

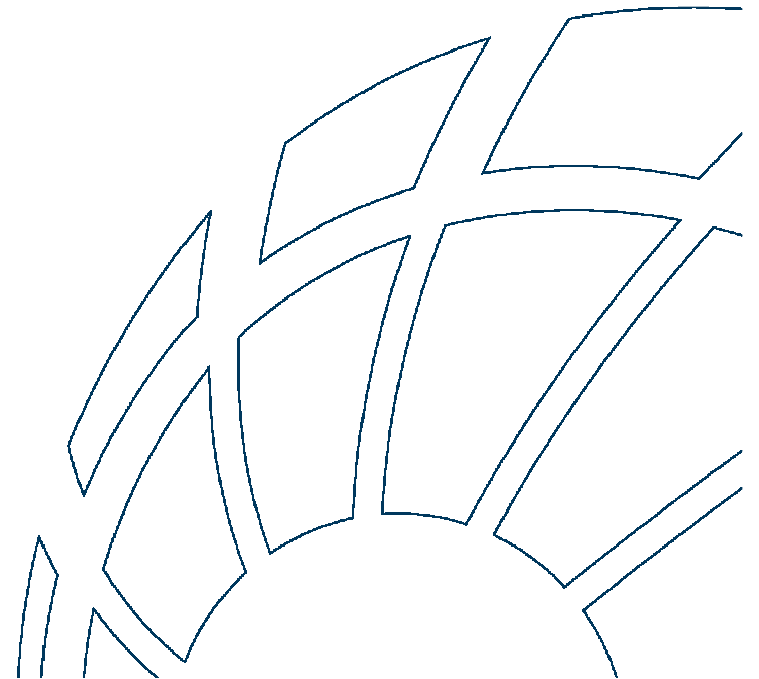


“Where will our knowledge take you?”

Commercial Applications of Satellite Data in the Maritime Industry

Han Wensink

London, 28 January 2009



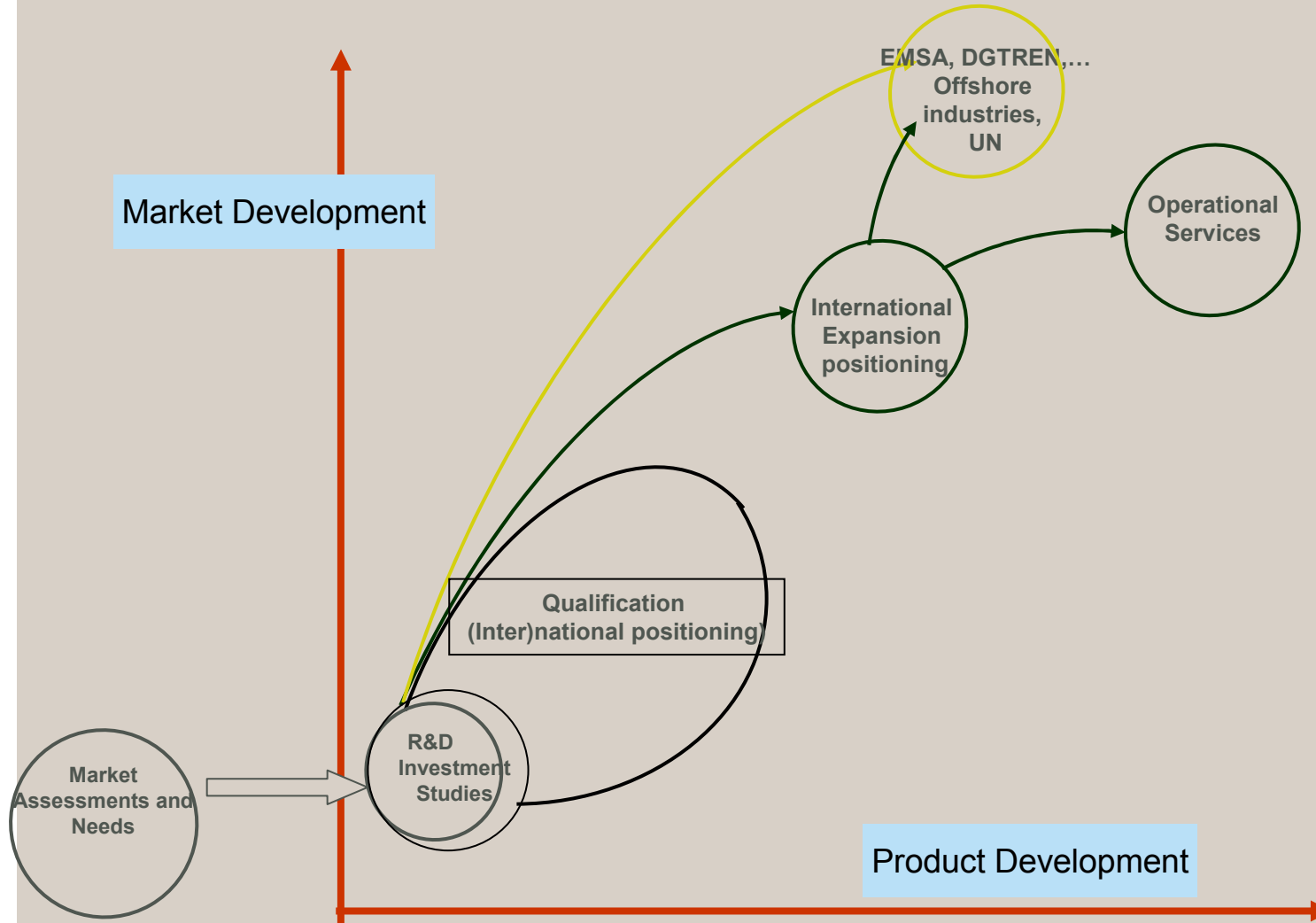
Outline

- Introduction to BMT
- BMT's Strategy for Innovation & Business
- Information Needs
- Examples of Services
- Conclusions

BMT Group Introduction

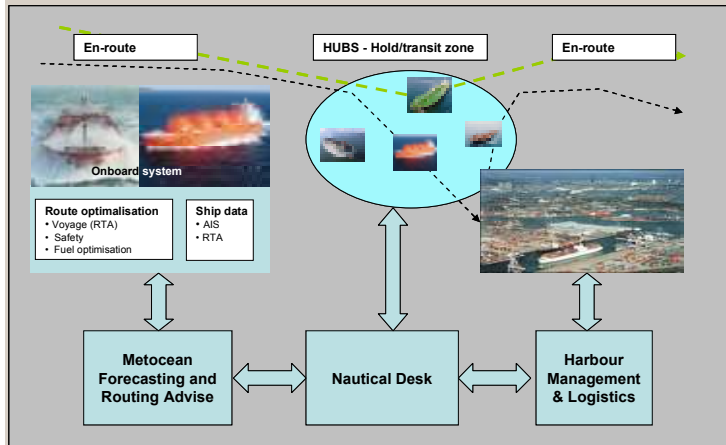
- An international network of subsidiaries providing engineering, design and risk management consultancy
- A wholly independent partner providing customers with access to expertise around the globe
- About 60 offices around the world and over 1200 staff
- Business in
 - **Defence**
 - **Energy & Environment**
 - **Marine Risk and Insurance**
 - **Maritime Transport**
 - **Port and Logistics**
- A heritage of research and technology which drives significant ongoing investment in R&D and development of future talent

Strategy for Innovation



Strategy to qualify and position BMT for future and next generation products and services:
Open source + strong commitment towards (R&D) partners

Information Needs in Maritime Industry



Increasing need for Geo-Metoccean (and Air Quality) conditions all over the world to reduce risk, increase safety and optimize profits: planning & design, operations and forensic investigations

BMT– Developed in house Resources

- Operational Infrastructure of
 - Models
 - Meteorological, Ocean and Coastal
 - Observations
 - QA Satellite data over 20 years
 - Web services
 - Software analysis tools



Online Services for Marine Information and Decision Support



For the offshore and coastal engineering sector to assess downtime, workability conditions, weather windows and design of structures.



For the insurance sector and shipping industry to support voyage planning and design.



For governmental, environmental, and coastal engineering sectors to determine allowable limits and warn of impending levels that may be critical to operations. E.g. coastal fisheries.



For depth reduction, siting and planning of operations critical for currents and sea level



BMT ARGOS

Services available 24x7, easy access through individual web portals

Statistics - Route Planning and Design

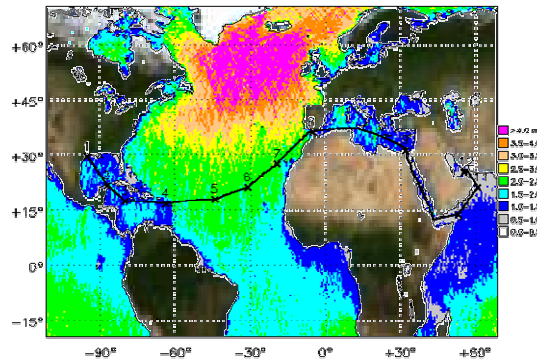
Routing advice based on:

- Wind
- Waves

Using state of the art wave models calibrated with satellite data.

Services mainly used by:

- insurance companies
- oil companies
- warranty surveyors



	Prob. of exc. (%)	Travel duration (days)	Exc. duration (days)	Exc. fraction (%)
voyage	5	24.47	0.006438	0.02632
segment #1	2.545	1.125	0.003217	0.286
segment #2	1.156	1.125	0.001452	0.1291
segment #3	0.622	1.125	0.000779	0.06927
segment #4	0.5579	1.125	0.000699	0.06214
segment #5	0.1573	1.125	0.000197	0.01748
segment #6	0.03859	1.125	4.82E-05	0.004289
segment #7	0.01371	1.125	1.71E-05	0.001524
segment #8	0.01159	1.125	1.45E-05	0.001288
segment #9	0.003462	1.125	4.33E-06	0.000385
segment #10	0.002188	1.125	2.74E-06	0.000243

Significant wave height value exceeded with the	
Significant wave height (m)	Prob. of exceedance (%)
7	19.31



Globally Available Wind and Wave Forecast Services at any resolution

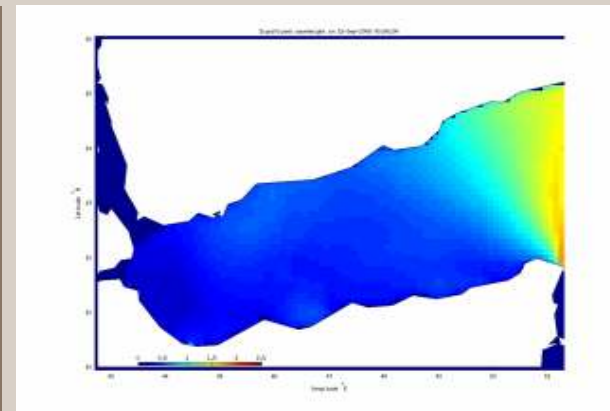
Near shore forecasts – Support to Operations

Near shore forecasts account for:

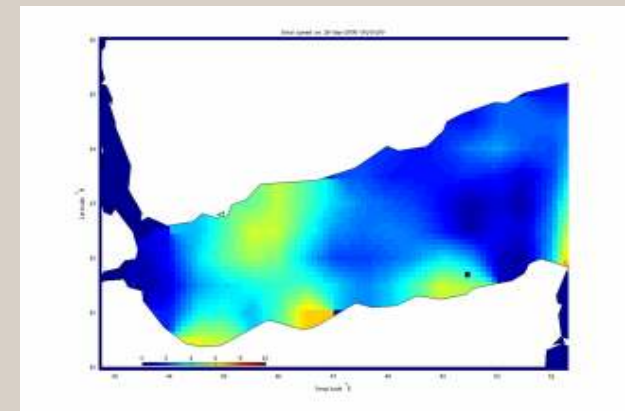
- Sheltering
- Bottom friction
- Refraction
- Shoaling
- Wave breaking

A near shore forecast is provided with either:

- An in house transformation model
- A regional SWAN model



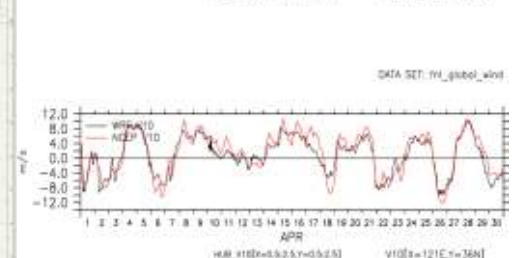
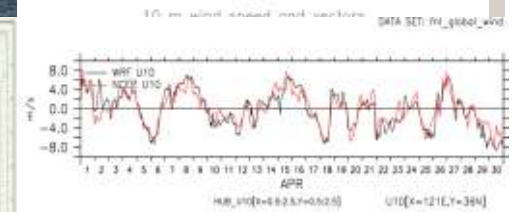
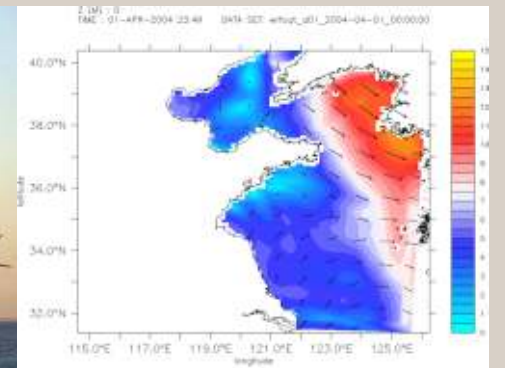
Hs and
wind
speed
Gulf of
Aden



High Resolution Atmospheric Modeling to support Wind Park developments

WRF hindcast data characteristics

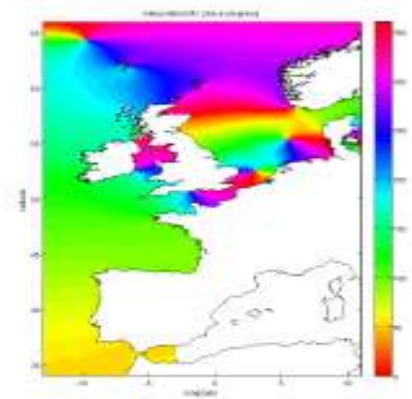
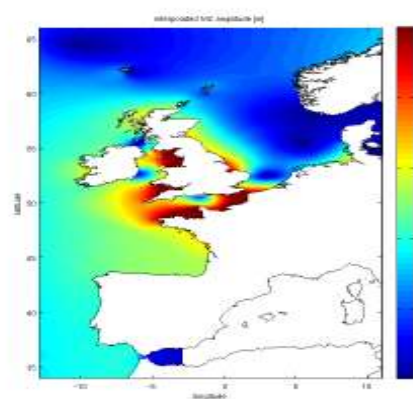
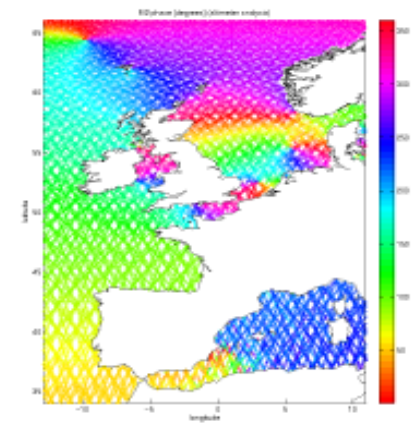
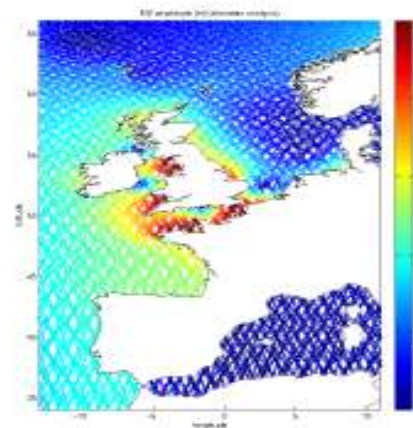
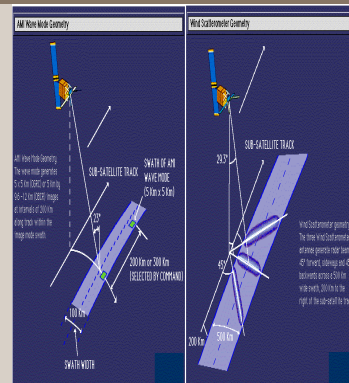
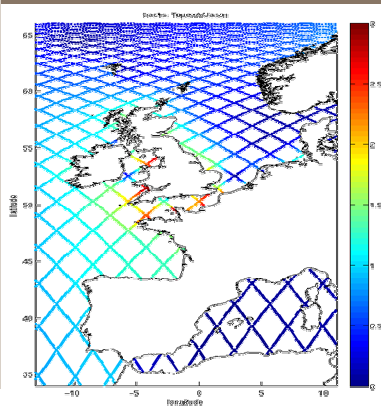
- Spatial resolution as fine as 1 km
- Fine resolutions achieved through nesting
- Data available up to a 10 minute time interval
- wind resource maps based on 20 years data
- Hindcast data up to 20 years, climate scenario's



Tidal Information Services

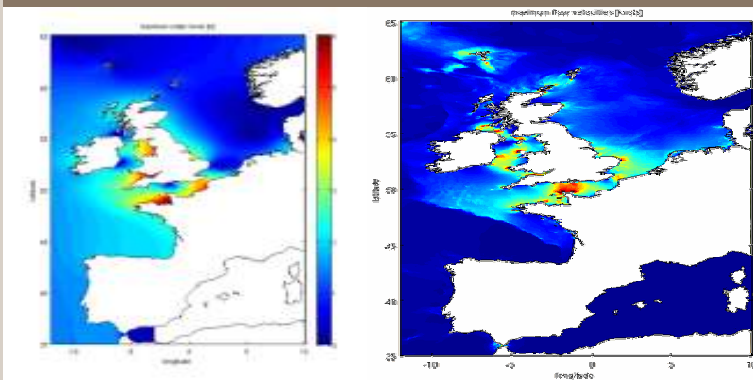
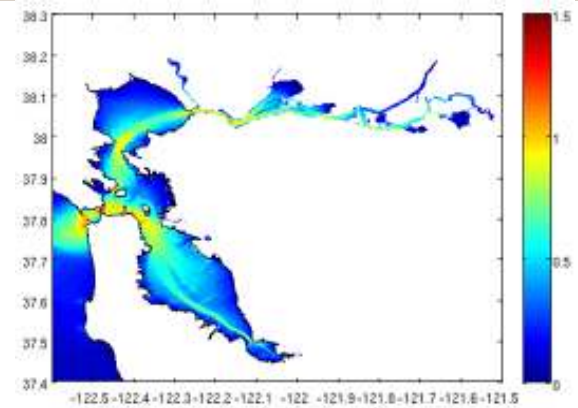
Characteristics:

- Based on integration of > 5000 tidal stations and over 20 years of satellite measurements
- Worldwide covering model (s)
- Information at resolutions of up to 1 minute as a standard product
- Finer resolutions on request



Tidal Information Services

- Services:
- Integrated on navigational systems
- Depth reduction of Surveys
- Support seismic surveys
-



Ice Information– Winter Conditions

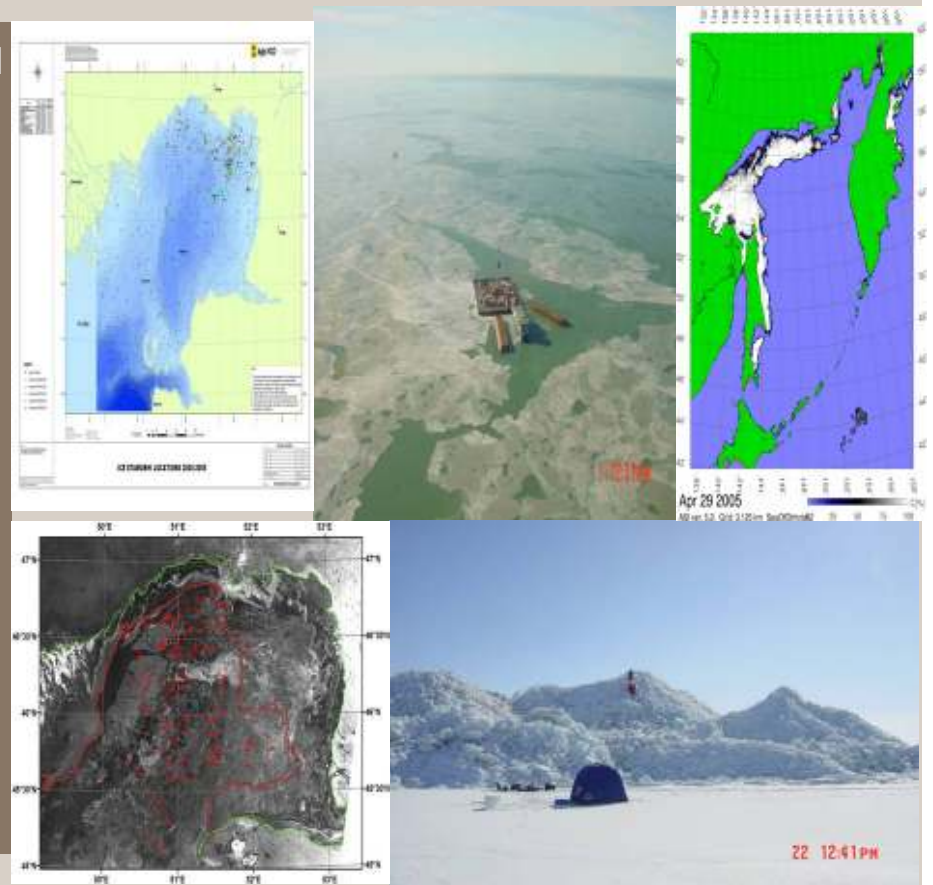
BMT responsible for all satellite data supply and Analysis in North Caspian

For AGIP KCO

Support:

Ice information to support

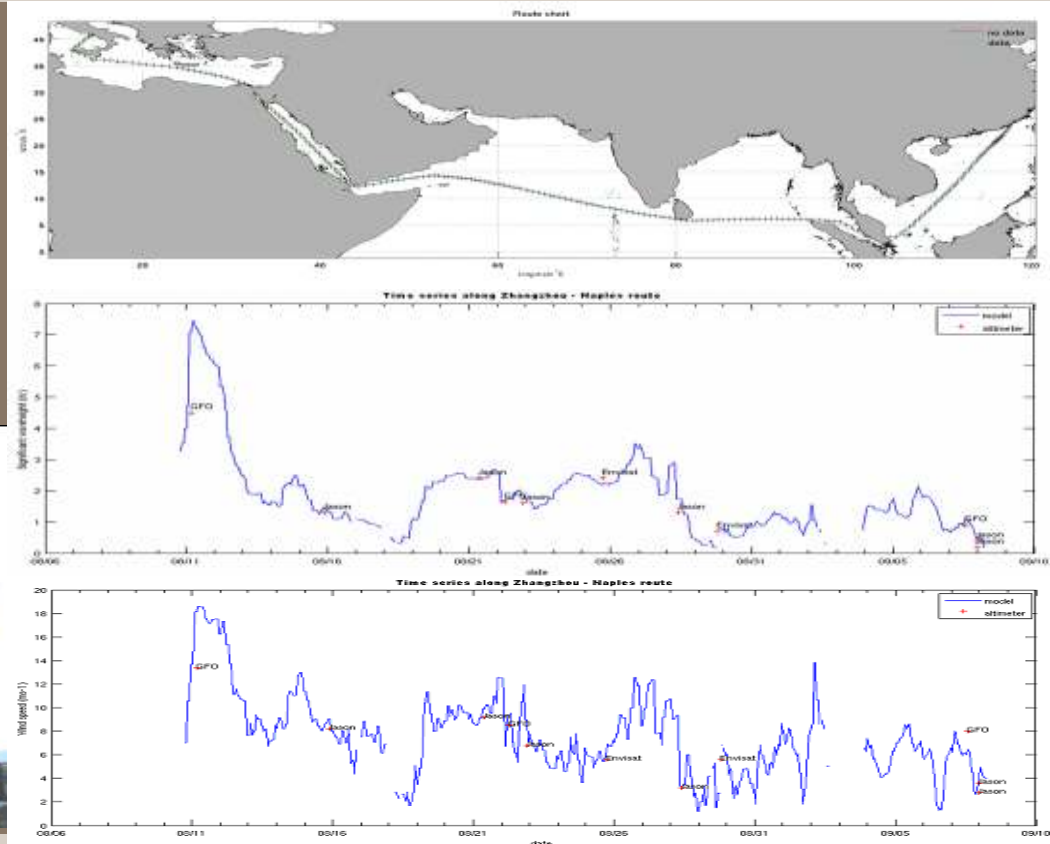
- Navigation
- Design



Forensic Analysis

During a transport from China to Italy there was damage to the cargo and vessel.

Model data & Satellite measurements along the route were for forensic analysis



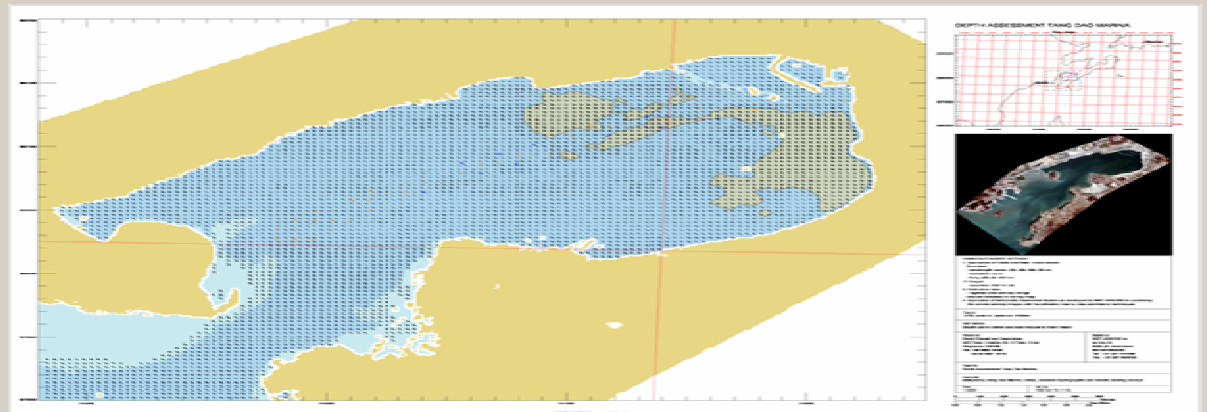
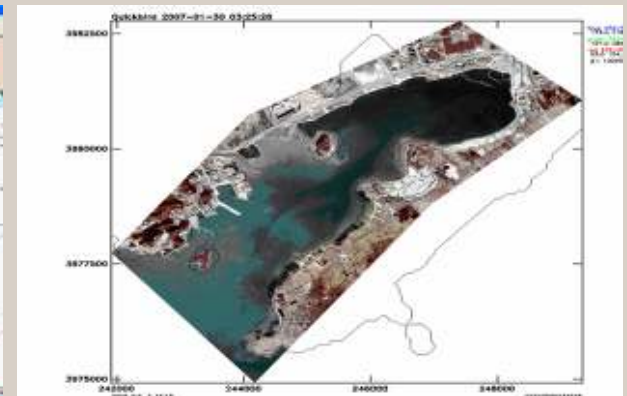
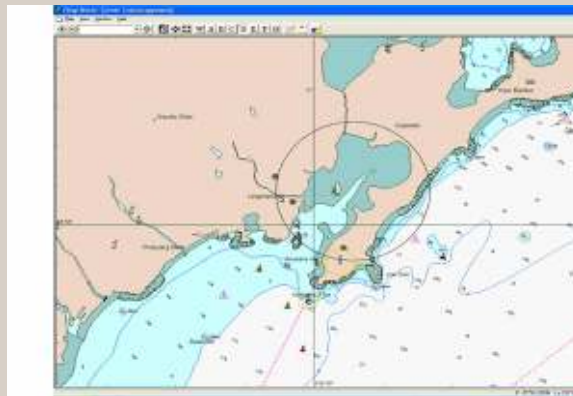
Shallow water Satellite based Bathymetry

Feasibility Study for Port Development

For project planning purposes there was an urgent requirement for bathymetry information in a port in China.

Using high resolution Quickbird imagery BMT provided a detailed bathymetry chart of the area of interest.

The chart was provided at a resolution of 20 by 20 meters



Conclusions

- Satellite data are nowadays (often integrated with models) an important source of data to support commercial applications in the maritime industry .
- Opportunities for using of Satellite data will increase due to globalization and lack of measurements in many parts of the world.
- Many applications are not yet developed and require intensive (long term) partnership and cooperation between industry and the research community.

Thank You

