

# Overview of New "Jason-Series Missions Applications Program"

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More than 25 years of discovery by altimetry missions – led by NASA, CNES, and other partners – has profoundly influenced science and its applications. To expand the impact of altimetry data, a new "Jason-Series Missions Applications" effort has begun to develop and test strategic ways to identify and engage existing ocean altimetry data users and to effectively transition individuals and groups who are "potential users" to being "practitioners."

## Jason-Series Missions Applications Program Plan

Jason-2, Jason-3, Jason-CS/Sentinel-6, and Future Ocean Altimetry Satellite Missions



*Audience – Those who have a clear and well-defined need or use for mission data products. Also, groups that may be unfamiliar with data and its capabilities but can potentially benefit from these resources.*

The "Jason-Series Missions Applications Plan" is a document that outlines existing and potential future activities, partners, and audiences. It promotes implementation of actions focused on engaging, encouraging, and developing targeted users of altimetry data.

## Jason-Series Missions Applications Thematic Resource Examples

### E-brochures

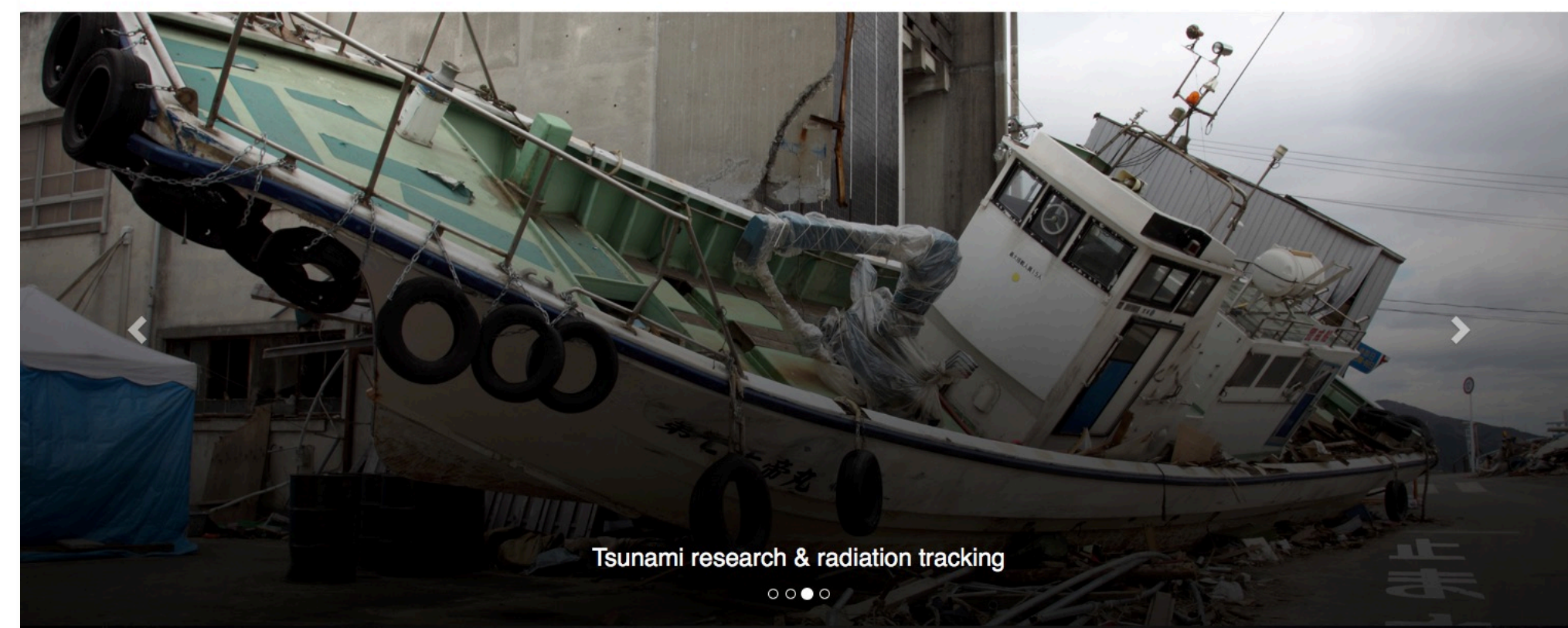


Coastal storms, hurricanes, and tsunamis are among the most devastating natural hazards in terms of property damage and loss of human life. These are just two of the many types of ocean hazards that have been studied using altimetry data. Direct altimeter measurements – such as wind speed and significant wave heights – are merged with derived information – such as tides and upper ocean heat content – to better understand the timing and impact of coastal storms and hurricanes. The integration of altimetry data into ocean-atmosphere computer models has not only added short-term prediction of ocean hazards such as storm surge, it has helped scientists assess the vulnerability of our coasts to longer-term changes in climate.

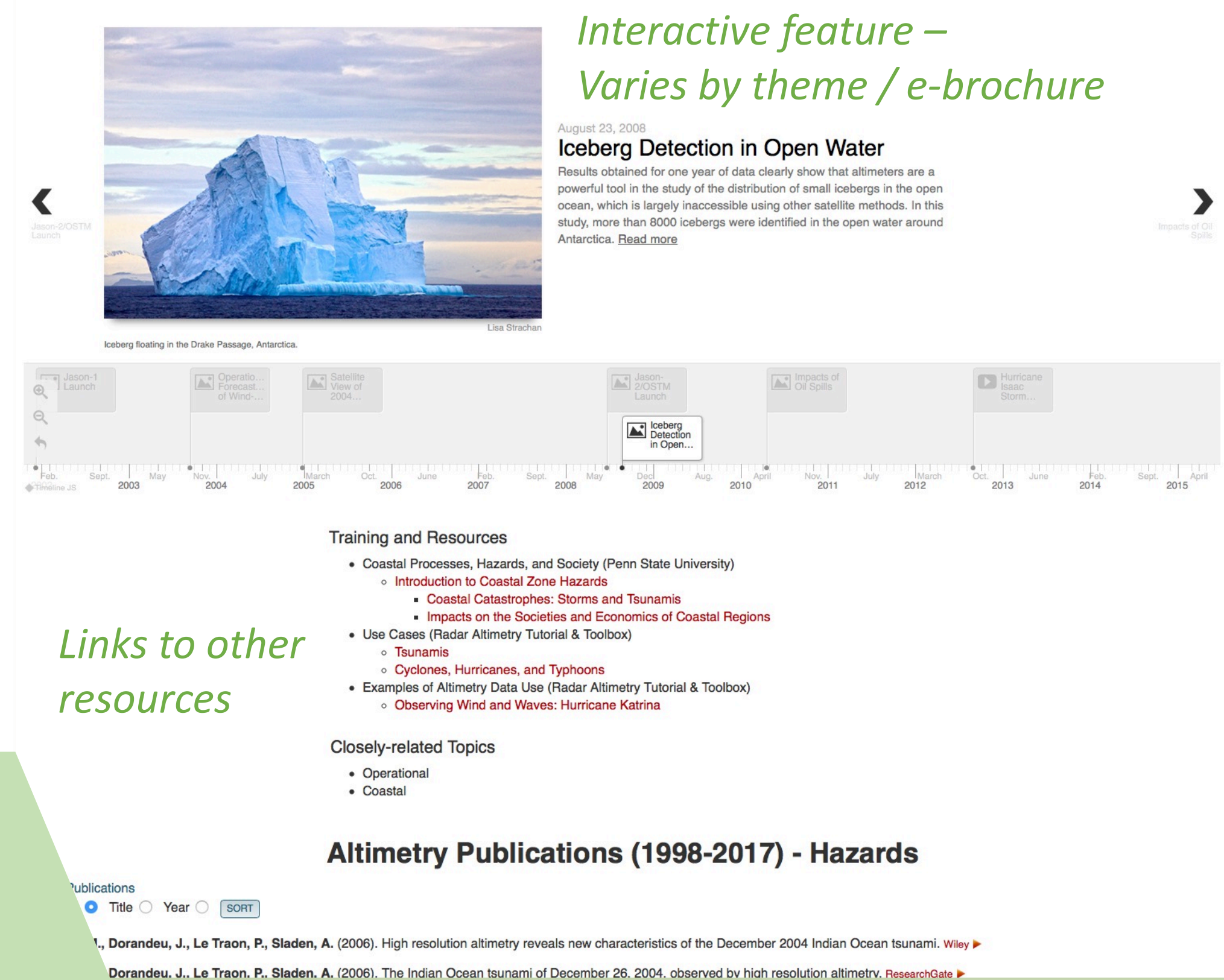
Unrelated to climate, tsunamis are another ocean hazard that have been studied using altimetry data. Triggered by vertical deformation of the seafloor, tsunamis can create deep-sea waves with potential to deliver enormous quantities of water when they reach the shore. Direct observation of tsunami waves is challenging due to timing – they travel at high speeds (around 800 km or 497 mi per hour) – and their relatively small amplitude at sea (i.e., a few to tens of centimeters). Nonetheless, altimetry data have improved models of how tsunami waves propagate through the ocean. And, interestingly, marine gravity and bathymetry data derived from altimetry are used to map seafloor features, including the faults that cause earthquakes.

Another major application of altimetry data to hazards research is prediction of the trajectories of materials carried by ocean currents. This methodology has been applied to track the spread of radioactive materials (e.g., from the Fukushima Daiichi Nuclear Power plant during the March 2011 Tohoku tsunami), oil spills (e.g., Deepwater Horizon event in April 2010), and more persistent types of marine debris such as ocean plastics.

Some of the applications that benefit from satellite altimetry data: *Slideshow (below) links to "one pagers"*



The interactive timeline below provides a brief history of how data from NASA Altimetry Missions have contributed to the study of hazards.



*Links to other resources*

*Interactive feature – Varies by theme / e-brochure*

*One pagers with links to publications*

*Links to abstracts >>*



## Altimetry Publications (1995-2017) - Ionosphere

*Sortable by author, title or year*



## Objectives of the Steering Committee:

- To provide inputs from altimetry science and Project people who have an interest in applied uses of the mission series data products, or are working with users outside of traditional research capacities;
- To provide guidance and direction on topical focus areas for an Applications Working Group;
- To help formulate a "road map" for development of future information products and training events that are aligned with an Applications focus from the altimetry mission time series; and
- To provide advice on expansion of or support for altimetry data product users/user communities.

A key element of this endeavor is an extensive review of the literature database hosted by the "Ocean Surface Topography from Space" website with entries from 1990 through present. Over 5,000 publications (through 2017) have been reviewed and placed in a thematic framework that aligns with societally relevant issues.

Bibliographies, summaries of select publications, infographics, and other online resources have been developed for each theme. This information has been used to create resources that inform broader audiences and help recruit partners who would support capacity-building opportunities for new altimetry data users.



*Note that only half of the one pagers are depicted here. Themes not shown: Climate, Coastal, and Hazards.*

Future activities include formulation of a road map for development of future products and events that are aligned with the thematic framework. Ultimately, the goal is to expand the altimetry applications user base by conducting training events designed to effectively reach potential data users and their associated decision makers.