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- 1 TurbineHub
- 2 L3 Harris Geospatial
- 3 Planet Labs

BACKGROUND

- The European Earth Observation Programme "Copernicus", states Synthetic Aperture Radar (SAR) has the advantage of operating at wavelengths not impeded by cloud cover or a lack of illumination and can acquire data over a site during day or night time under all weather conditions. Sentinel-1, with its C-SAR instrument, can offer reliable, repeated wide area monitoring.
- Global daily imagery analysis is an invaluable method for asset monitoring and intelligence that has only existed in its current form for less than a decade.
- This poster presents the tracking methodology created by TurbineHub, L3 Harris Geospatial, and Planet Labs that enables a near real-time monitoring of offshore asset development.

OBJECTIVE

- Use Block Island as an example to show the development of an offshore wind farm from permit through COD.
- Investigate the use of Sentinel One SAR data and daily satellite imagery to track the development of Block Island Offshore Wind. From maritime activity to construction phases.
- Build upon existing software programs to track the various stages of Block Island Wind's project construction. Develop imagery and SAR analysis that matches development timeline milestones.
- Leverage SAR and AIS data to better track maritime activity around the project site and surrounding ports.
- The methodology is implemented in an in-house tool developed in Esri ArcGIS capable of interacting with Planet Labs PlanetScope, SkySat, and Sentinel 1 data prepared and analyzed by L3 Harris Geospatial ENVI SARscape, enabling imagery downloads for any project site located offshore US.

Method

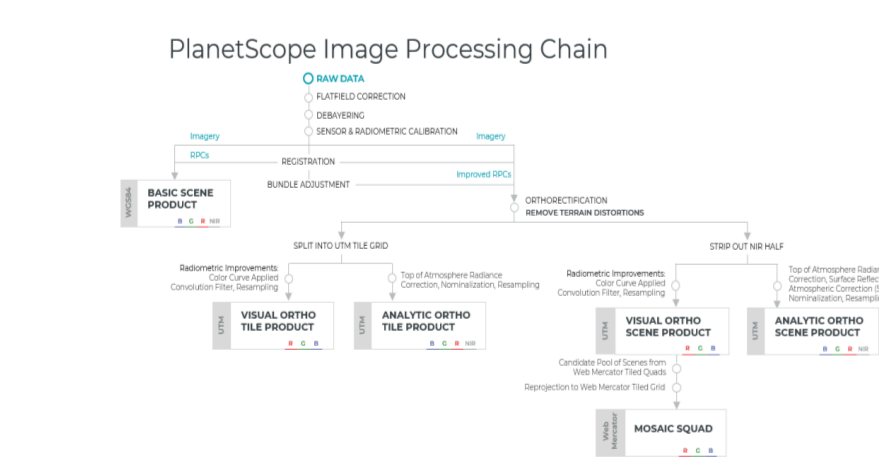
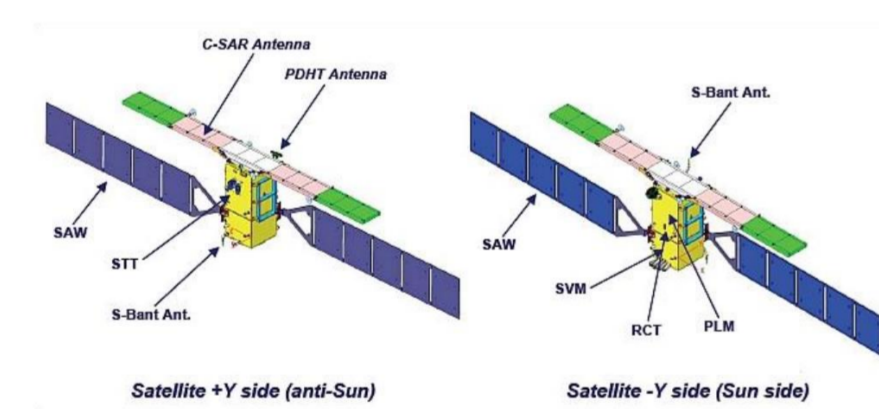
SAR data from Sentinel 1 satellite constellation. Data refined and processed by L3 Harris ENVI SARscape. Image depicting Sentinel 1 satellite design.

Developed time specific Imagery using Planet Labs RapidEye and PlanetScope satellite constellations.

Planet Lab's RapidEye constellation included 5 satellites that operated daily from 2009 to 2020. Great for historical tracking.

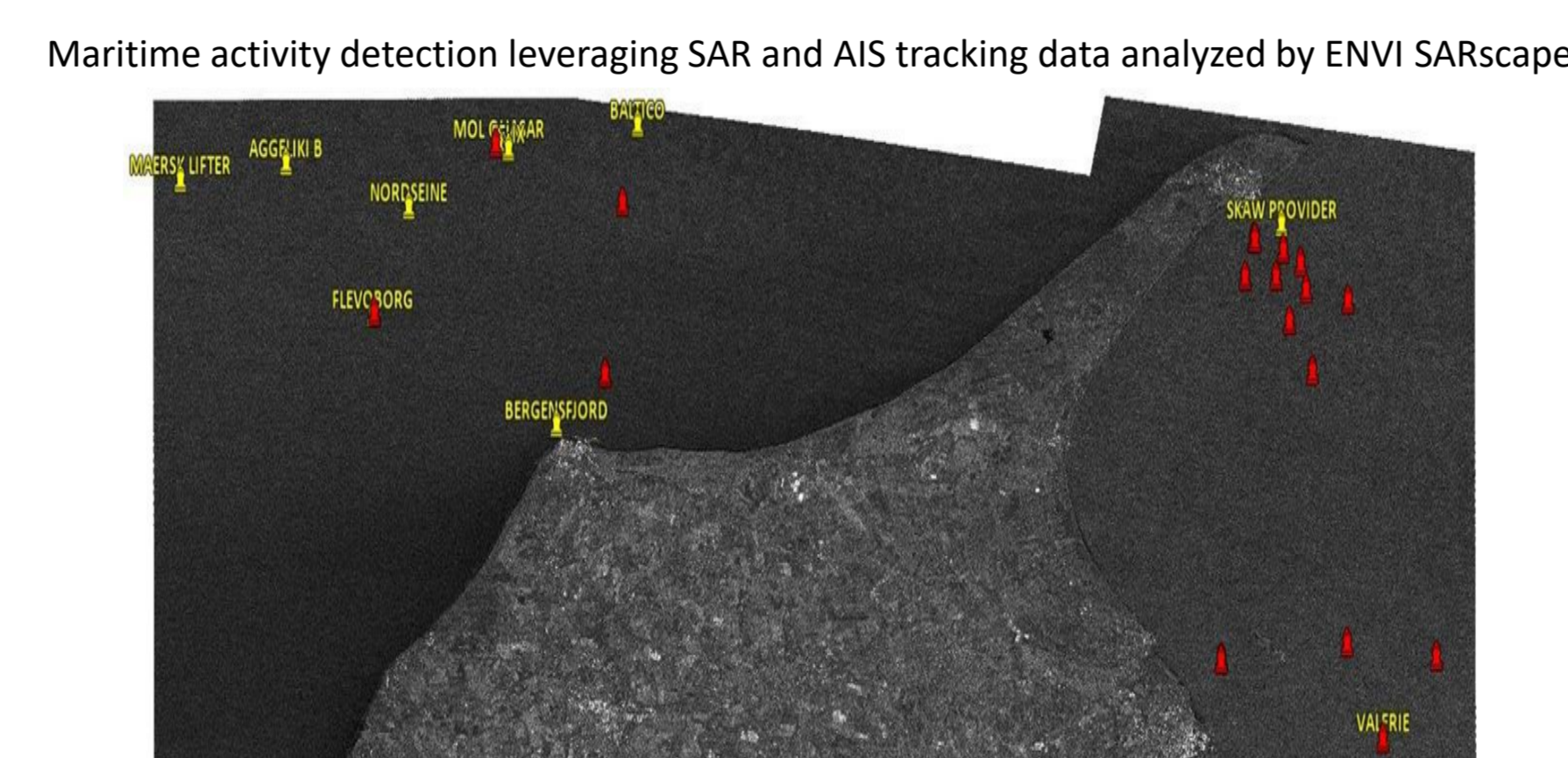
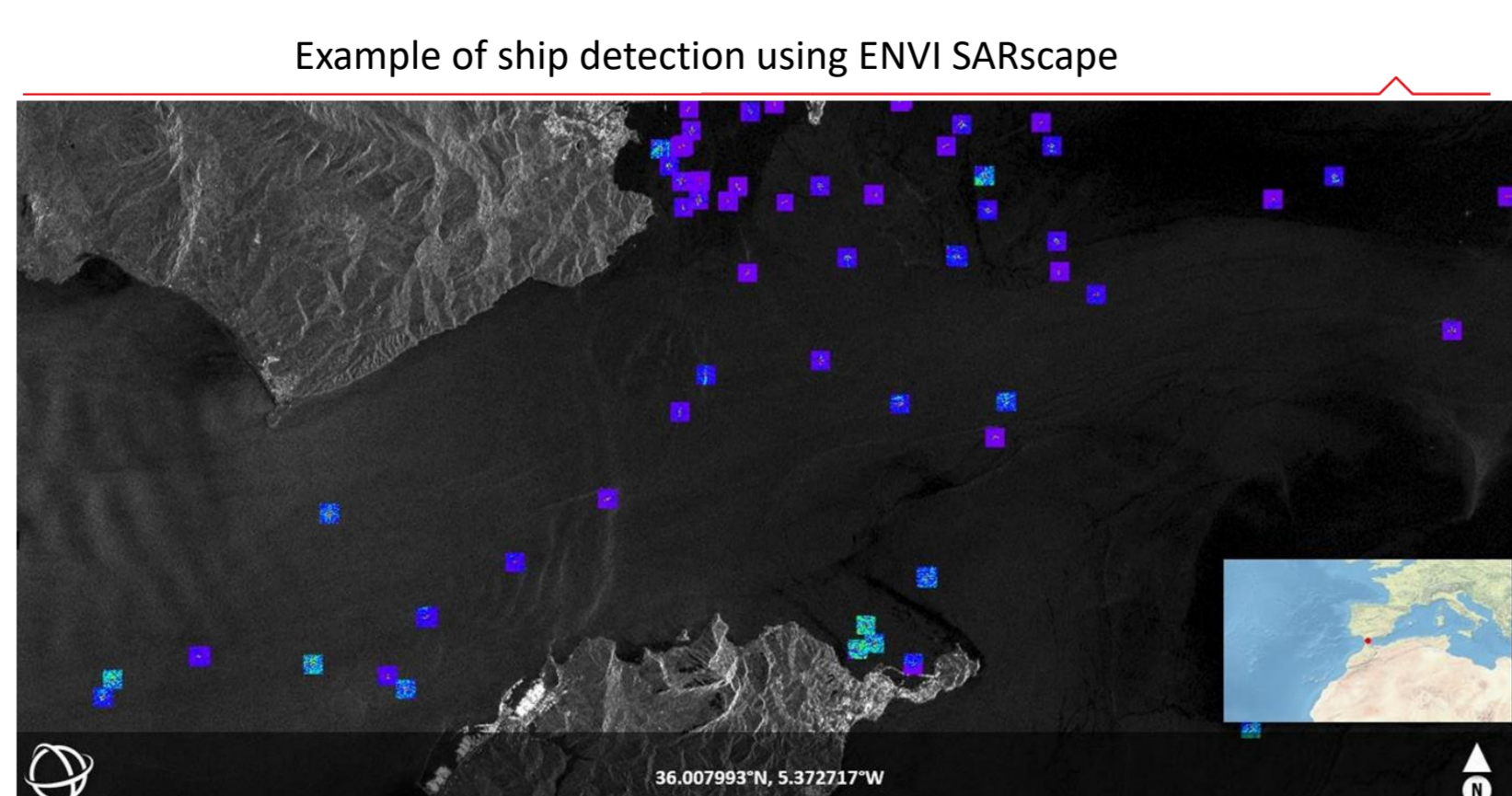
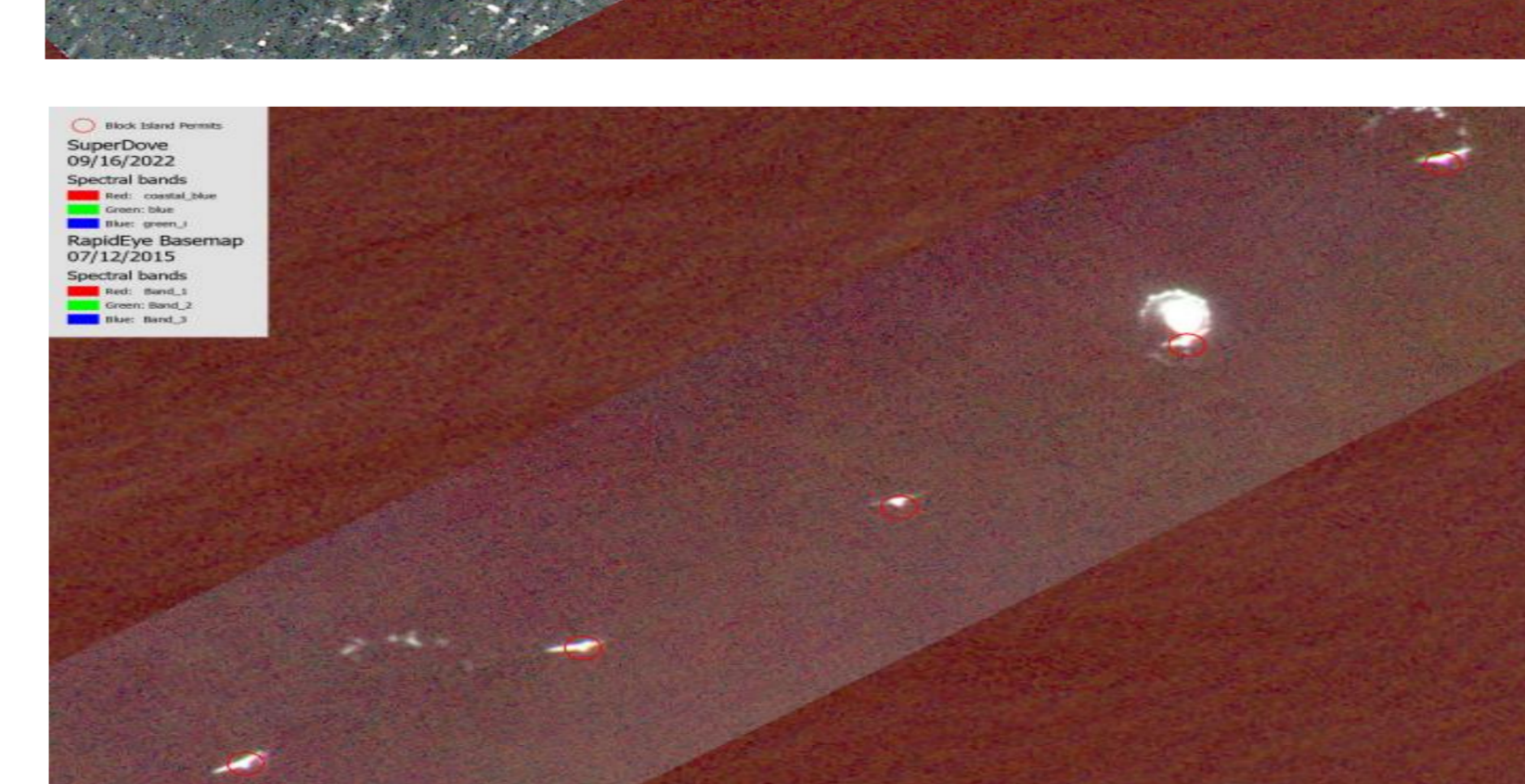
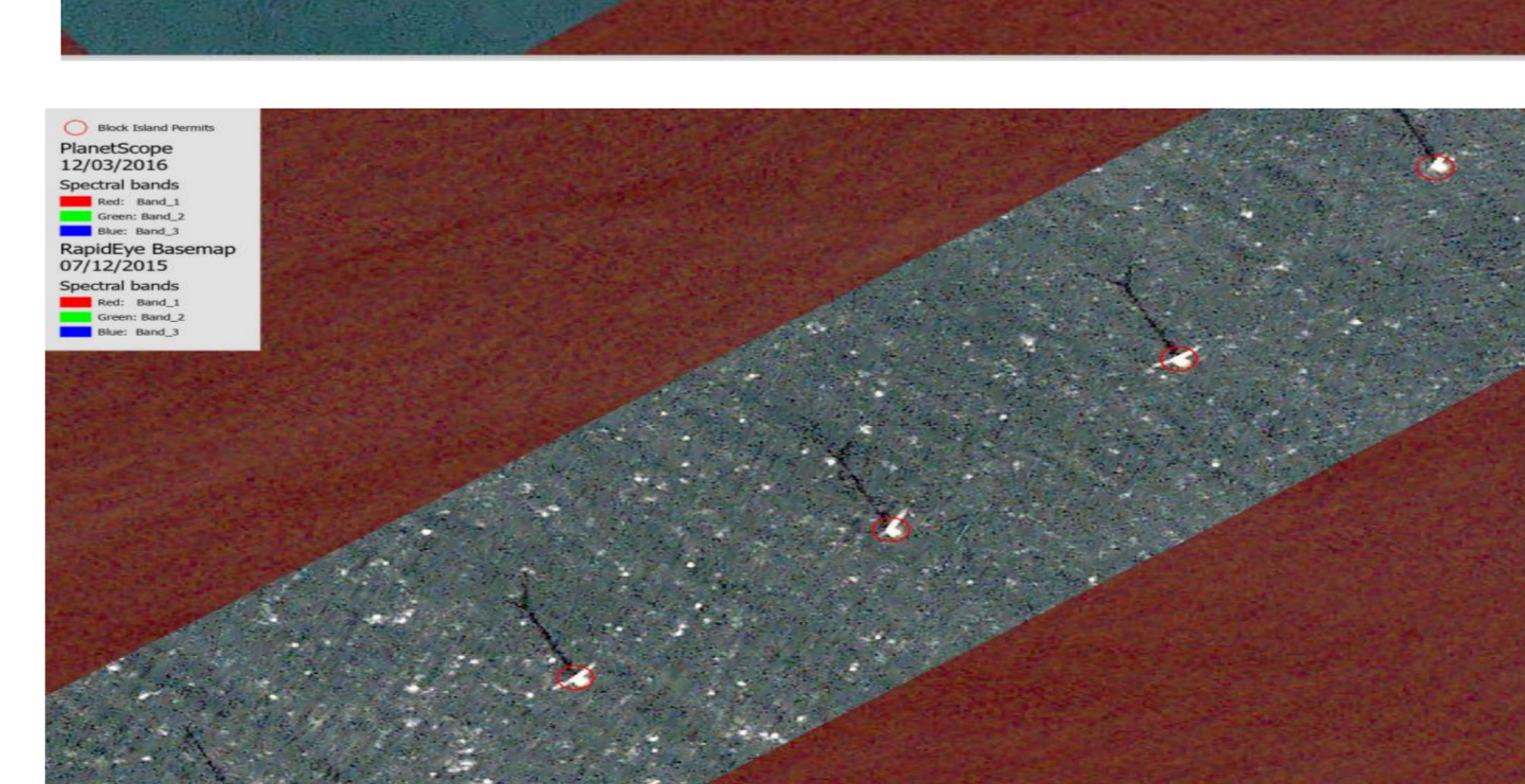
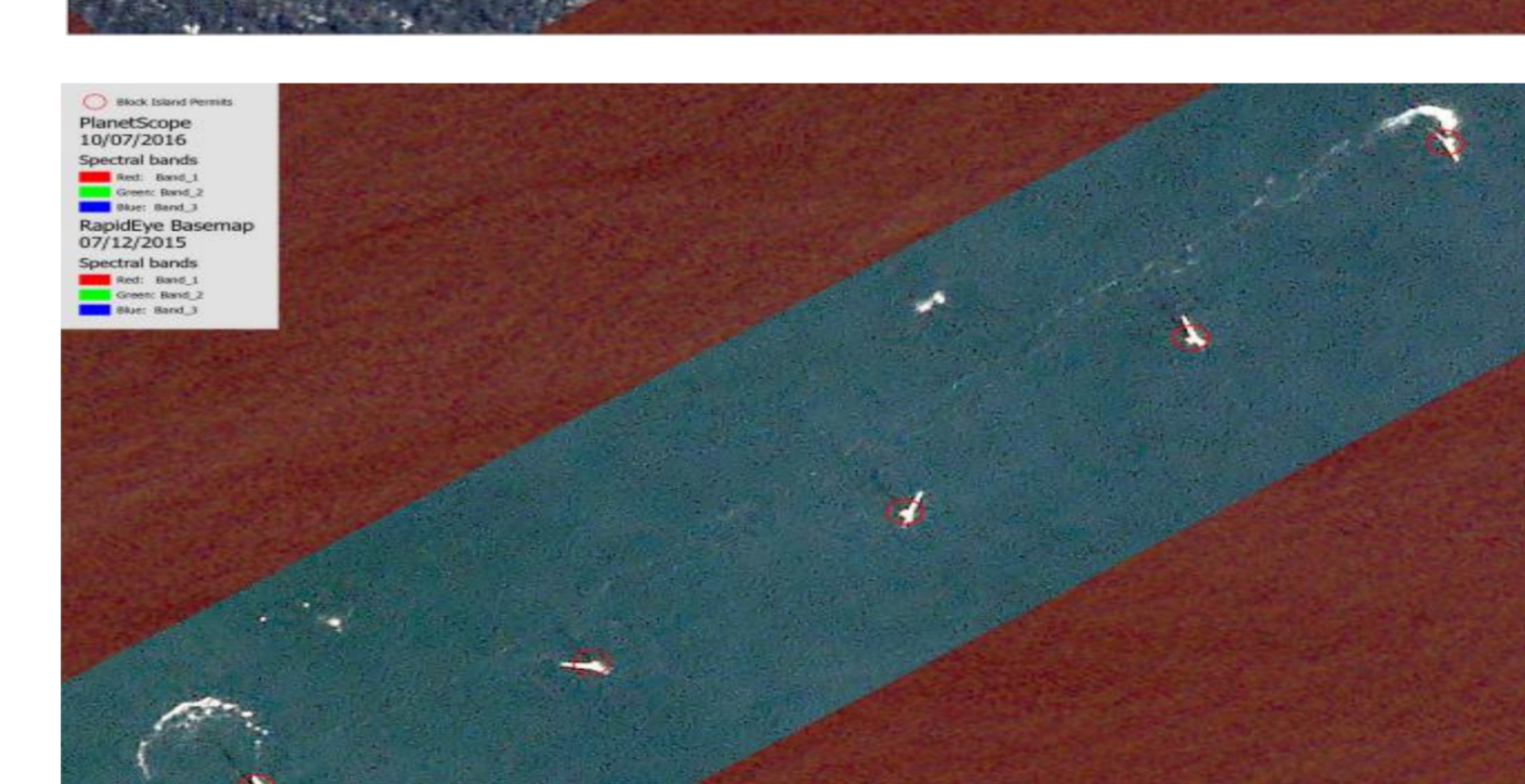
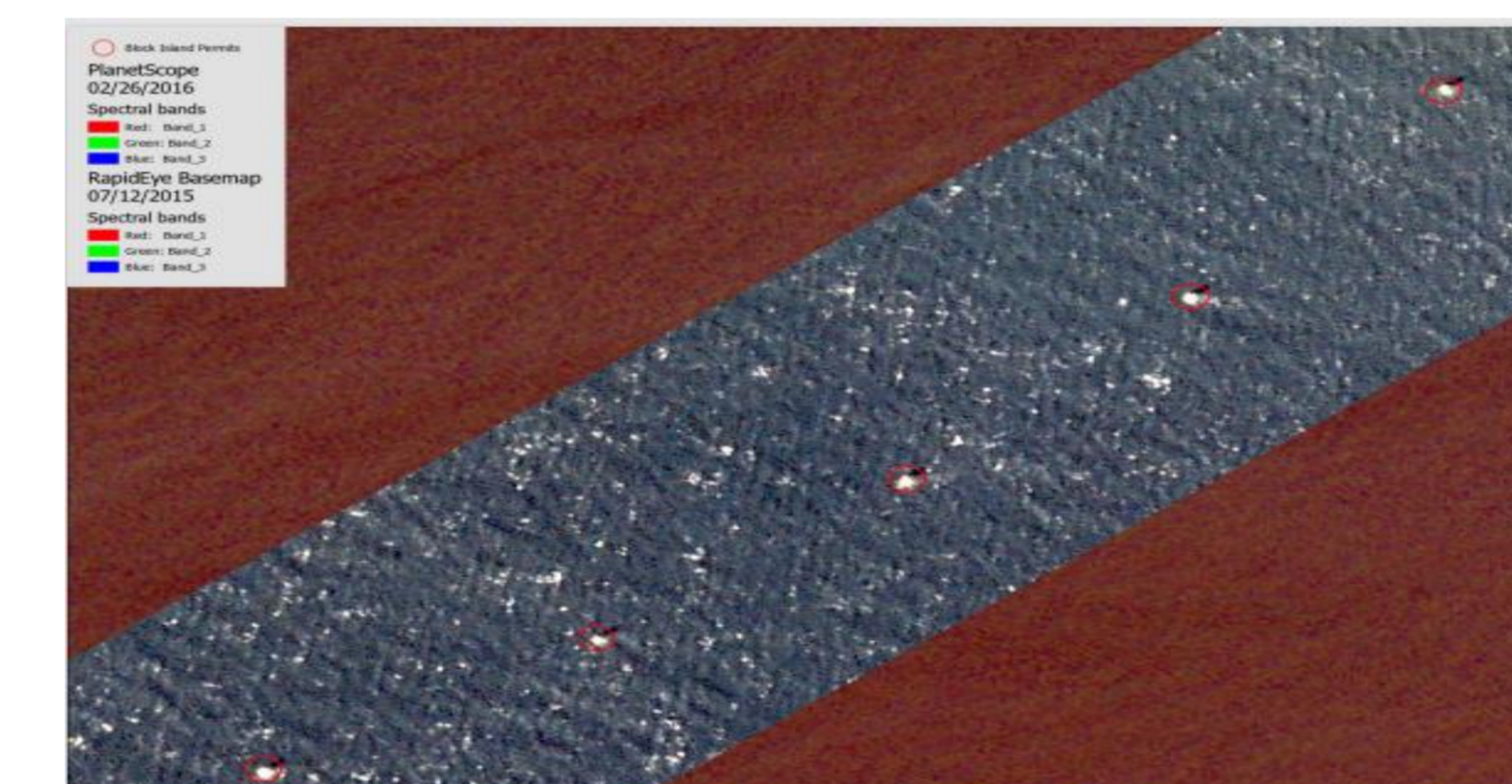
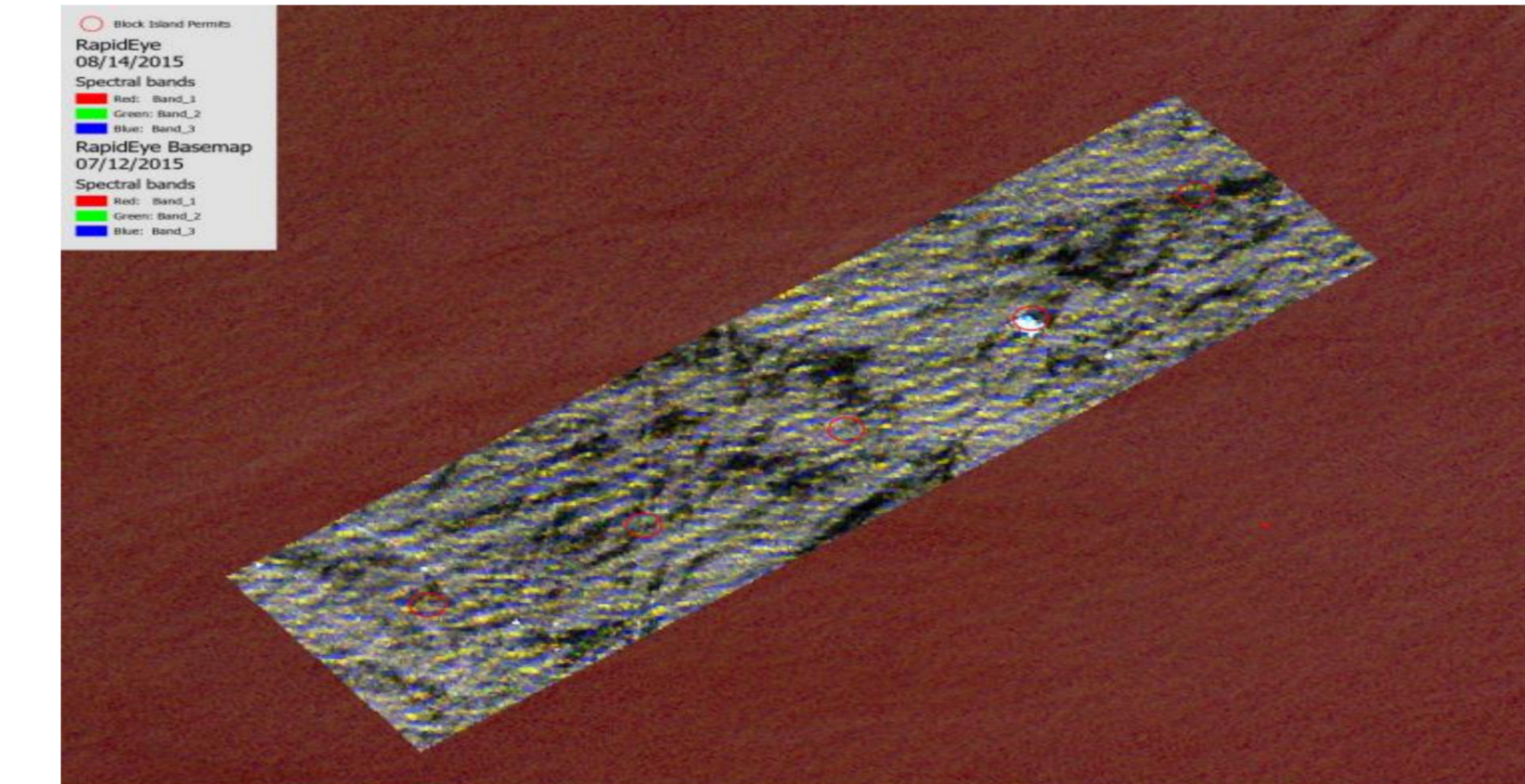
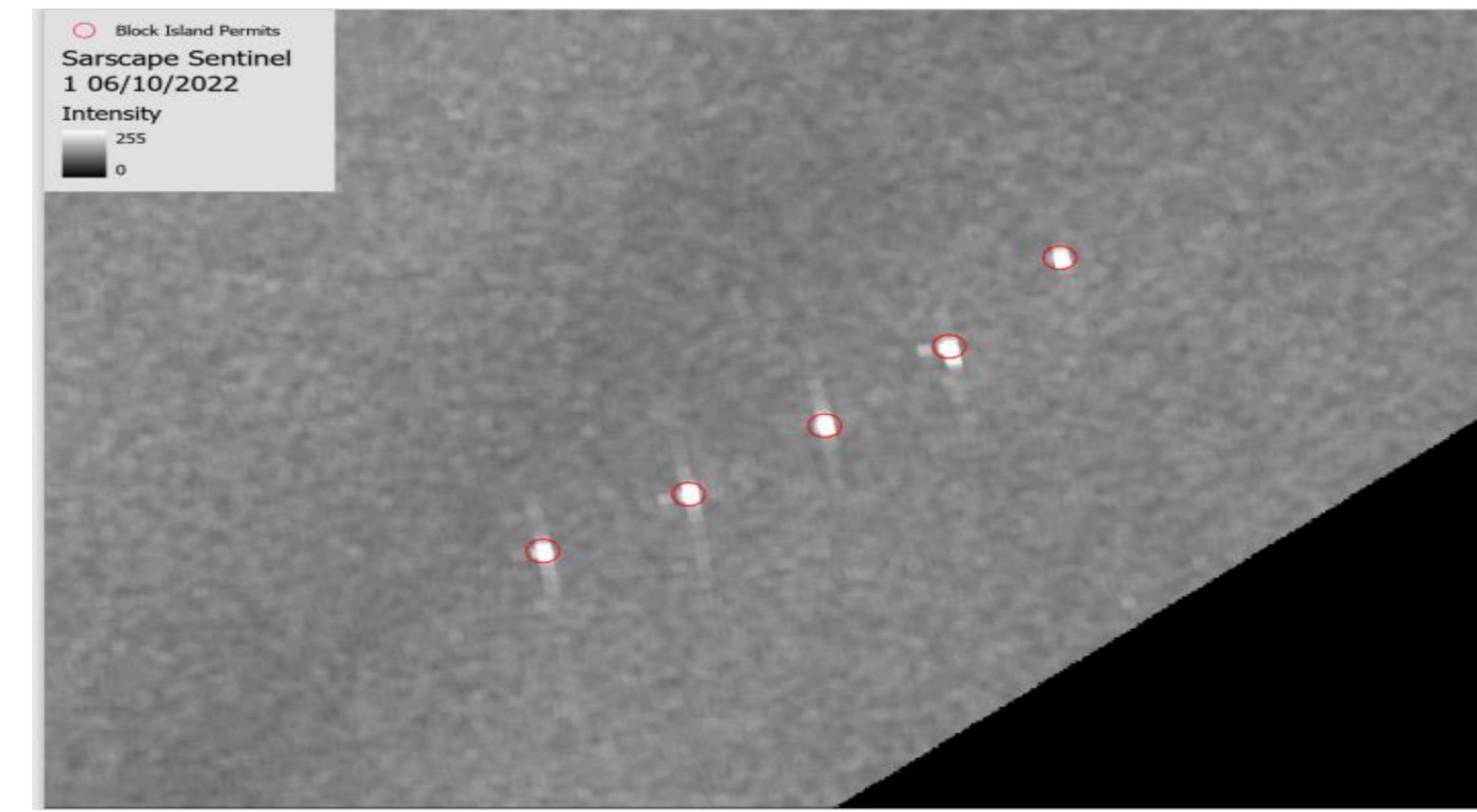
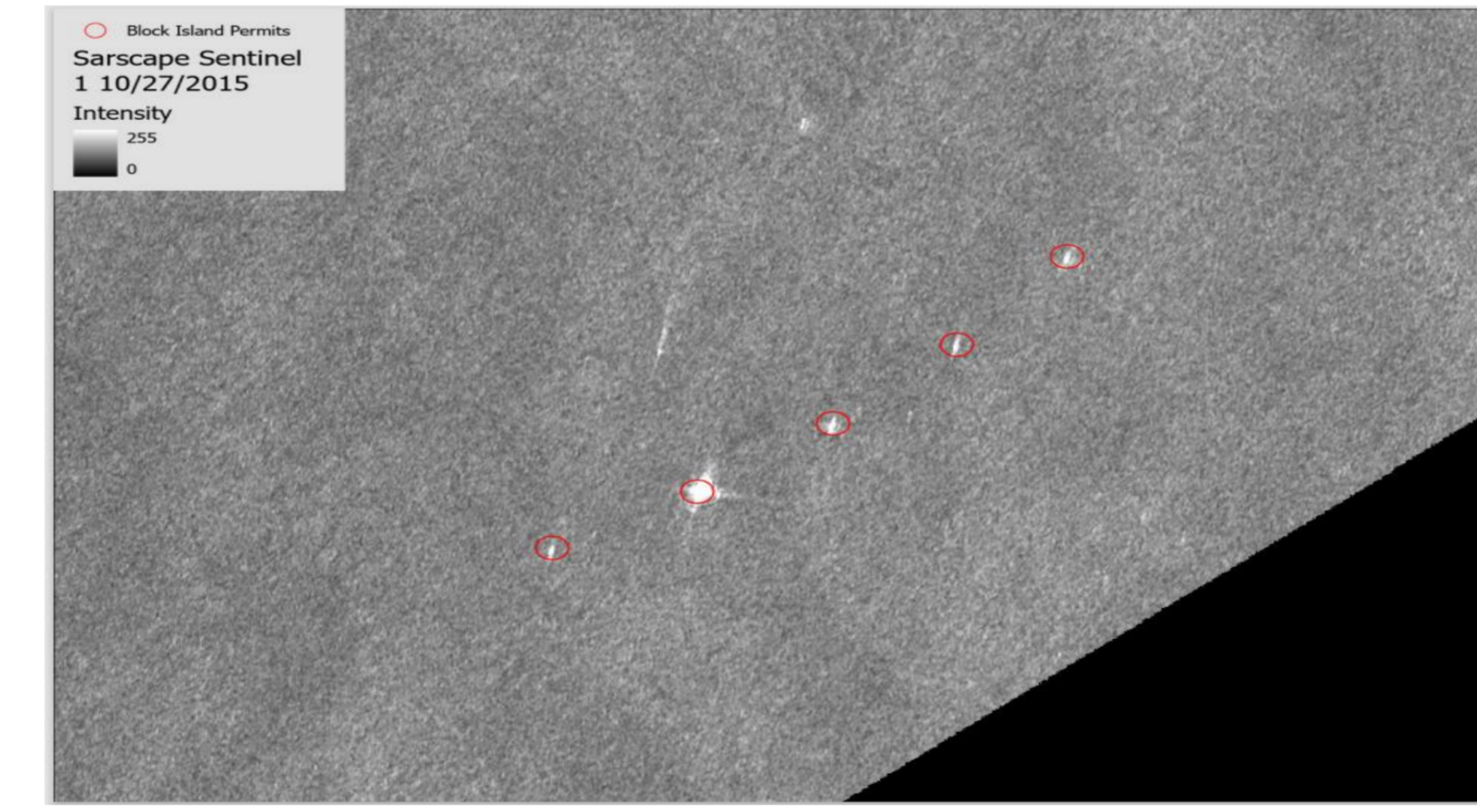
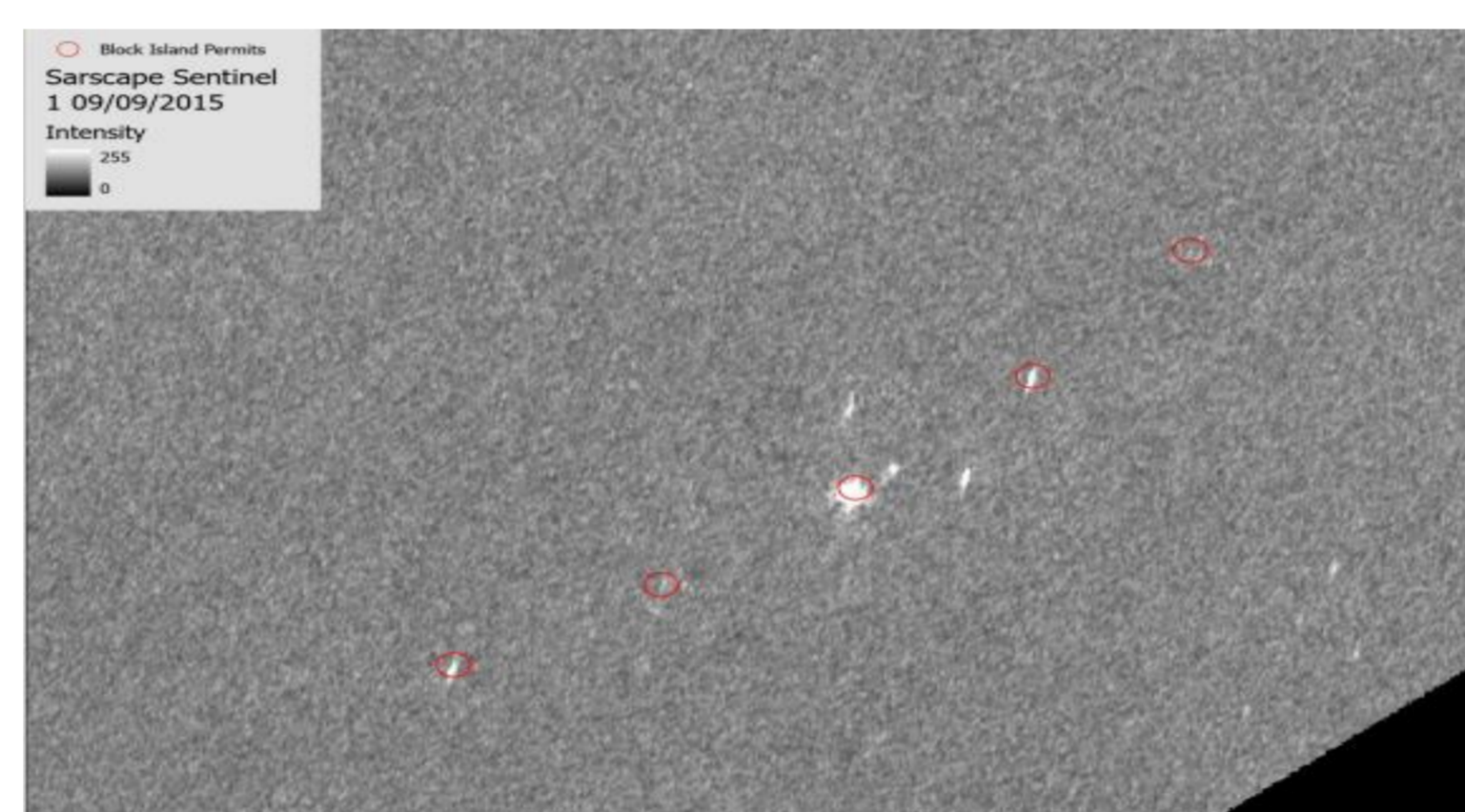
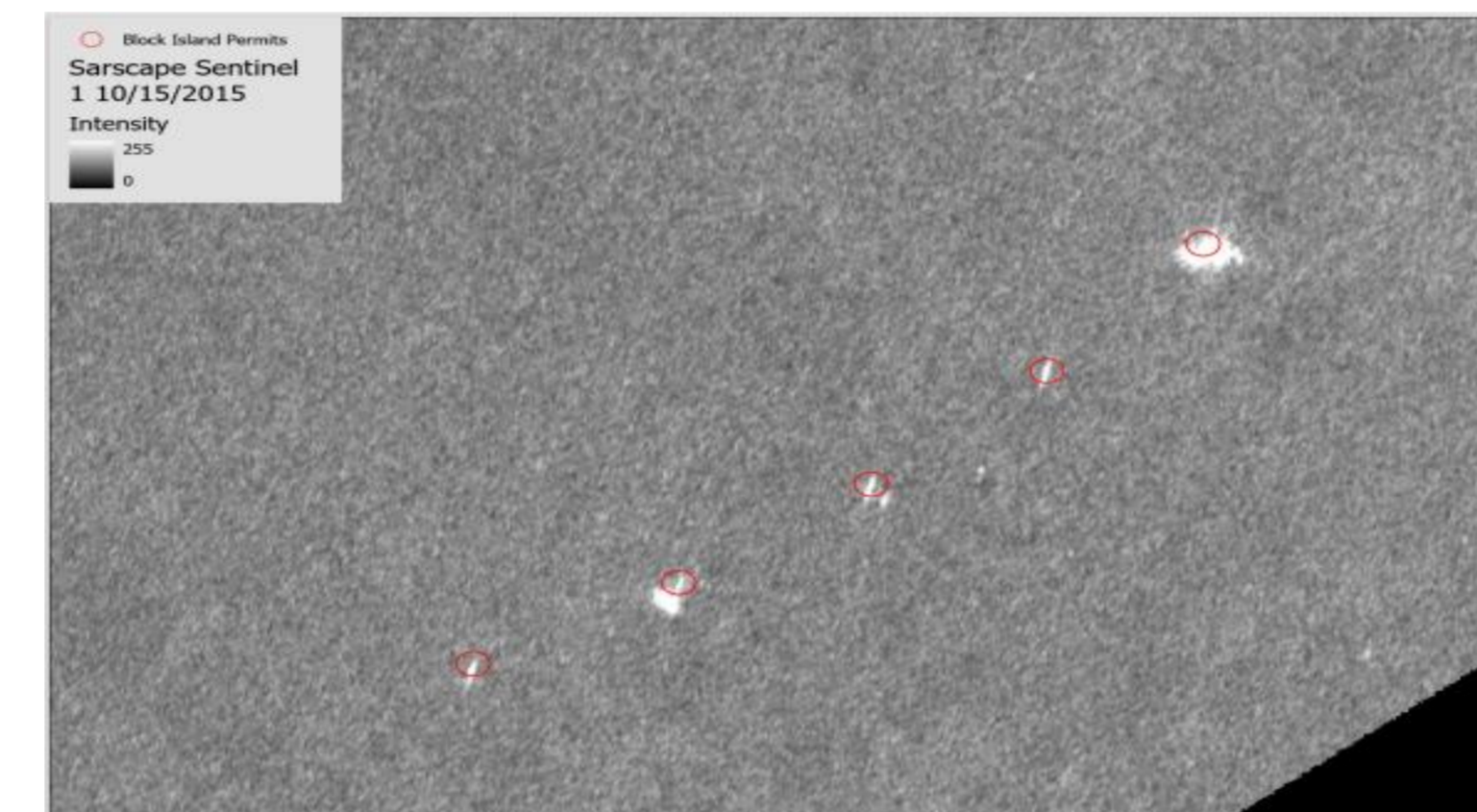
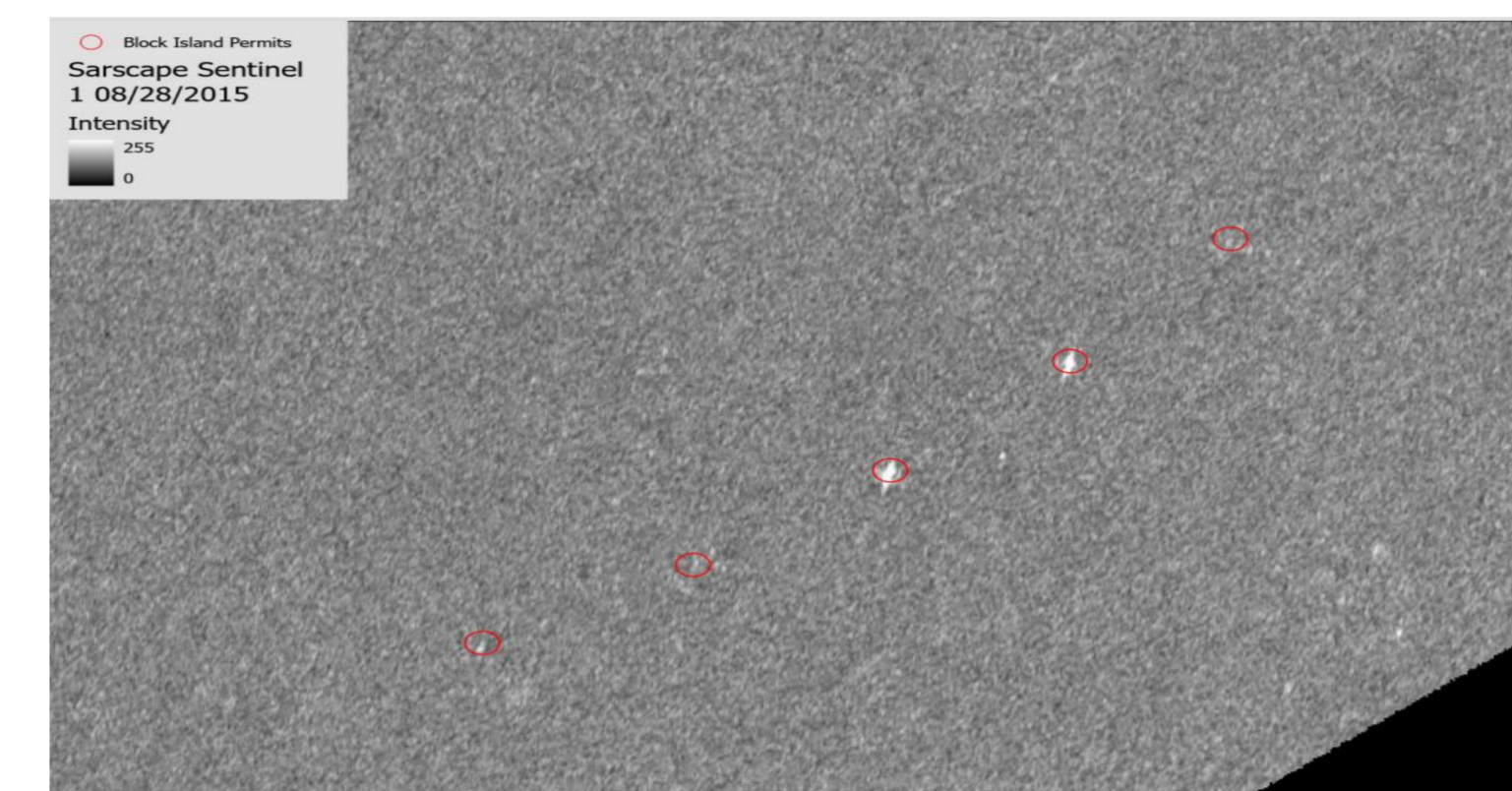
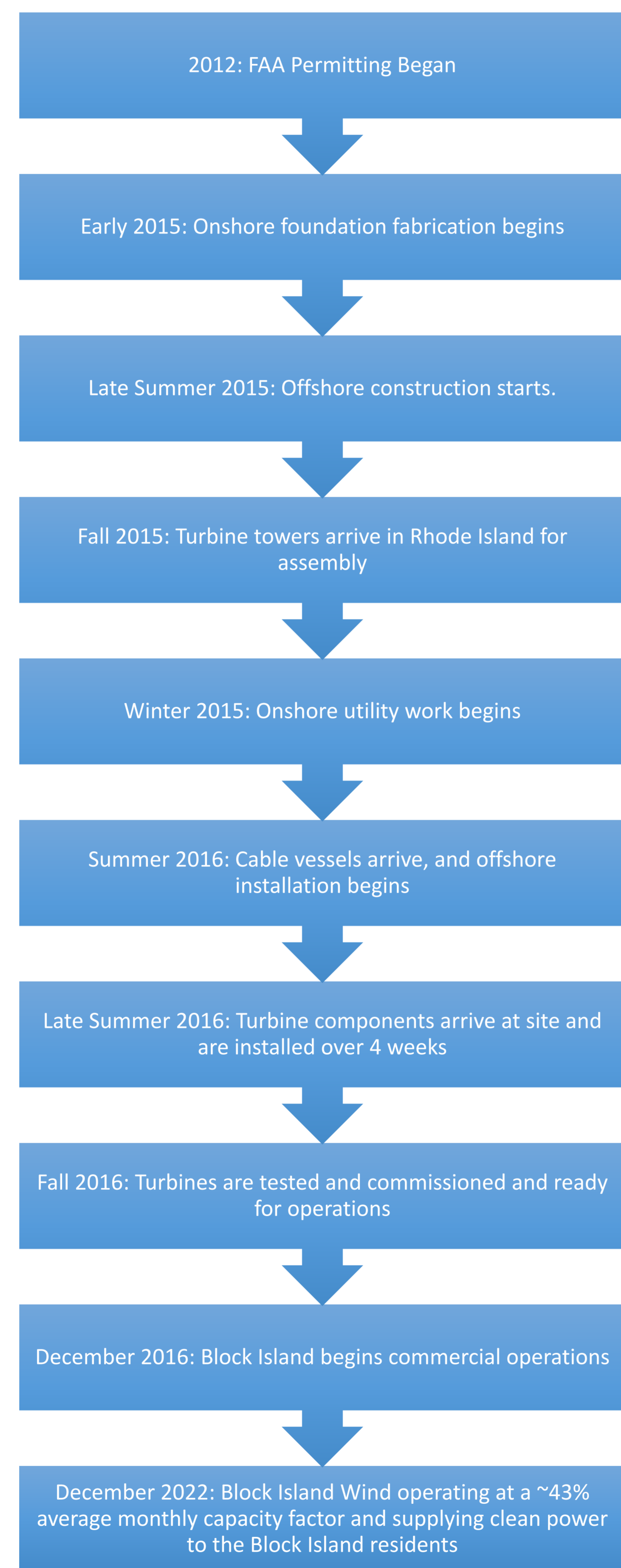
Planet Lab's PlanetScope Super Dove constellation include 200 satellites and counting that operate daily. Great for daily satellite imagery.

Planet Lab's SkySat constellation include 21 satellites and counting that operate daily. Great for high resolution imagery.



RESULTS

Block Island Wind Project Timeline



CONCLUSIONS

Using the combination of SAR and daily imagery for offshore wind energy development is an excellent method for near real-time asset tracking.

SAR data and daily imagery both provided accurate methods for tracking the development stages of an offshore wind project.

The use of SAR data analyzed by ENVI SARscape leveraged with AIS data proves to be a much more effective method for analysis and tracking of shipping patterns. As opposed to relying solely on traditional AIS tracking.

By integrating SAR data with daily imagery stakeholders, asset managers, lenders, insurance companies and government officials can get an accurate, near real-time understanding of the development process.

We hope this method of offshore project tracking will result in more efficient, sustainable development processes by provided comparable statistics on every US-based offshore wind project.

ACKNOWLEDGEMENTS

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