

The followings are published in Vol.7(1).

Solar radiation transfer in the surface snow layer in Dronning Maud Land, Antarctica

Onni Järvinen*, Matti Leppäranta

Spectroradiometer measurements of solar radiation (the broadest band used 400–900 nm) were performed above and inside the surface snow layer in western Dronning Maud Land, Antarctica, during the austral summer of 2009–2010. The vertical distributions of transmittance and the extinction coefficient were examined from the surface to a depth of 30 cm. Physical characterization of the snowpack included measurements of thickness, density, hardness (hand test), liquid–water content, and grain size and shape (from photographs of grains). The transmittance was

A Spectral Index Ratio–based Antarctic Land–cover Mapping Using Hyperspatial 8–band WorldView–2 Imager

Shridhar D. Jawak*, Alvarinho J. Luis

This study evaluates the potential of 8–band high resolution WorldView–2 (WV–2) panchromatic (PAN) and multispectral image (MSI) data for the extraction of polar geospatial information. We introduce a novel method based on a customized set of normalized difference Spectral Index Ratios (SIRs), incorporating multiple bands, to improve the accuracy of land–cover mapping in the Antarctic. Most recently available WV–2 data are classified into land–cover surfaces such as snow/ice, water bodies, and landmass using the customized normalized difference SIRs. A novel multi–fold methodology is used to evaluate the effect of pan–sharpening algorithms on spectral characteristics of satellite data, and on subsequent land–cover mapping using an array of SIRs. A set of existing pan–sharpening algorithms was implemented in order to fuse PAN with MSI data, followed by estimation of multiple SIRs to extract target land–cover classes. These algorithms were compared on the basis of their effectiveness in extracting target classes using a defined set of SIRs. Our results indicate that the use of 8–band WV–2, customized SIRs, and appropriate pan–sharpening can greatly improve the extraction of land–cover information.

Zonal variations in abundance and body length of chaetognaths in the 140° E seasonal ice zone during the austral summer of 2001/02

Makoto Terazaki, Kunio T. Takahashi*, Tsuneo Odate

Time-series observations of chaetognaths were carried out during four cruises along the 140° E transect between 61° S and 66° 28'S from November to March in the 2001/02 austral summer. Three species – *Eukrohnia hamata*, *Sagitta gazellae* and *S. marri* – occurred in the samples between 0 and 150 m. *E. hamata* was the most dominant species comprising between 89.6 and 100% of the chaetognath population, followed by *S. gazellae* (0–5.7%). There were large differences in the abundance and size frequency distribution of body length of *E. hamata* between the north and south of the Southern Boundary of the Antarctic Circumpolar Current (SB-ACC) which was located between 64° S and 65° S. For *E. hamata*, low abundance and large sized animals (22–24 mm) occurred south of the SB-ACC. A possible reason could be that the breeding season in waters north of the SB-ACC may be early spring and summer. On the other hand, low reproduction was recognized by low the abundance of *E. hamata* and few occurrences of juveniles south of the SB-ACC (65° S). The result of a general comparison suggests that the abundance of chaetognaths along the 140° E transect has decreased during the 20 years since 1983.