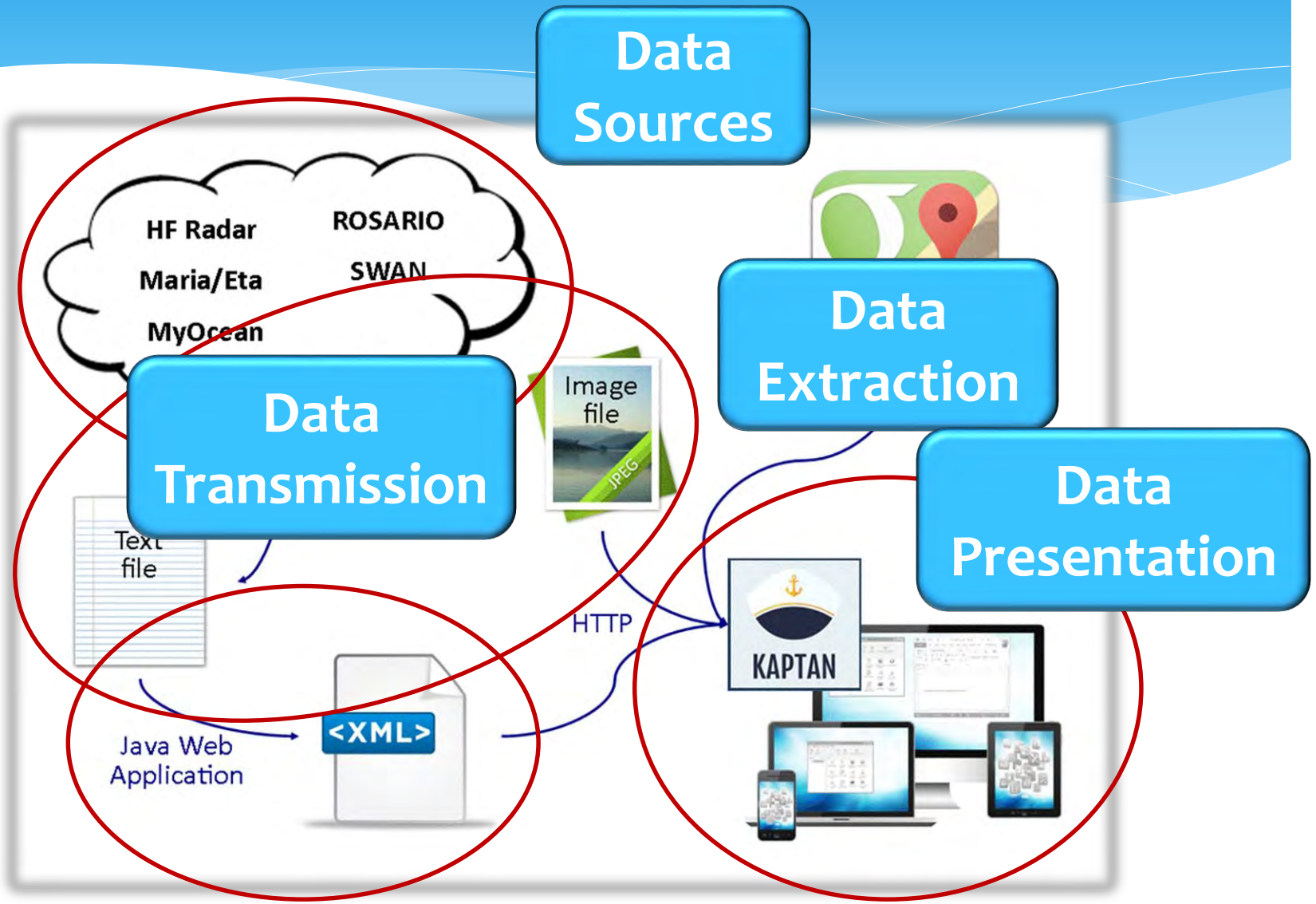
KAPTAN services overview



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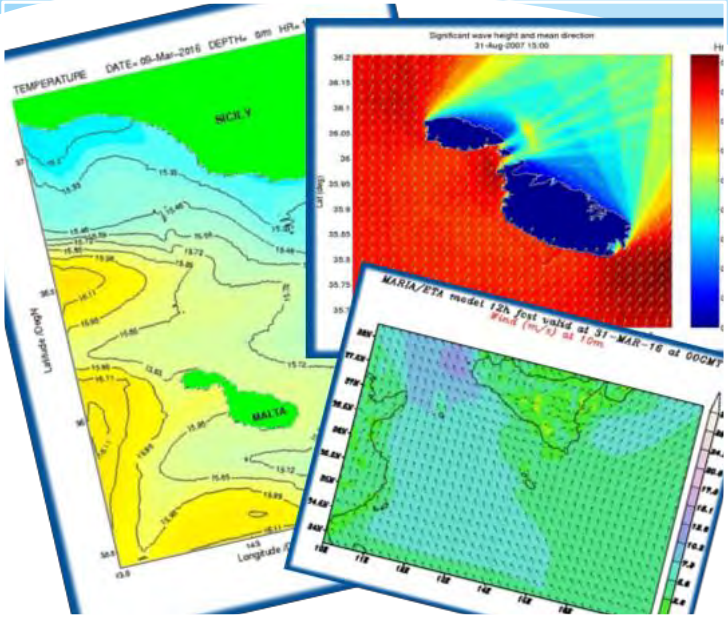
Data Sources



Models

MARIA ETA - atmospheric forecast
SWAN - marine forecast
ROSARIO - marine forecast

Observations

MyOcean satellite data
CALYPSO HF radar data

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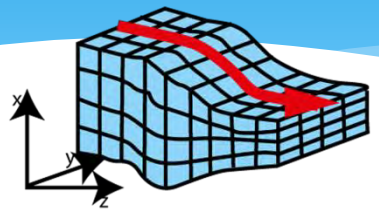
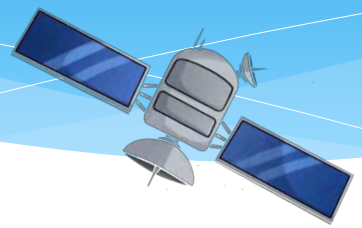
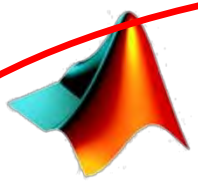
Data Extraction



Models & Observations

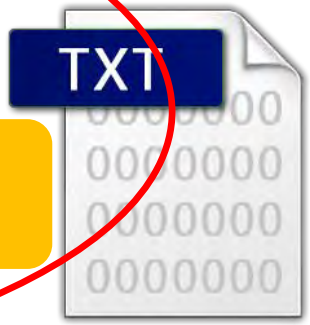


Dedicated Matlab functions



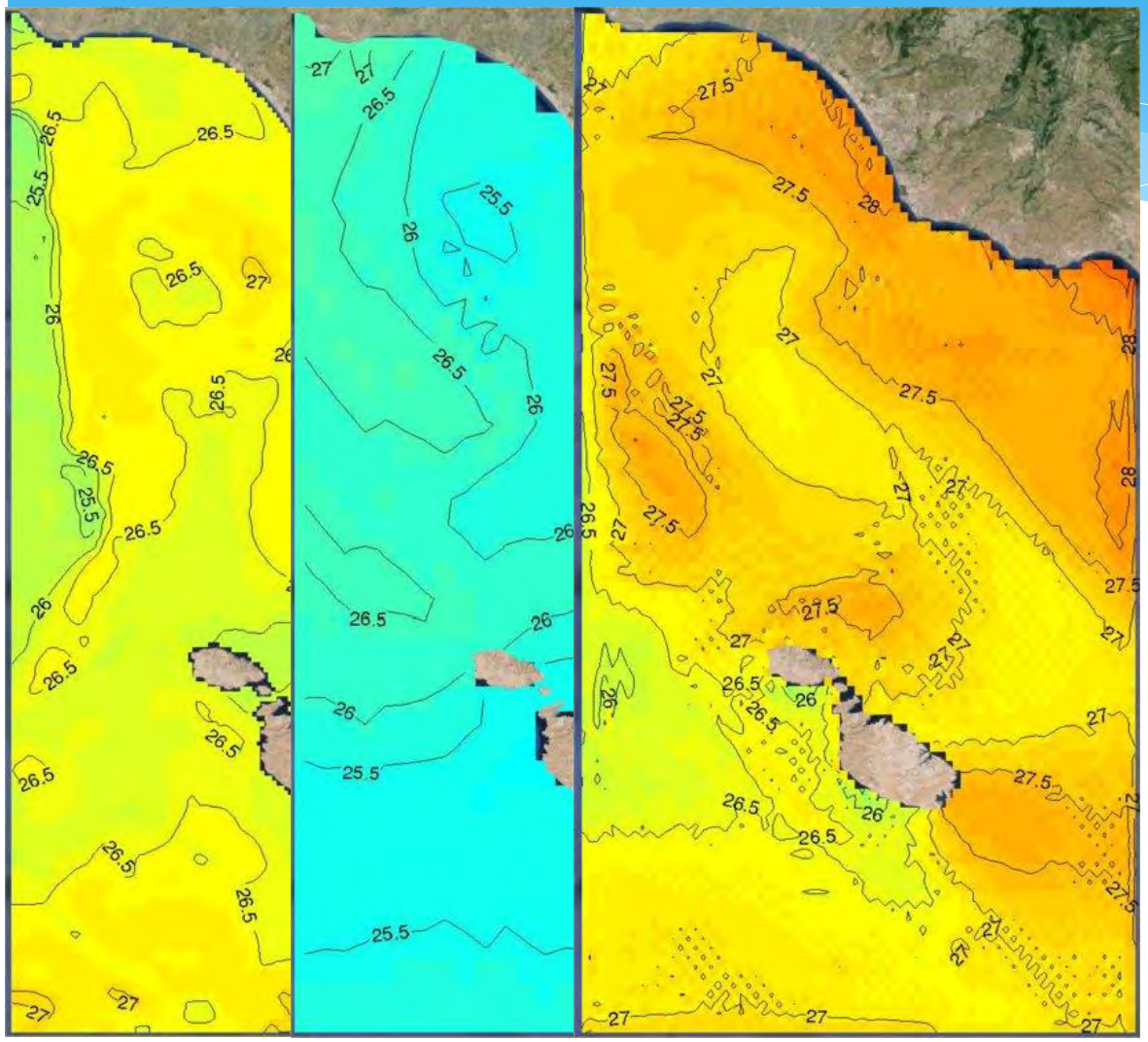
Maps

ASCII files



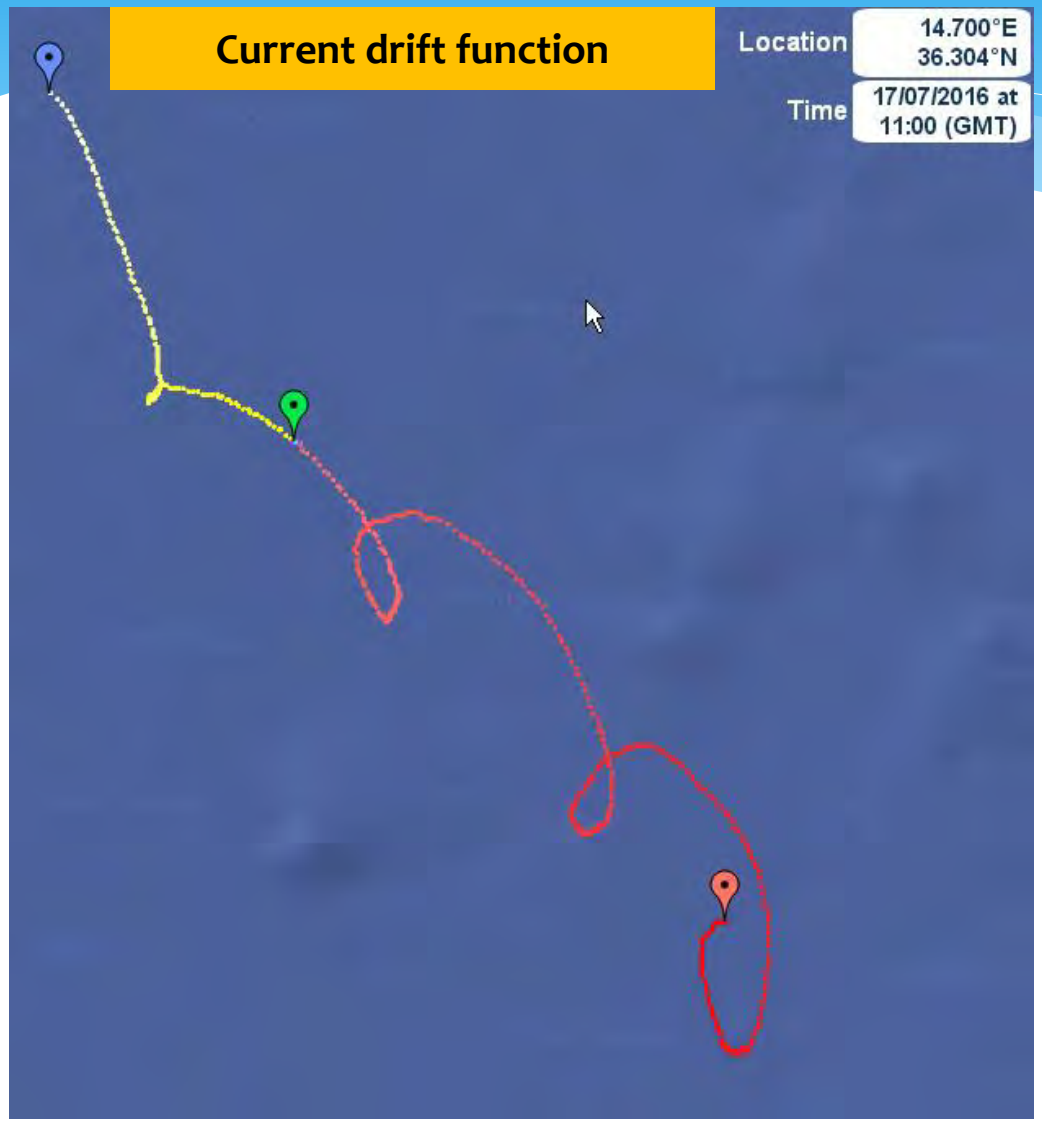
Data Transmission

Data Extraction



- **Matlab functions** come in to visualise the observations and model forecasts;
- **The mapping of** observations and forecast **is done using Google maps.**
- Apart from the maps**, the Matlab functions also generate ASCII files** that are used at the later stage of Data Transmission.

Data Extraction



- **Using HF radar data,** tracks particle's location **up to 72 hours prior and up to 12 hour past the selected time;**
- calculates **particle's location at every 10 minutes intervals;**
- 10 minute current fields are generated by interpolating two closest hourly current fields;
- based on bilinear interpolation in space and 4^{th} order Runge-Kutta integration scheme;
- the scheme does not consider diffusion effect.

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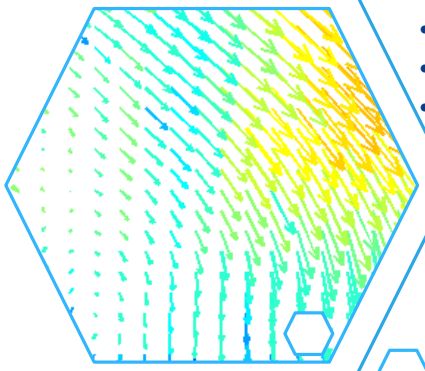
Data Transmission

* Implemented as a Java web application;
* Physically located as a JAR file on *oceania* server;
* Can be consumed by sending HTTP request to: *http://oceania.research.um.edu.mt:8080/CalypsoWebServices/GetCalypsoData?wsdl*

Data Transmission



Atmospheric conditions

- getAirTemperature
- getWinds
- getPrecipitation
- getAirPressure

Sea surface currents

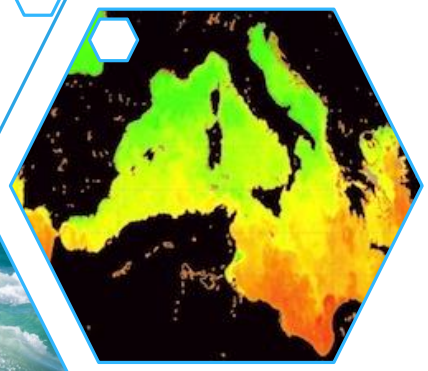
- getCurrents
- getTransect
- getDrift

Waves

- getWaveHeight
- getWaveDirection
- getPeakPeriod
- getMeanPeriod

Sea surface temperature

- getSSTNowcast
- getSSTForecast



Data Transmission

Input parameters:

* **date / time** for which data is being requested;
* **latitude** and **longitude** (for transect and drift);
* **direction in time** (in the case of drift).

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Client device

XM

Output data classes:

* ***Scalar*** – **timeDelta**, **latitude**, **longitude** and **scalarValue**.
* ***Vector*** – **timeDelta**, **latitude**, **longitude**, **u**, **v** and **r**, **g** and **b** colour values.

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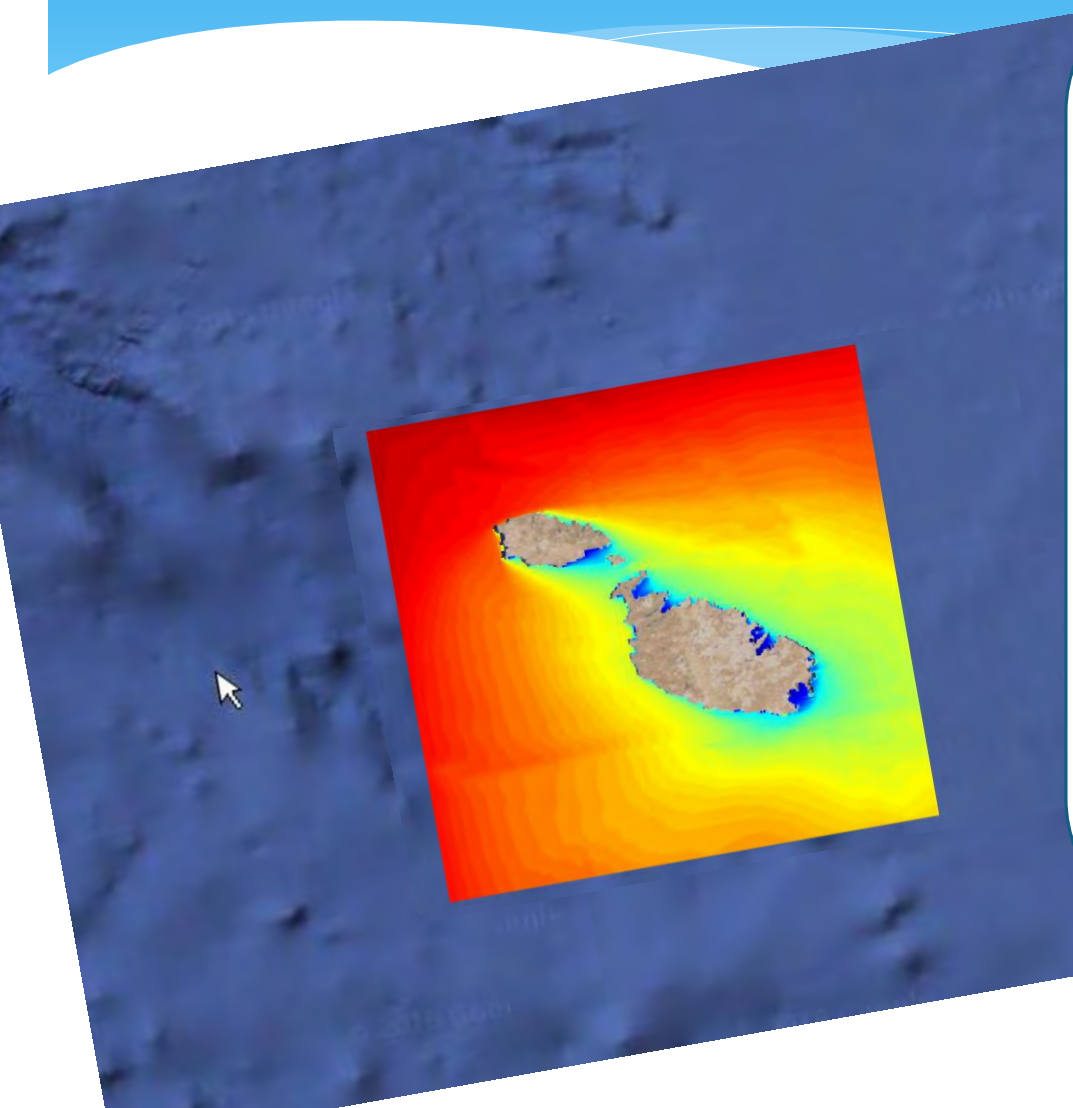
Data Presentation

* Client side interface developed using **Google Maps API**:

  https://developers.google.com/maps/

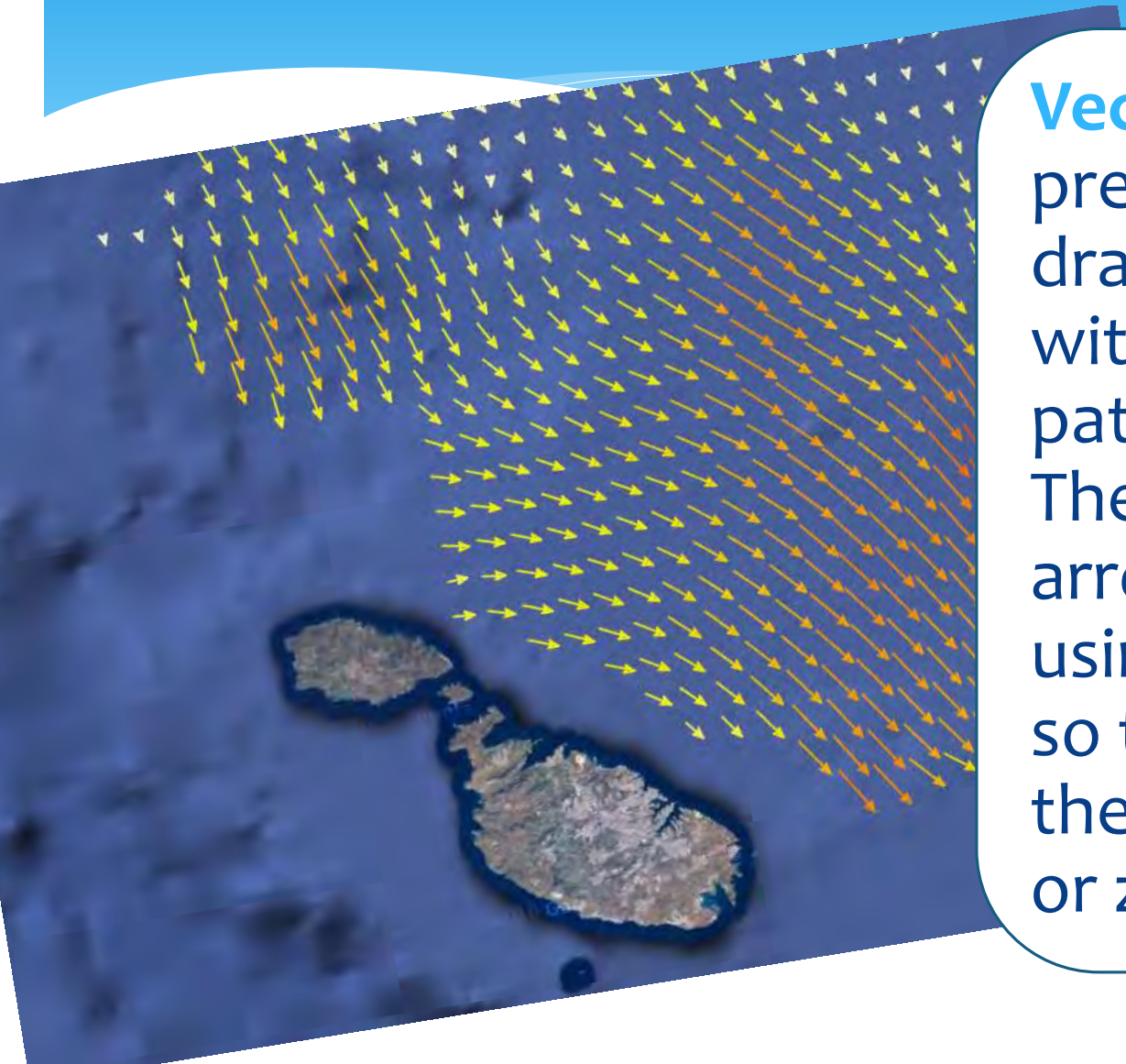
* APIs are available for **Android**, **iOS**, web browsers and via HTTP web services

Data Presentation



Scalar data is presented as a **colour map** super-imposed on a Google map.
The overlay is **tied to coordinates**, so it moves when the map is dragged or zoomed.

Data Presentation



Vector data is presented by drawing **polylines** with predefined paths for arrows. The ends of the arrows are defined using **coordinates** so they move when the map is dragged or zoomed.

Data Presentation

Drift data is presented by drawing **circles** for each point. The centre of each circle is defined using **coordinates** while the radius is in metres.

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Conclusion

In its first few months, **KAPTAN** has been well received by users. It is one of the **most downloaded** weather apps in Malta on Apple App Store and has received **5 star reviews** on Google Play.