NORTHWEST SARDINE SURVEY
12 Bellwether Way, Suite 209
Bellingham, Washington 98225

Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, OR 97220-1384

Satellite Sardine Imaging Report
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Since the Aerial Survey began two years ago it was apparent that photographs taken by satellites might provide an additional and efficient source of valuable data. The present method of determining the surface areas of sardine schools is done with digital cameras taking pictures from small airplanes at 4,000 feet. This is an acceptable method but it does have limitations.

The speed of a single engine aircraft makes covering a large portion of the ocean in a short amount of time difficult. In order to have a synoptic collection of data, say from the Pacific Northwest to Southern California an airplane flying survey grids may take several days or if hampered by weather, even weeks. By comparison, a satellite can travel our entire coast in a matter of minutes.

The amount of ocean surface area being photographed with airplanes can be greatly increased by adding satellite imagery. It may even be possible to cover the entire Pacific Coast completely eliminating any need for statistical extrapolation.

The Northwest Sardine Survey contacted GeoEye, a satellite company that provides images for public and private uses. After viewing samples of their images it was obvious that sardines could be photographed from a satellite. A test was set up with the help of Spatial Imaging Solutions to photograph an area of known sardine abundance on the Southern Washington coast. With a weather parameter of 90% clear skies and low water vapor concentration, the satellite’s computer was programmed to capture a series of images. On August 23, the IKONOS satellite took the images from 425 miles high.
Dark portion = area photographed by IKONOS on Aug 23rd
The images captured by the IKONOS satellite were delivered and converted to TIFF files. After applying adobe filters, the same ones used for enhancing photos from the Aerial Survey, the satellite images showed many sardine schools.
The above picture is a very small portion the actual area photographed by the satellite. Due to the extensive size of the area photographed it is not possible in this report to show the image in its entirety. After further development and enhancements, the sardine school surface areas will be measured as was done for the Aerial Survey.

Satellite imaging is a time proven technique to accurately measure earth's objects such as buildings, roads and forests. The satellite science and analytical software have been proven for decades and imagery calibration has previously been accepted by science. Applying this achievement to the measurement of sardine schools will be straightforward.

NOAA fisheries scientists need to consider being involved with satellite imaging for future sardine assessments. The satellite is a more reliable and cost efficient method of predicting real world conditions. The cost of trawl surveys when compared to aerial surveys is substantial, but when compared to the cost of satellite imaging, trawling is vastly more expensive and provides uncertain results. The past assessments of sardine abundance have not correctly predicted the biomass and the new Aerial Survey proves this case.

Industry will continue to develop and test satellite imagery if NOAA doesn’t takes the lead. However, it is preferred that this endeavor be conducted by people who are accomplished scientists. Fisheries management and industry will be well served by NOAA ‘s participation in this project.

Jerry Thon
Northwest Sardine Survey
GeoEye  21700 Atlantic Boulevard  Dulles, VA 20166  Phone: +1.703.480.7500  Fax: 703.450.9570  E-mail: info@geoeye.co

Spatial Image Solutions, Jeff Campbell, Bend OR 541-388-8868  jcampbell@spatial-solutions.com