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Polar Thematic Exploitation Platform

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Polar regions play an important role in regulating and driving the global climate & are experiencing significant change.

There is growing global interest, both political and economic.

New opportunities are driving increased activity.

There is widespread concern about the potential impact on a delicate and pristine environment.

New tools to model, understand and monitor these changes are vitally important to better predict and mitigate the resulting global economic and environmental consequences.
• Access for authorized users using ESA EO-SSO
• Access all services and processors through a web portal
• A platform catalogue providing details of accessible data and generated products
• Virtual development environment providing user VMs
• Execution environment
• Interfaces based on open standards
• Iceberg detection
• Iceberg areal density
• Iceberg risk
• Iceberg trajectory
• Trajectory animation
• Iceberg association
• Iceberg calving volume
• 2d map of predefined regions
• Time series of NETCDF files
Polar TEP Process Chains

- Sentinel 1 Image
- Iceberg Detection
- Iceberg Trajectory
- Go/No-Go Zones
- Iceberg Density
- Iceberg Trajectory Animation
• Access for authorized users using ESA EO-SSO
• Access all services and processors through a web portal
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Pre-Operations Activities

• Pilot project: describe the fate of icebergs from source to deterioration
• Integration of operational processing chains: Polar View, Antarctic vegetation, snow monitoring
• Arctic research data infrastructure
• Sentinel-2 albedo over Greenland
• Sea ice concentration and sea ice motion
• Oil spill detection
Northwest Passage Tactical Support

• International Ice Patrol (IIP) provided tactical support for USCG Cutter Maple (August 2017)

• New geographic area, new information product

• Evaluation of Polar TEP: iceberg detection, aerial density, trajectories

• Comparison with current operational processes
Northwest Passage Tactical Support – Iceberg Detection
Northwest Passage Tactical Support – Iceberg Areal Density
Northwest Passage Tactical Support – Iceberg Density Categories

<table>
<thead>
<tr>
<th>Isolated</th>
<th>Few</th>
<th>Many</th>
</tr>
</thead>
<tbody>
<tr>
<td>● 0-1 icebergs per 1° by 1° grid cell; or more than 45 NM between icebergs</td>
<td>● 2-6 icebergs per 1° by 1° grid cell; or 10-44 NM between icebergs</td>
<td>● 7 or more icebergs per 1° by 1° grid cell; or less than NM between icebergs</td>
</tr>
<tr>
<td>● Little maneuvering with steady course and speed.</td>
<td>● Some maneuvering and reduced speed.</td>
<td>● Frequent maneuvering and low speed.</td>
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Northwest Passage Tactical Support – Final Information Product

Legend:
- Sentinel 1a,b Coverage - 14 Aug
- Approximate Sea Ice - 15 Aug

NOTE: Icebergs may be present inside sea ice. Refer to USNHC and CIS charts for detailed sea-ice analysis inside of ice edge.
Northwest Passage Tactical Support – Iceberg Trajectories
Path Forward

- Current situation – functioning platform, engineering requirements met, limited set of capabilities in place focused on a pilot project
- Additional data added to catalogue
- New processors developed and integrated
- Additional users
- New capabilities, such as routine and batch processing capabilities,
- Increase available computing resources,
- Integration with other relevant developments (e.g. DIAS)