

Airborne Mapping of Oceanic Thermal Anomalies (Animal Tracks, Boat Wakes and Large-Scale Phytoplankton Fine Structures)

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Abstract: On May5th 2013, a TSR-1800 (a state-of-the-art 1800-pixel real-time airborne thermal search and rescue system) was used on an experimental trial to collect daytime search-and-rescue research data near the coast of Tifino, British Columbia, Canada. Data were acquired over a ten square kilometer area at 25cm/pixel resolution with a temperature finesse of less than 25mK. During the trial, several oceanic thermal anomalies were tagged and geo-located. These anomalies included the control targets as well as unexpected very large-scale structures with intricate fine-scale features. These large-scale structures were not likely to be linked with the typical convection of thermoclines, but likely due to phytoplankton or algae plumes. The temperature variation within these structures ranged from 13C to 15C. Marine animal tracks/routes were easily detected within these structures and appeared as cooler features (~12C). The wakes of fishing boat were also observed as cooler features within these structures. Application of this type of state-of-the-art large-scale airborne thermal mapping over photo-biologically active open water may find utility in marine biology and oceanography.

Keywords: airborne mapping, ocean thermal imaging, marine animal tracks, ocean thermal anomaly, thermoclines