

Detection and Observation of Toxic Gulfweed in Martinique using SPOT 6/7

Case Study

Challenge

Detect the sargasse toxic seaweed pollution over Martinique coasts and respond to the environmental disaster.

Solution and Results

SPOT 6/7 imagery combined with a digital model of oceanic vegetation to detect the seaweed hubs and slicks.

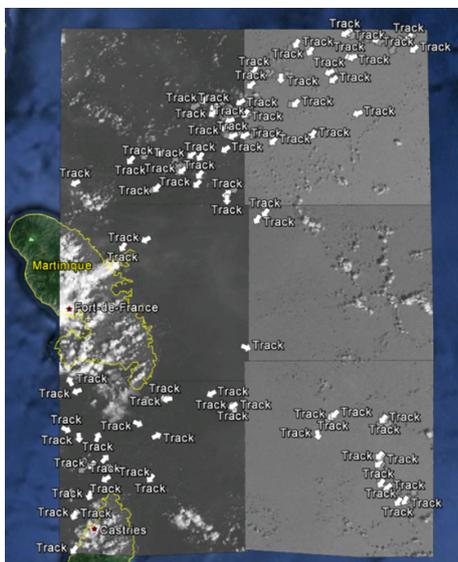
Benefits

Efficient management of human resources on the ground and coherent sanitary response provided by local authorities.

“Satellite capacities support monitoring, prevention and optimisation of targeting. They are essential to manage cost-efficiency of maritime means.”

Navy Lieutenant Sébastien Badel,
Programmes Officer.

Detection of sargasse hubs offshore of the Martinique coast.



Challenge

The gorgeous island of Martinique has been hit by a plague that was barely imaginable a few years ago, called sargasse. It is a gulfweed that not only rejects toxic hydrogen sulphide but is also incredibly pestilential.

Early October 2014, the local French Defence headquarter (FAA) sent soldiers to clean up the Martinique beaches after a new sargasse beaching, as it presented a serious hazard to public health. The situation is now getting critical: the ecological impact is tremendous, the local economic activity is hampered and tourism is collapsing. Satellite imagery of the ocean can provide high value information on the state of the oceans and their not so natural pollution.

The French Navy contacted Airbus to detect the seaweed with spatial tools in order to observe those quite disparate items offshore. Three crucial goals were at stake in the island: restoring public health, responding to the ecological disaster and, last but not least, resurrecting the international attractiveness of Martinique.

For Airbus, covering extremely large and similar water with enough resolution to successfully detect the dark-coloured seaweed was challenging.

Solution and Results

With its large swath and high resolution, SPOT 7 – in its phase of qualification – matched the criteria of the request. On 16 October, the satellite acquired 21,600 sq km with 1.5m resolution on which 163 sargasse hubs could be detected. On 18 October, 18,000 sq km were collected over which the Airbus DS expert team spotted 678 similar seaweed slicks. It was even possible to determine sargasse drift axes from West to South West.

Airbus teams went further by experimenting systematic detection of the seaweed with a digital model of oceanic vegetation. The objective was to map it, determine its surface and eventually estimate its volume. The combination of wind and stream models with weather forecast can constitute a toolkit to establish the route, the quantity and the estimated beaching date of sargasse.

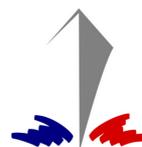
With these datasets and extracted information, local authorities will be able to efficiently respond to the ecological and economic crisis. Airbus also has the ability to develop an adapted regular solution in case the French Navy needs a frequent monitoring of the zone.

Applicability

With its large collection capacity and high resolution imagery, SPOT 6/7 can provide reliable data in a very short time to respond to ecological and environmental crises.

Organisation Involved

The French Navy is the maritime branch of the French Ministry of Defence. Its role is to ensure security on French Exclusive Economic Zone, which is the second largest in the world.



MARINE
NATIONALE

Benefits

- Establishment of route, quantity and estimated beaching date of sargasse: Airbus satellites responsiveness permitted quick access to a great quantity of reliable data on sargasse. SPOT 6/7 agility and capacity led to the daily collection of tens of thousands sq km for a given AOI.
- Reduction of the effective impact of seaweed beaching: with the maps in hand, the authorities will be able to deploy nets offshore and trap part of the seaweed before it reaches the coasts.
- Setup of a coherent sanitary response to the crisis, empowered by the satellite imagery information, the authorities will be able to efficiently manage human resources to clean the beaches and medical staff will help prevent illnesses from spreading to local populations and tourists.

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