



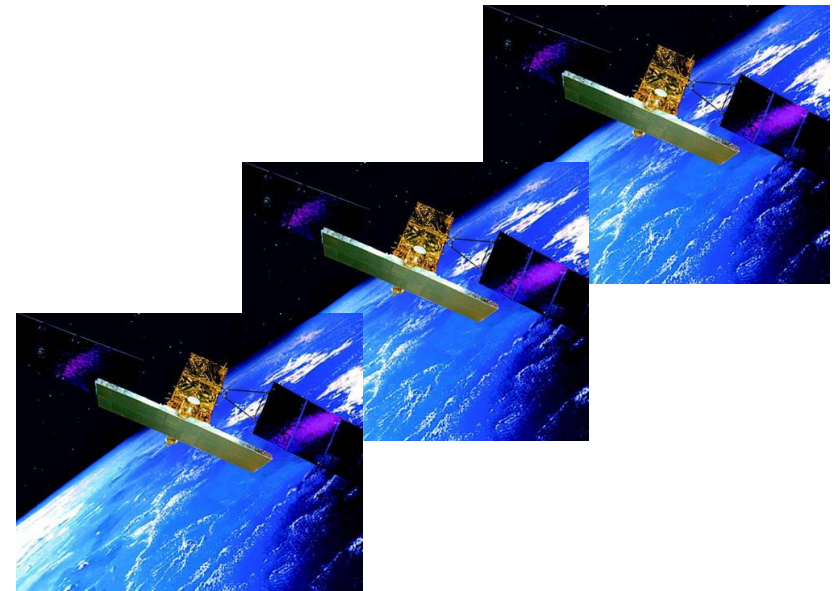
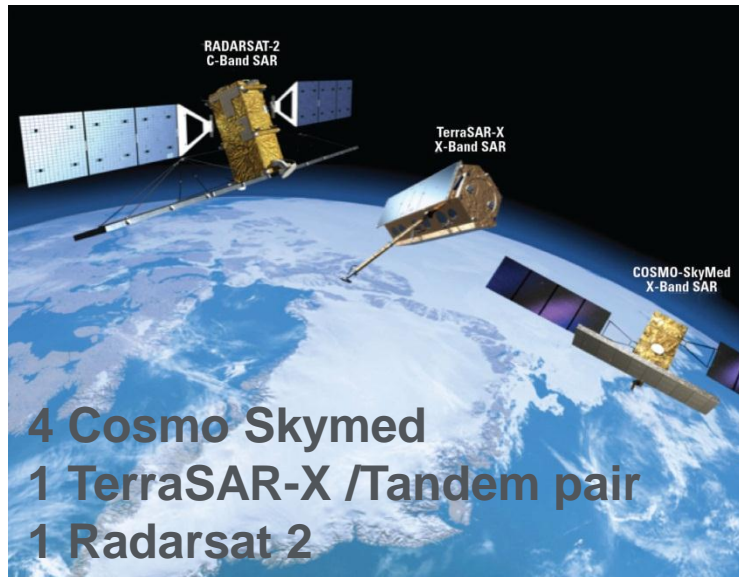
A New Space Applications Service Opportunity Integrated Situational Awareness Services

With
Telespazio VEGA UK

Ian Encke –
At the Imperial Space Lab Launch
1st July 2013

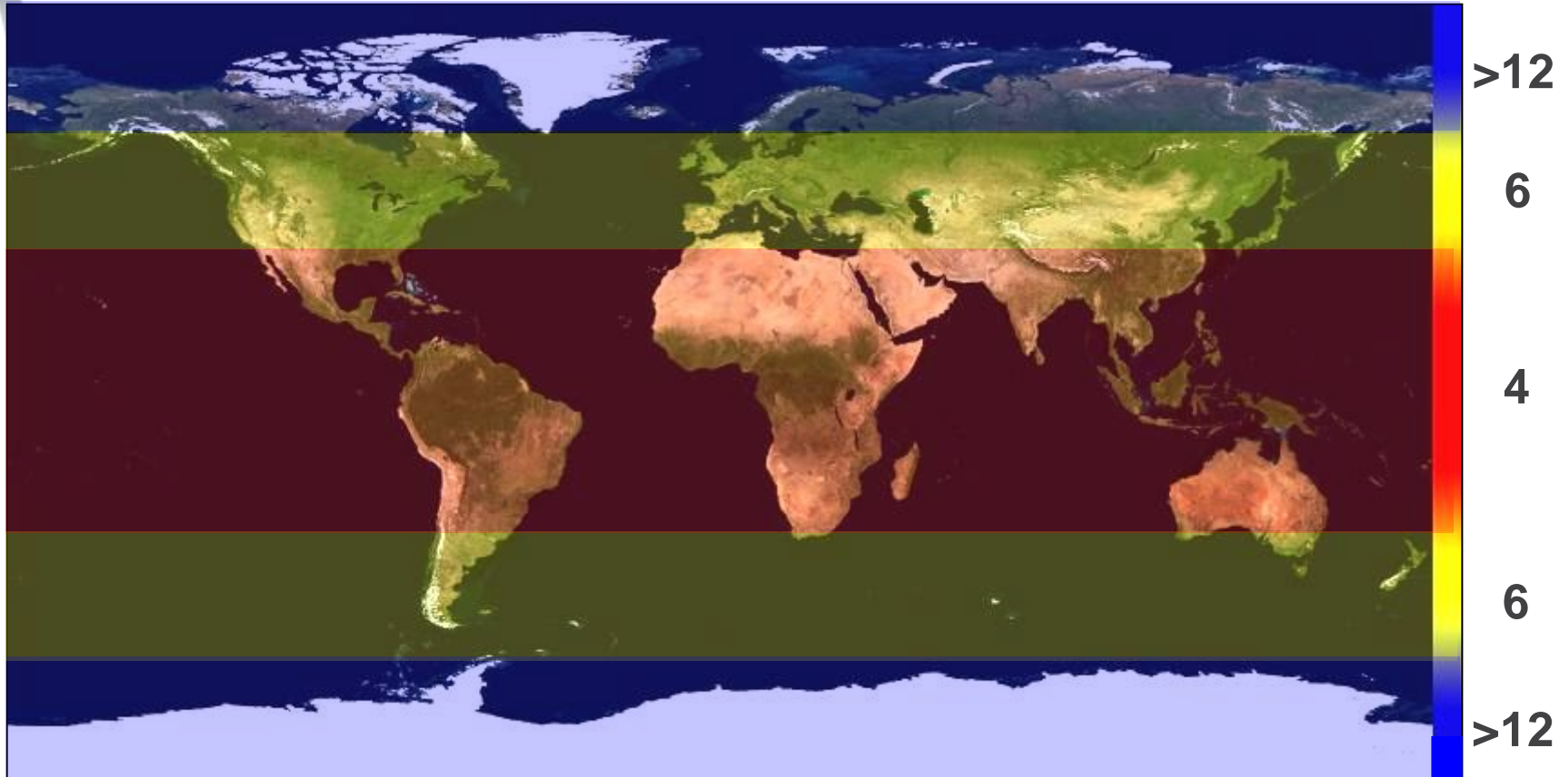
Why a NEW service opportunity?

- Today the space applications industry has an emerging capability to provide truly 24/7 surveillance services
- Why?



- For the first time we have access to enough timely, high resolution, all weather, night and day space imaging

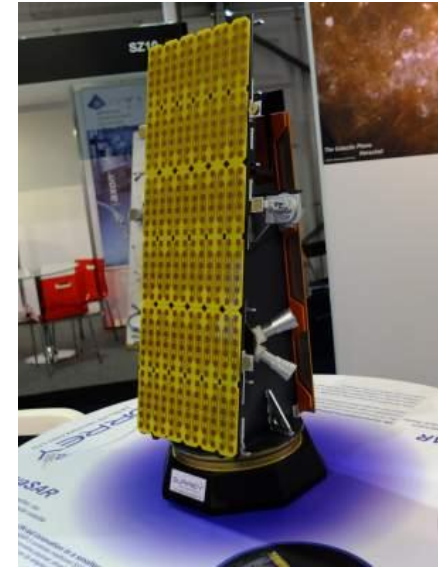
Cosmo Skymed alone revolutionises revisit capability



Acquisitions per day with the 4 satellites constellation
(the acquisitions are not spread uniformly throughout the day)

Opportunity for UK?

- Soon more Radar satellites will join the global constellation including, within a couple of years, our own UK Nova SAR
- Meanwhile, through Telespazio VEGA UK and Astrium UK we have preferential access to:
 - 4 Cosmo Skymed & 2 future Argentinian SAR sats
 - 1 TerraSAR / Tandem pair & 1 future Spanish TerraSAR variant
 - Through ESA we will have access to the future 2 Sentinel 1 satellites
- With the recent increased UK government investment in space, and the set up of UKSA and the Space Applications Catapult, UK is well placed to exploit this opportunity





Why Integrated Situational Awareness Services? It allows addition of UK innovation!

- High revisit radar is well suited to a range of situational awareness applications
 - Maritime and O&G
 - Security and Crisis Management
 - Agriculture and Forestry
- German and Italian companies have already cornered the market in 'first level' value add
- Telespazio VEGA UK believe the opportunity is to take those products further downstream through "integration" of UK innovations
- **We are looking for 'layer partners' partners to join our ISAS team to supply / develop innovative value add**

Who we are

- Telespazio VEGA UK (*VEGA Space Ltd rebranded in March 2012*)
 - Part of Telespazio (a Finmeccanica / Thales Company)
- UK SME made good! Small company ethos within a large company.
 - 1978 start up - 33 years' space domain knowledge
 - One of top 3 system consultancies supporting ESA and ranked first amongst top 4 selected by ESOC
 - Europe's leading data quality and spacecraft operations & simulations provider
 - Very strong reputation as a flexible and customer focused service provider
- Now also the Telespazio group supplier of Geo-Information services to
 - The UK and UK based international customers
 - The Netherlands and additional tbd markets

Finmeccanica's UK presence

**AnsaldoSTS**
Railway technologies
(London)

**TELESPAZIO VEGA**
UNITED KINGDOM
A Finmeccanica / Thales Company
Space and Satellite Solutions
140 employees (Luton)

**AgustaWestland**
A Finmeccanica Company
Helicopter development and production
3,500 employees
(Yeovil, Newquay, Farnborough)

**MBDA**
MISSILE SYSTEMS
Missile systems
3,000 employees
(Bristol, Stevenage, Lostock)
(25% owned JV)

**DRS**
TECHNOLOGIES
Defence electronics
50 employees
(Farnham, Long Bennington)

**FINMECCANICA**

UK HQ: Great George Street, London SW1
Total UK employees: 8,000+

**Selex ES**

4,600 employees

Sensor solutions
(Basildon, Edinburgh, Luton, Portsmouth, Southampton, Lincoln)

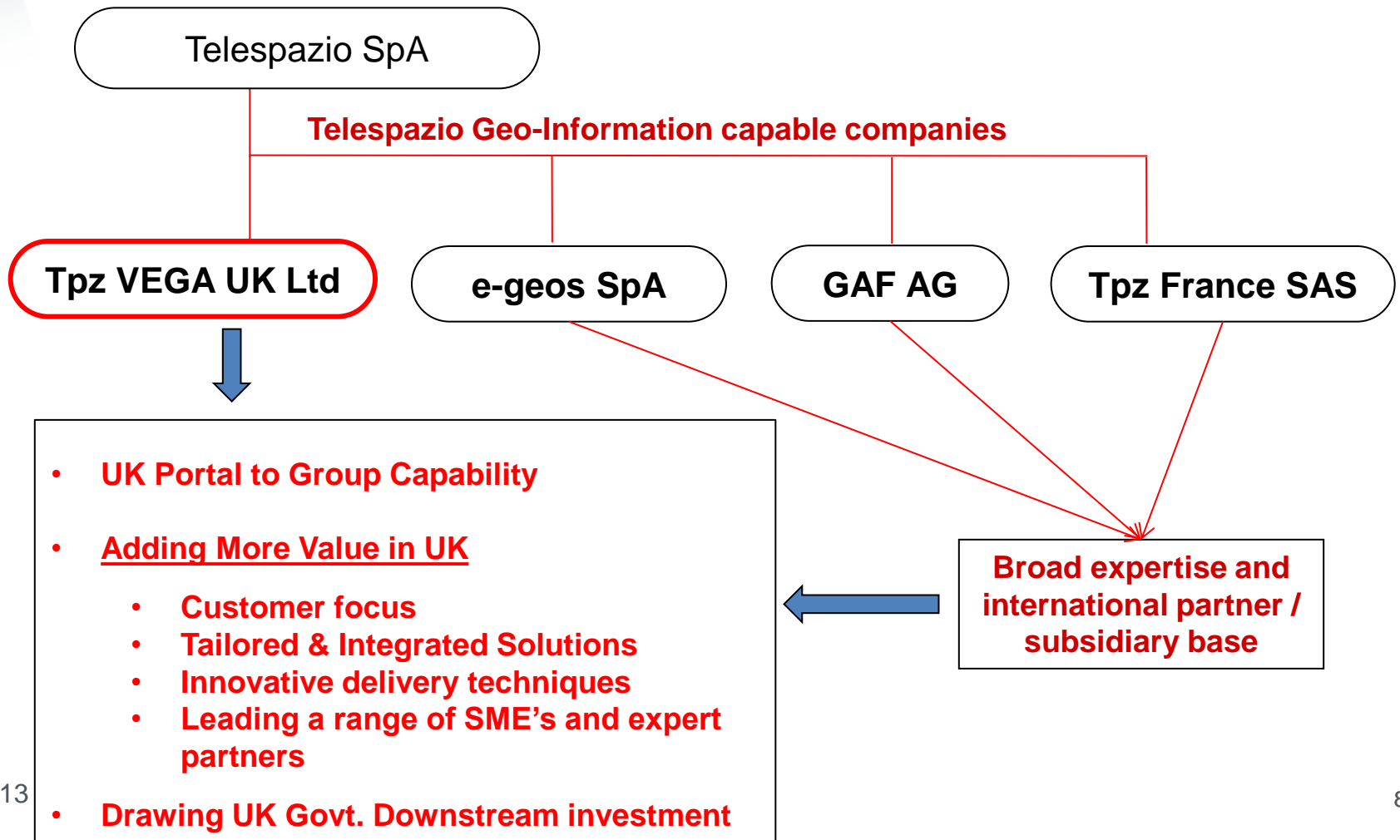
Secure networked solutions
(Basildon, Christchurch, Filton, Portsmouth, York, key UK ports)

Prime contracting and systems integration
(London, Southampton)

**Vega**

Consultancy
150 employees
(Bristol)

Group Geo-Information capability



Tpz VEGA Geo-Information Services:

A complete range - optical & radar, space & airborne

Defense & Security

- Multi-mission Satellite Data
- Border Control
- Rapid mapping
- Activities Monitoring



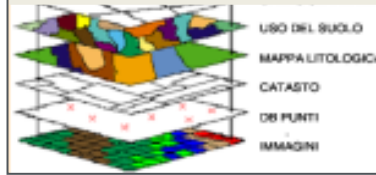
Maritime Surveillance

- Oil spills
- Ship detection
- Marine water quality
- Off-shore activities



Geo Info System

- Geographic Information Systems
- GIS Applications for territory and activity management



Integrated GIS

- On-line access
- Processing of geo-info products
- Web systems & Services



Agriculture

- IACS-GIS Solutions
- Parcel Reference Systems
- Subsidy Controls
- Assistance to Administrators and Farms
- Agro-Risk Management



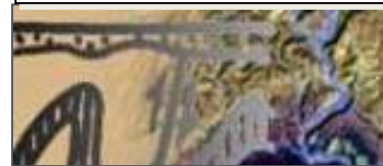
Forestry

- Forest Mapping
- Forest Inventories
- Biomass and Carbon Stocks
- Biodiversity Inventories
- Forest Management Systems



Geology

- Geological Mapping
- Mining Management
- Hydrocarbon Exploration
- Groundwater Exploration
- Administration Support



Cadastre / Land Mgt

- Land Administration
- Cadastres
- Water Management
- Land Information Systems
- Institutional Land Management



Orthom & Cartography

- Satellite data
- Aerial/satellite orthoimages
- Technical Cartography
- Digital Terrain Models
- Land Use and Land Cover
- 3D models and visualization



Infrastructure

- Transportation Systems
- Utility Management
- Facility Management
- Communication Solutions
- Location Based Services



Risk Mgmt, Civil Protection

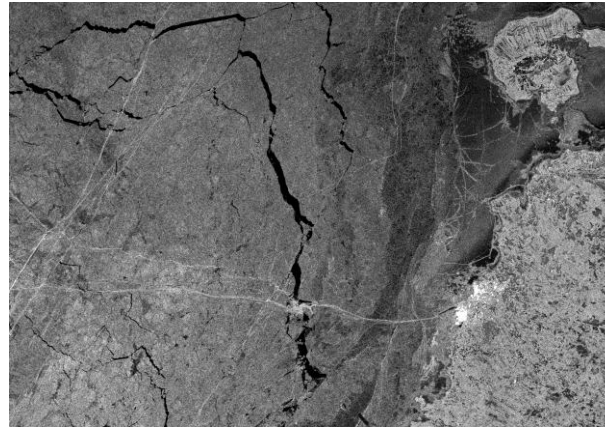
- Landslide;
- Forest fires;
- Floods;
- Geohazard;



Environment

- Environmental quality analysis
- Subsidence;
- Coastal zone management
- Land Use Planning
- Watershed Management
- Disaster Management
- Environ. Capacity Building



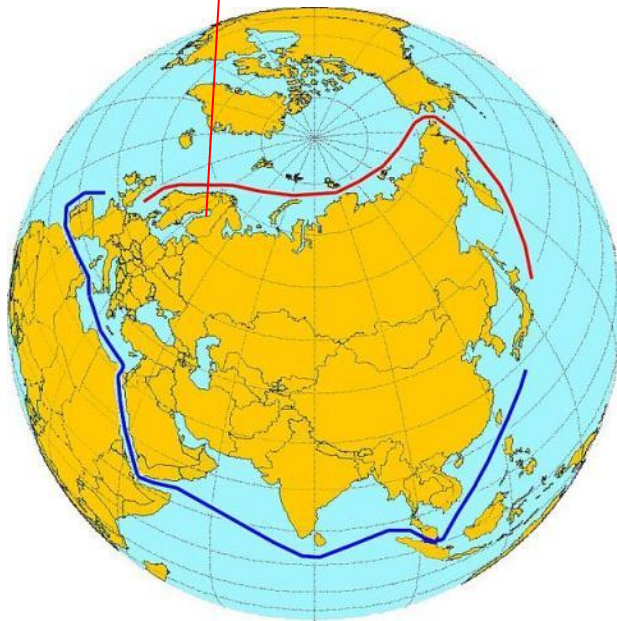
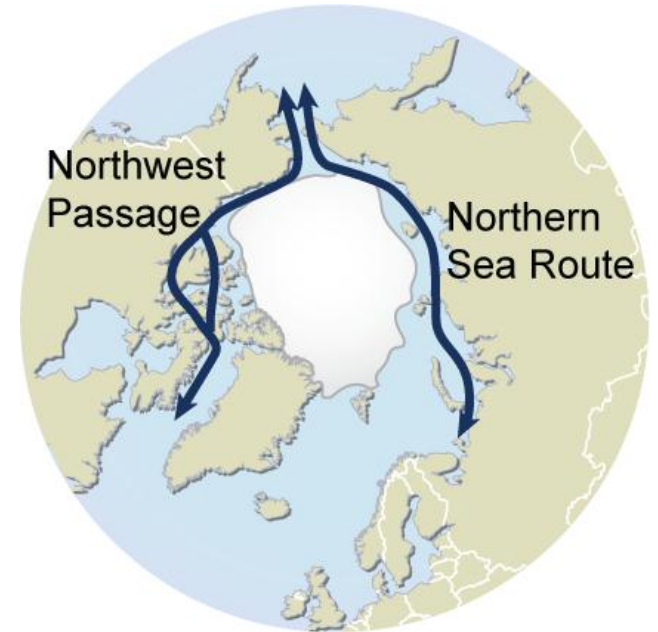
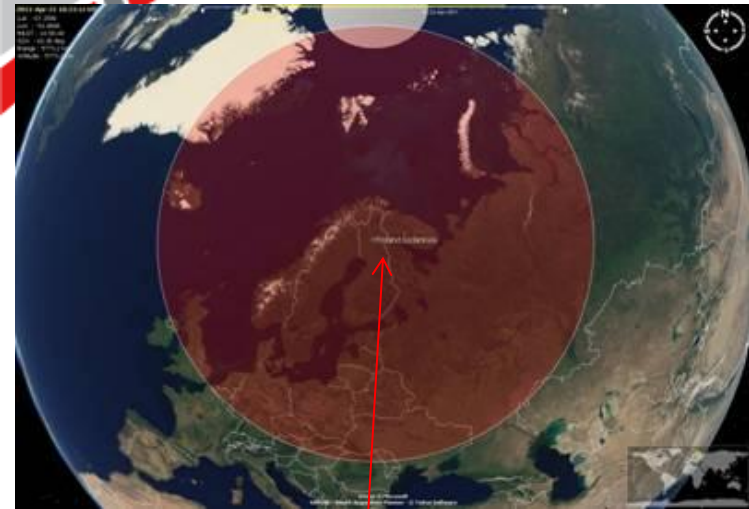


An Integrated Situational Awareness Service Example
Exploiting Ice Monitoring & Maritime Services



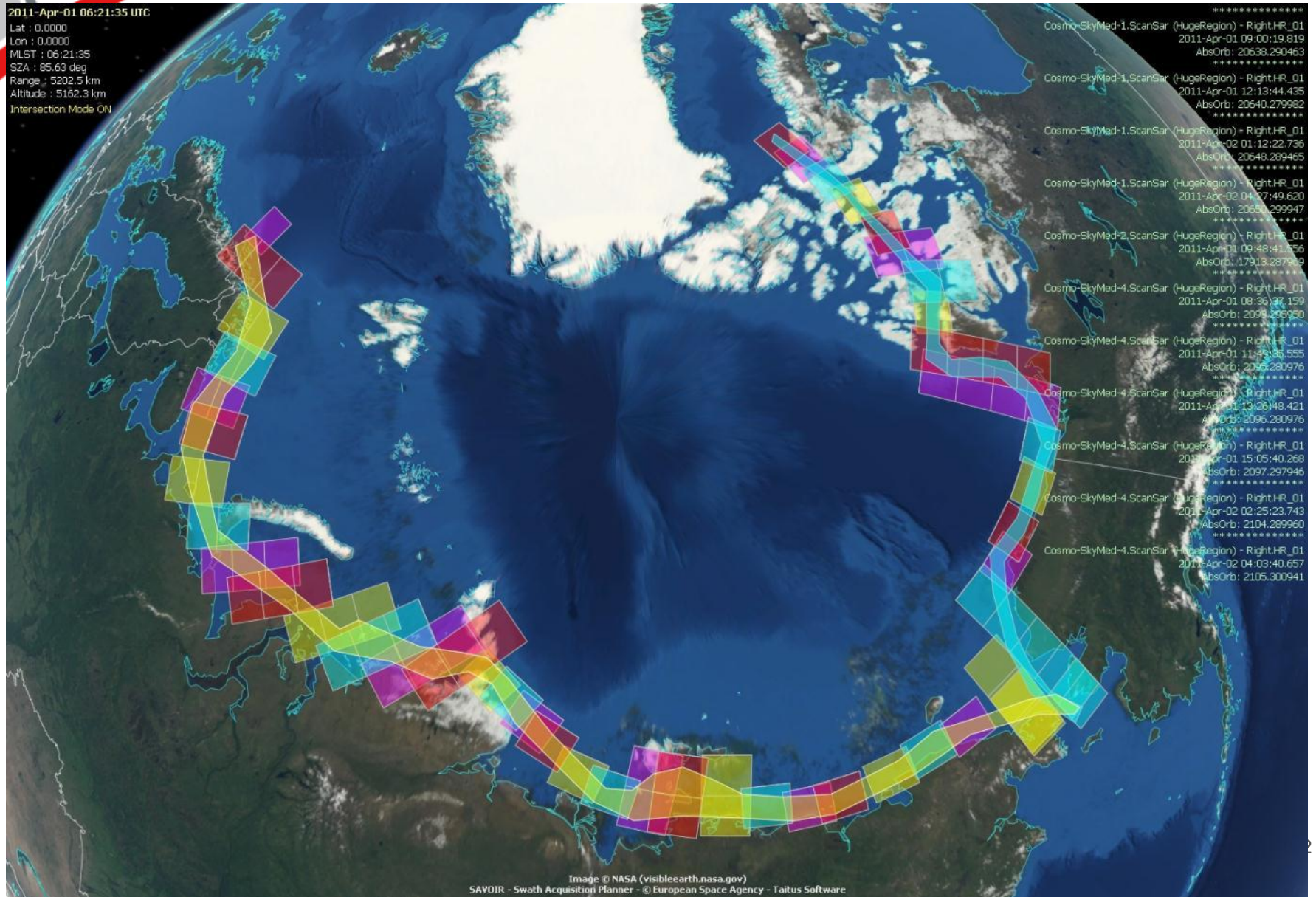
Ice Mapping & Monitoring

- The Polar Sea Routes



Cosmo constellation allows daily monitoring

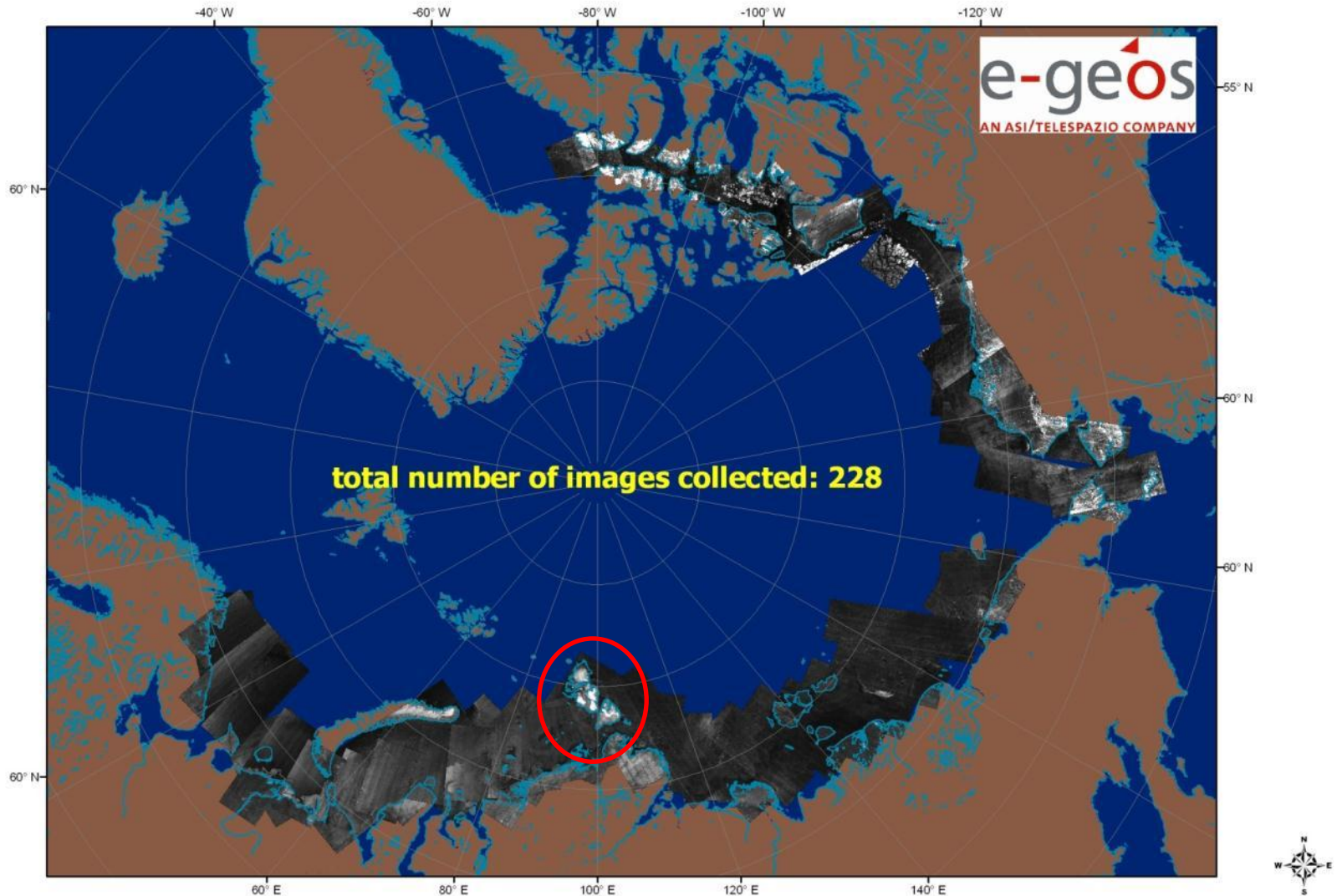
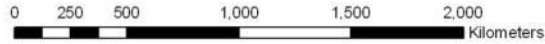
- Scenario shows 24 hr descending cover



Demonstration:

– 228 images in 24 hours

**COSMO-SkyMed northern routes test collection
(dedicated to John Franklin and Michail Vasil'evič Lomonosov)**



New Tpz VEGA-UK Services

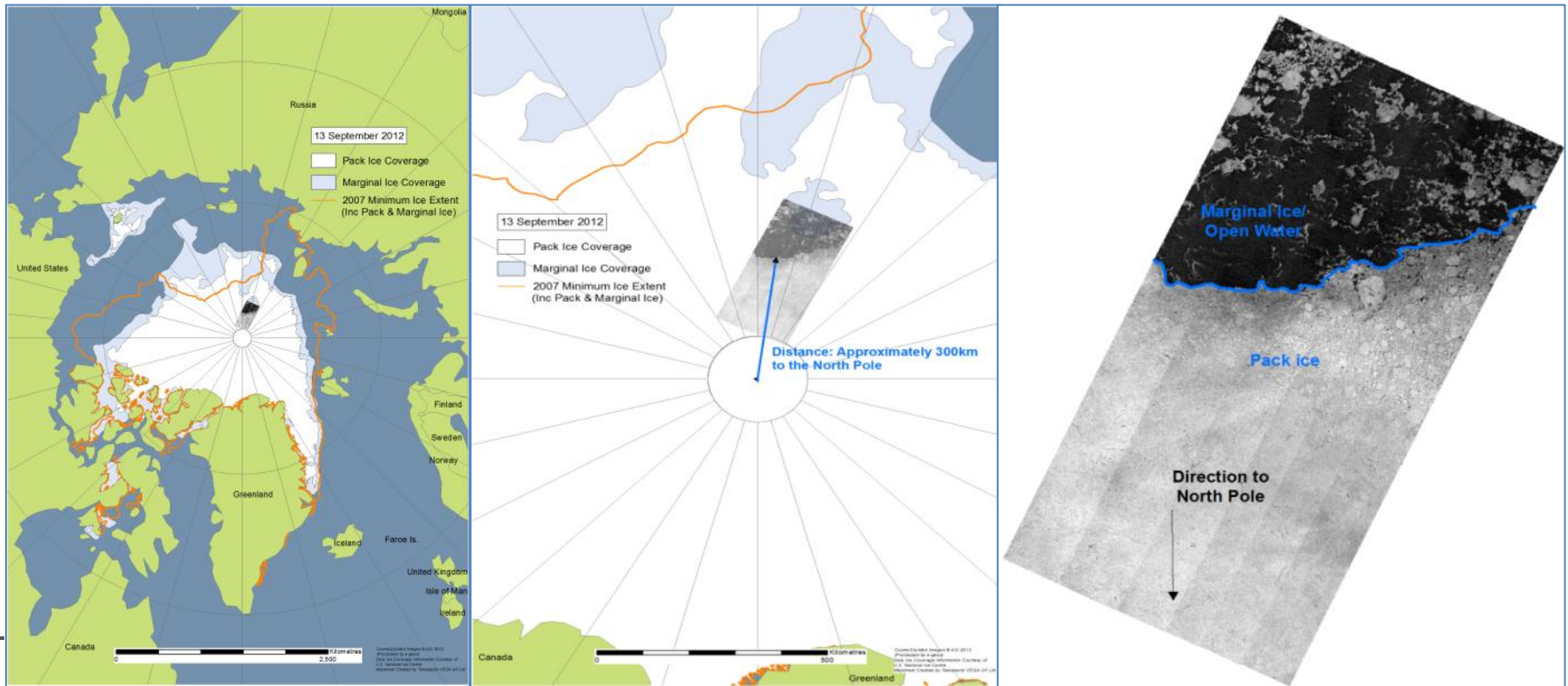
2012 - we partnered with BAS and PMOC Cryosat team to develop:

- New ice related products (SME partner)
- Delivery to high latitudes through low B/W links (SME partner)
- Tablet & Mobile platform product delivery

2013 - we expanded partner base to develop an

Integrated Situational Awareness Service (ISAS) for the Arctic

- **We would welcome additional partners for both maritime & land ISAS applications**



Integrated Situational Awareness Services

ISAS – Maritime

(Includes Arctic)

- **Scope & Background (1)**

- **Provide, via tailored innovative & user friendly interfaces, a situational awareness service supporting the maritime environment**
- **Integrating:**
 - Near Real Time (NRT) Geo-I imaging (space & air) and analysis
 - Weather data and modelling
 - Situational modelling
 - e.g. inshore and deep water oil drift analysis, forward & back tracking, co-operative and non cooperative target identification, ice movement and thickness, crowd sourced wave height and bathymetry, etc.
 - Geo-location (AIS, VMS, etc)
 - Narrow Bandwidth Satellite Communications
 - Real Time in situ Verification data
 - Volunteered and solicited crowd and other sourced verification data (video, photos, human intelligence, ships instruments, buoys, etc.)
 - Total maritime picture

ISAS – Maritime

- **Scope & Background (2)**

- **Application Primarily maritime / littoral but also lakes & rivers**

Maritime Application Fields:

- Crisis Response (Environmental or Security)
- Maritime Traffic Management & Monitoring
- Environmental & Pollution Control and Policing
- Off shore Oil & Gas, Mining and Energy Operations
- Border Control
- Port security and environmental monitoring
- Search & Rescue
- Piracy Prevention / Response
- Fisheries Protection
- Anti Trafficking
- Minimum Emissions Routing
- Maritime Tourism
- Maritime Leisure Market
- **Operations in Ice and in Ice-burg waters**
(Niche Market within Maritime ISAS)

Situational Awareness in remote locations – In Situ Images & Video

- Increasing Arctic activity means increased risks



- More need for detailed (high bandwidth) 2 way data exchange
- At high latitudes communications band width is limited so utility of ice charting and emergency services is limited
- Vega and partners aim to solve this problem

Situational Awareness in remote locations – In Situ Images & Video

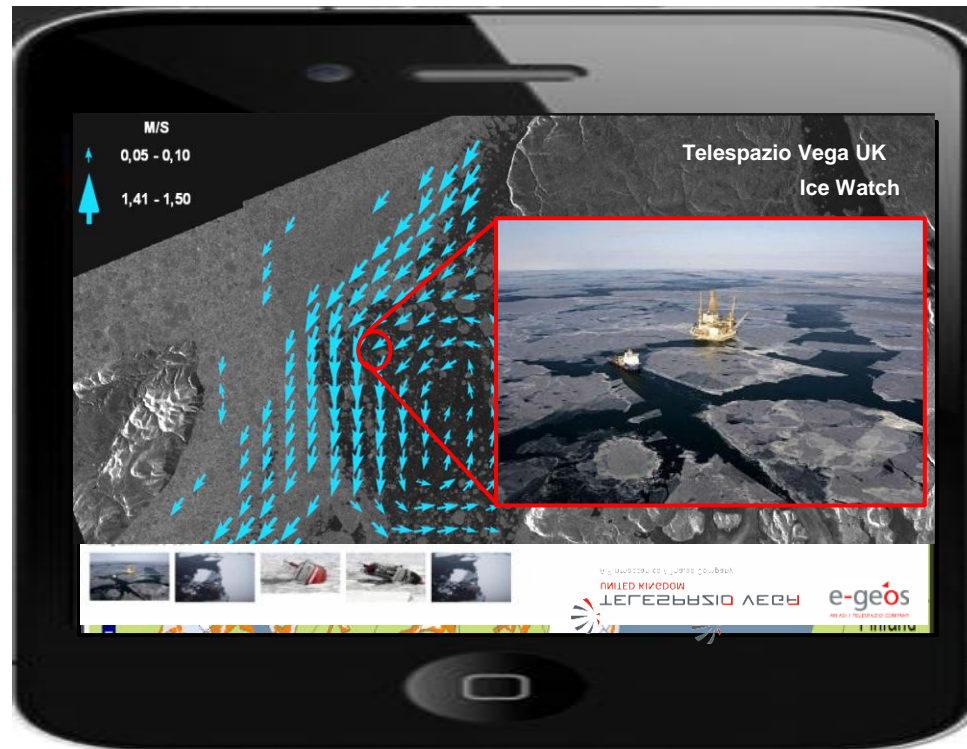
The image displays a screenshot of the ASIGN Web interface, which is a web-based mapping and observation tool. The interface is divided into several sections:

- Top Navigation:** Includes a menu with 'MAIN', 'HELP', 'STATUS', and 'ADMIN'. The current user is identified as 'vegaspacadmin'.
- Map Area:** Shows a map with various colored overlays (green, blue, orange) and a grid. A small in-situ image is overlaid on the map, with a caption box that reads: 'Caption: Uploaded on 2012-11-30 Username: vegaspacpc Captured: 2012-11-30 16:22:06LT'.
- Right Panel:** A large, detailed view of the in-situ image, showing a boat in a body of water surrounded by ice.
- Bottom Panel:** A list of observations, with the first one selected. The caption for this observation is: 'Caption: Uploaded on 2012-11-30 Username: vegaspacpc Captured: 2012-11-30 16:22:06LT'. Below the list are several small thumbnail images.

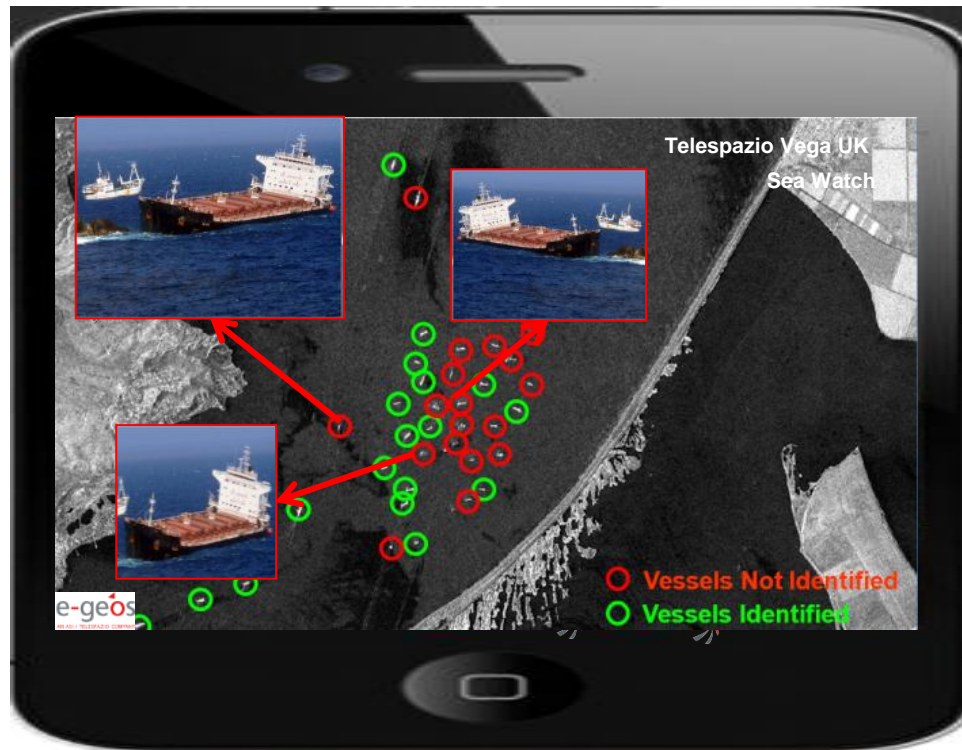
The interface also includes standard web browser controls and map navigation tools like a zoom slider and a compass.

Integrated Situational Awareness Services (ISAS) – The Vision

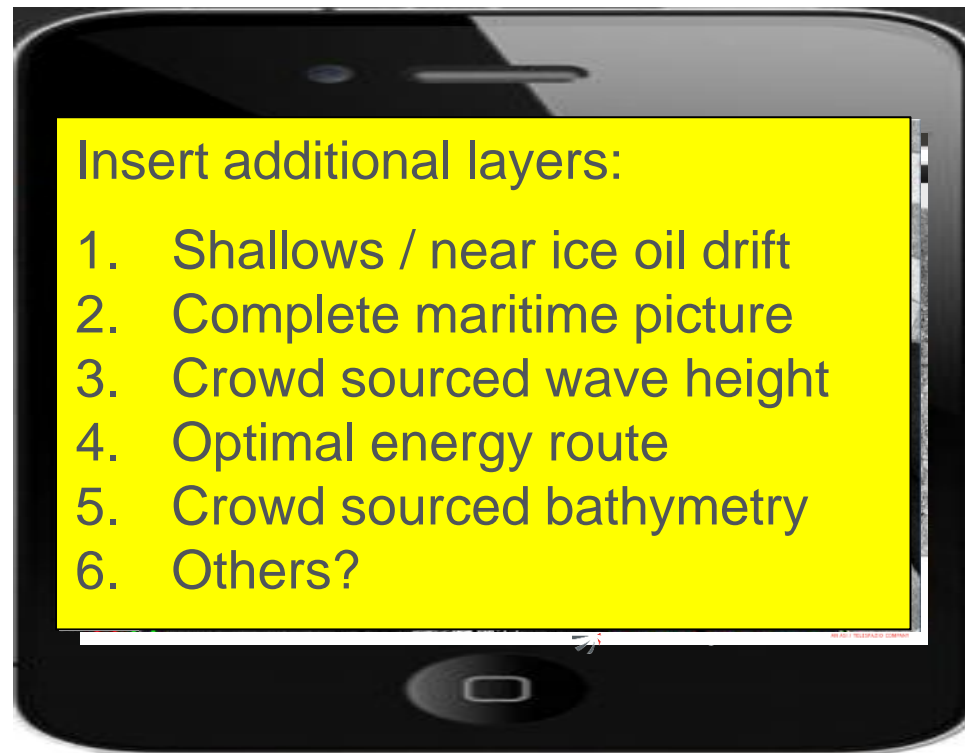
Arctic Services – ‘Ice Watch’ Preview:



Maritime Services – ‘Sea Watch’ Preview:



Maritime Services – ‘Sea Watch’ Preview:



Integrated Situational Awareness Services

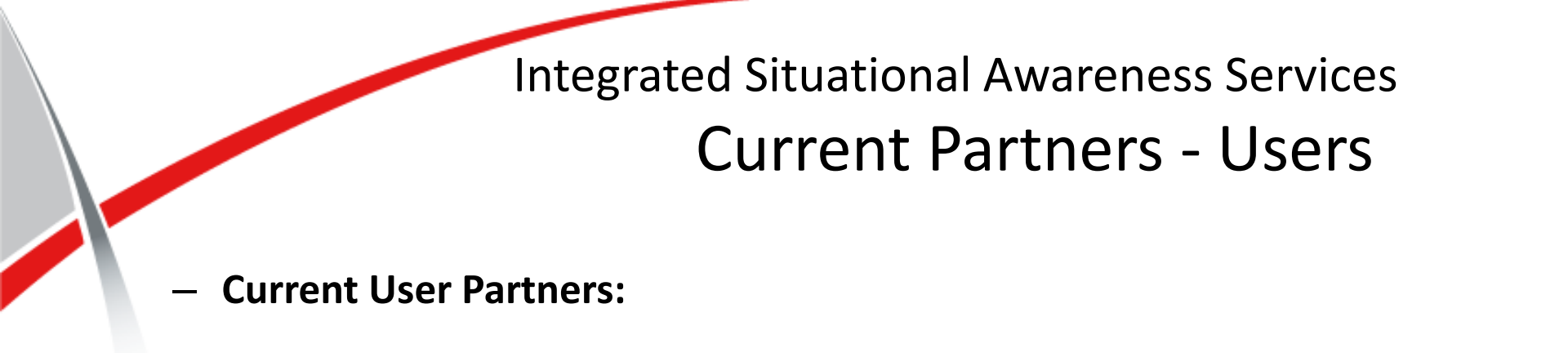
Current Partners – Service Development

– Current Service Development Partners:

- **Telespazio Vega UK** - ISAS integrator and supplier
- **E-geos** – Existing O&G / Maritime & Ice Products and Services
- **GAF** – Consultancy services

- **HR Wallingford / Sea Zone** - Maritime research centre, Web delivered services - weather, winds, currents, etc. fo
- **FedNav** – Ice breaker fleet and in house operational Ice Service provider
- **AnsuR** – Low Bandwidth delivery of integrated of high resolution situational awareness imagery and data
- **AstroSat** – In shore, in port and near ice oil drift modelling
- **Smart Com** – crowd sourced bathymetry
- **Critical Software** – operational Search & Rescue total maritime picture integrator

- **Marine South East** – maritime cluster – consultants on maritime user requirements
- **Exact Earth** – Satellite AIS supplier
- **Iridium** – High Latitude Bandwidth supplier
- **Inmarsat** – Bandwidth supplier



Integrated Situational Awareness Services

Current Partners - Users

– Current User Partners:

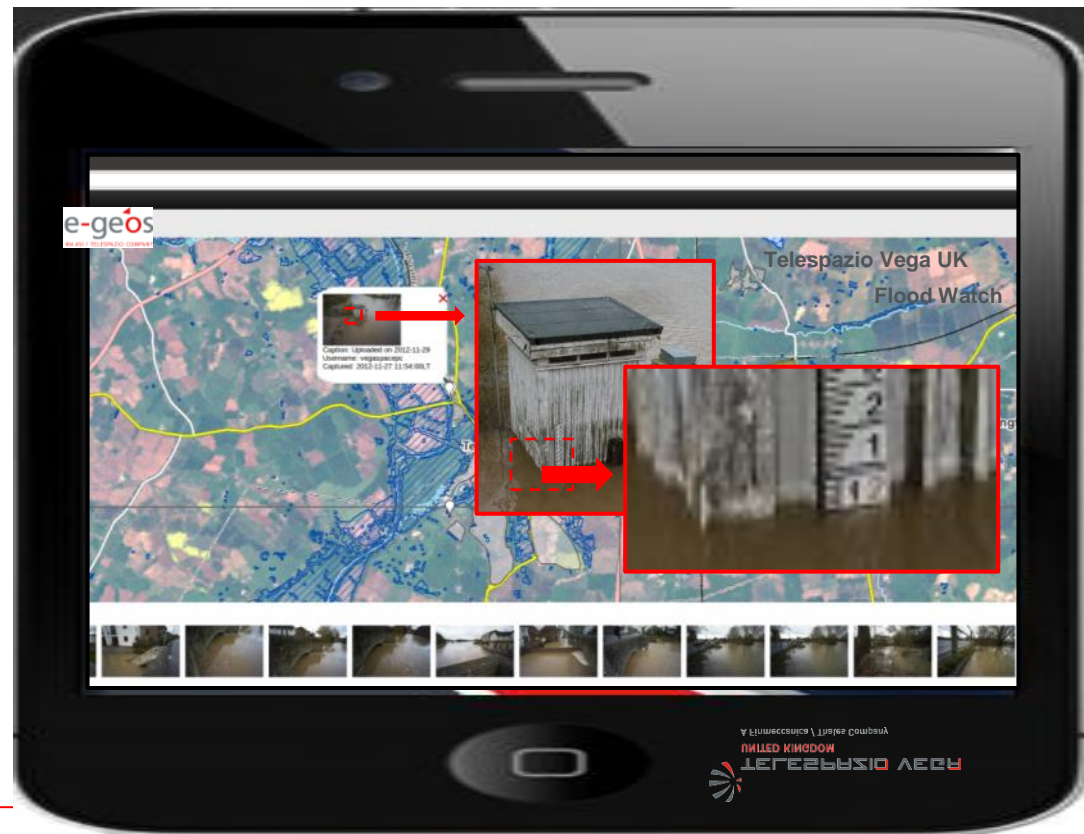
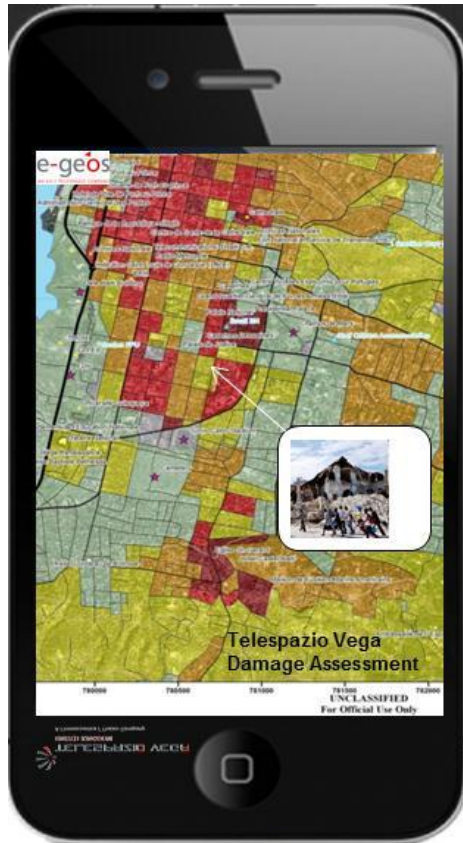
- **All domains below plus Fishing & on Shore Mineral Extraction**
 - Government of Greenland
- **Shipping**
 - JSC Murmansk Shipping Company,
 - FedNav
- **Tourism**
 - Association of Arctic Expedition Cruise Operators (AECO),
 - Lindblad Expeditions,
- **Oil & Gas**
 - ENI
 - Conoco Philips
 - Spatial Energy
 - One other major oil company support letter in approval loop at time of bid
 - One other major oil company requested involvement post bid

Integrated Situational Awareness Services

ISAS – **Crisis Management** (Primarily Land)

- **Scope & Background**
 - **Provide, via tailored innovative user friendly interfaces, a dual use commercial SA service supporting Crisis management**
 - **Integrating:**
 - Near Real Time (NRT) Geo-I imaging (space & air) and analysis
 - Pre/During/Post event situational modelling
 - (e.g. Nuclear crisis management tools, fire detection modelling, flood management tools, traffic management tools, damage assessment modelling, etc.)
 - Narrow Bandwidth Satellite Communications,
 - Real Time volunteered and solicited in situ crowd and other sourced verification data (geo-located video, photos, human intelligence)
 - **Application Fields (Primarily Land)**
 - **Disaster**
 - (e.g. Flood, Earthquake, Severe Weather, Fire, Nuclear, Post and pre event insurance)
 - **Security**
 - (e.g. Terrorism, Border Control, **Critical Infrastructure Monitoring (commercial or otherwise)**, Trafficking, Population Displacement, Policing (Major Events / Civil Unrest), Military Conflict)

ISAS – Crisis Management Solution – The Vision



Improved remote situational awareness for NRT land emergency services



Thank you for listening!

Happy to answer any questions now and later.

If you would like to join the team or have an ISAS delivery tailored to your or your customers needs please get in touch!



Telespazio VEGA UK

Ian Encke

Head of Geo Information Business Development

+44 782 353 6902

ian.encke@vegaspaces.com

www.telespazio-vega.com