

EARTH OBSERVATION SYMPOSIUM (B1)  
Water resources management (6)

Author: Dr. Tal Feingersh  
Israel Aerospace Industries. Ltd., Israel

Mr. Stefano Signorile  
Telespazio S.p.A., Italy  
Mr. Ron Nadler  
Elbit Systems, Electro Optics, ELOP Ltd., Israel  
Dr. Yael Efraim  
Israel Aerospace Industries. Ltd, Israel  
Mr. Elad Sagi  
Israel  
Dr. Maria Lucia Magliozzi  
Italy  
Dr. Michael Gilichinsky  
Israel  
Dr. Keren Pollak  
Israel

## WATER QUALITY PRODUCTS OF THE SHALOM MISSION

**Abstract**

SHALOM is the first Space-borne Hyper-Spectral system that opens opportunities for a commercial Hyperspectral mission. SHALOM is a joint collaboration between the Italian and Israeli space agencies (ASI ISA). SHALOM is providing products from a sun-synchronous orbit of 640km, high ground resolutions (10m Hyperspectral, 2.5-5.0m Panchromatic) a daily area coverage of 200,000 km<sup>2</sup>, 4-days revisit time, precise geo-location of up to 15m, and distribution of scientifically validated added value products to end-users, within 7 days.

The SHALOM system will provide over 70 added value product layers at panchromatic ground resolution, supporting a variety of decisions. In between these, a specially challenging product is made of the group of information layers called “Marine and aquatic quality and productivity indicators”. These interpret the following parameters useful for the characterization of inland, coastal and marine waters:

- Phytoplankton Chlorophyll Concentration Map
- Harmfull Algal Blooms Map
- Cyanobacterial Phycocyanin Concentration Map
- Suspended Particulate Matter Concentration Map
- Turbidity Map
- Colored Dissolved Organic Matter Absorption
- Submerged Vegetation Species Map

- Spills Map

It is obtained by processing geolocated surface reflectance data, or georeferenced surface reflectance data if required for accuracy purposes.

The product is relevant to environmental water studies as well as to water resource management, providing a synoptic view of the spatial distribution of different biological, chemical and physical variables of both the water column and, if visible, the substrate. SHALOM will assist the task set by the European Union Water Framework Directive (termed “WFD 2000”) for inland and coastal water monitoring, which requires the member states to take actions in order to reach a good ecological status in inland and coastal waters by 2015. This task involves characterization of the specific trophic category of aquatic systems and implementation of monitoring systems to verify the ecological status.

Currently, the limited radiometric and spectral resolution of commercial multi-spectral sensors and the limited spatial resolution of the superspectral spaceborne missions restrict water quality monitoring strategies to field and airborne imaging spectrometers.

Further research and development of information extraction is on-going, in support of SHALOM mission’s products and their quality.