

ChloroGIN

Chlorophyll Globally Integrated Network



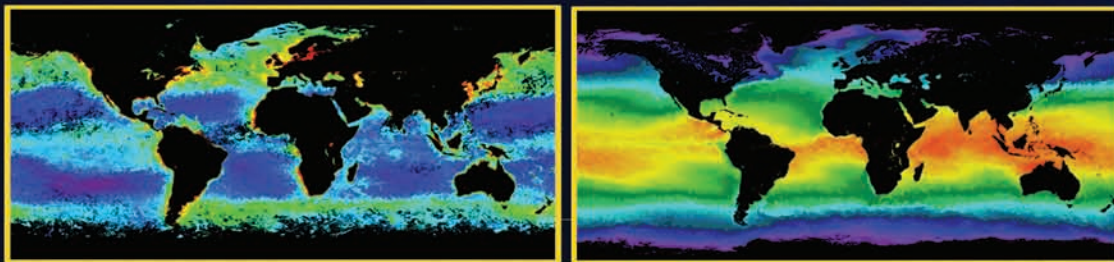
ChloroGIN

Vision:

ChloroGIN is an international network for promoting ocean colour and related satellite and in-water observations to assess the state of marine, coastal and inland water ecosystems for the benefit of society.

Products:

A series of ocean-colour and sea-surface temperature products targeting coastal zones on a world scale: data are currently collected from a variety of sensors for ocean colour and sea-surface temperature.



Remotely-sensed chlorophyll (left) and sea surface temperature (right).

Photo Credit: NASA

Photo Credit: Zhihua Mao, Second Institute of Oceanography, Hangzhou, China



Volunteers help clean up an algal bloom in China.

Societal Benefits:

Ecosystems: observing the global ecosystem

Health: harmful algal blooms

Climate: long-term monitoring and modelling

Water: water cycle, water quality

Agriculture: aquaculture and fisheries

Biodiversity: phytoplankton community structure

Weather: biological-physical coupling

Disasters: unusual and extreme events

ChloroGIN Objectives:

To develop tools and techniques for analysis of ChloroGIN products (to assess ocean, coastal and inland water ecosystems; evaluate status of fisheries; monitor regime shifts; study climate change and variability) as a basis for policy making and implementation;

To provide time series of ecosystem indicators for management of fisheries, aquaculture, coastal zones and inland waters;

To help train a new generation of scientists with the skills to develop and maintain the ChloroGIN vision;

To liaise and cooperate with other Earth Observation groups regionally, nationally, and internationally;

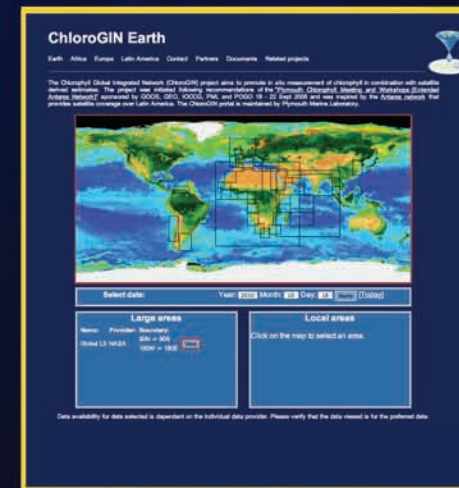


ChloroGIN participants at a meeting in Kochi India, February 18-19, 2010.

To communicate widely ChloroGIN products of ecosystem state to potential users in society and in policy-making bodies;

To develop and supply value-added products needed for management by local authorities and governments;

To support satellite observations with *in situ* observations for ground-truthing and characterising sub-surface water properties for assessing pollution, ecological status and potential for human use;



ChloroGIN website

To expand activities to freshwater by developing a global operational freshwater quality monitoring system based on satellite data and *in situ* time series stations in selected lakes.



Photo Credit: NASA

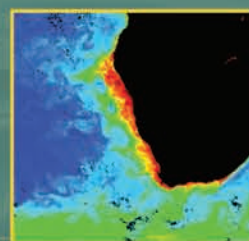
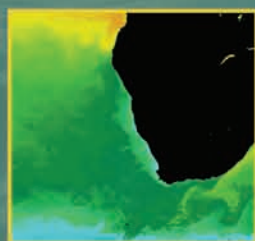
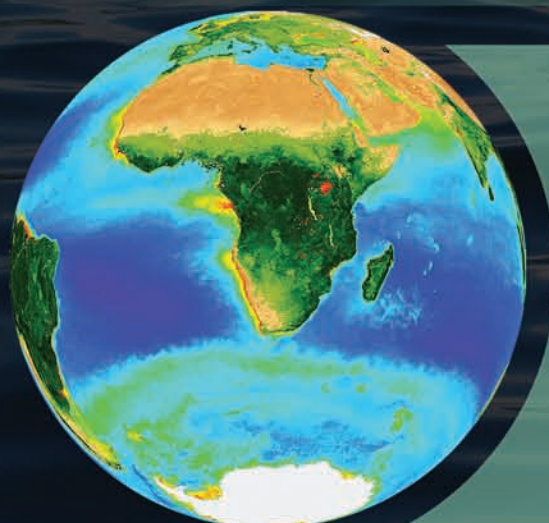
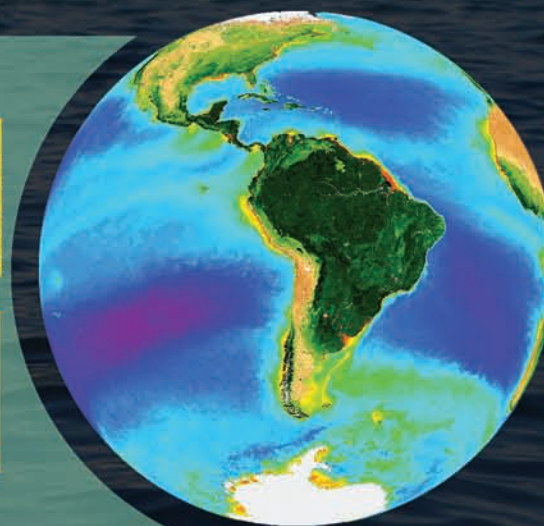
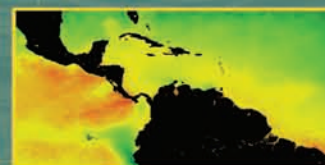
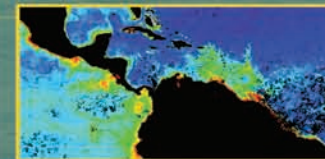
A phytoplankton bloom in the Great Lakes.

Latin America (Antares)

ChloroGIN-ANTARES is a Latin-American network created in 2003, with the main goal of studying long-term changes in coastal ecosystems. It covers Central and South America, including the Caribbean and Mexico. Current participating countries are: Argentina, Brazil, Chile, Colombia, Mexico and Venezuela.

ChloroGIN-ANTARES provides coastal *in situ* and satellite data (sea-surface temperature and chlorophyll) from around Latin America to members of the network and to the general public. Satellite data from around Latin America are processed daily and disseminated through the Antares webpage by the Institute of Marine Remote Sensing at the University of South Florida.

Chlorophyll concentration (top right) and sea-surface temperature (bottom right) around northern Latin America, MODIS April 2010



Sea-surface temperature (left) and chlorophyll concentration (right) around Southern Africa, MODIS April 2010

Africa

- Ecosystem-based Resource Management: ocean colour for total allowable catch estimates for Namibia; State-of-Environment reports for South Africa
- Early Warning and Disaster Management: harmful algal bloom detection
- Real-time monitoring of Benguela Niños: early warning and improvement of drought forecasting
- Real-time monitoring of hydro-climatic variability (droughts)
- Regional dissemination centres in Africa: DevCoCast; Marine Remote Sensing Unit; Europe-Africa Marine Network; OceanSAfrica; African Marine Information System

Indian Ocean

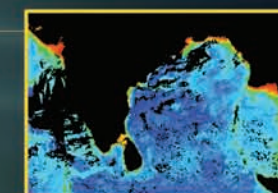
Global Ocean Observing System Regional Alliance in Indian Ocean (IOGOOS) endorsed the Indian Ocean ChloroGIN Project as one of its pilot projects and identified the Indian National Centre for Ocean Information Services (INCOIS) as its coordinating and implementing agency.

IOGOOS Members endorsed the ChloroGIN Project at the IOGOOS Annual Meeting in Phuket, December 2007, requesting the IOGOOS Secretariat and INCOIS to provide real-time satellite products for coastal regions of Tanzania, Iran, Kenya, Sri Lanka, Maldives, Oman and Thailand.

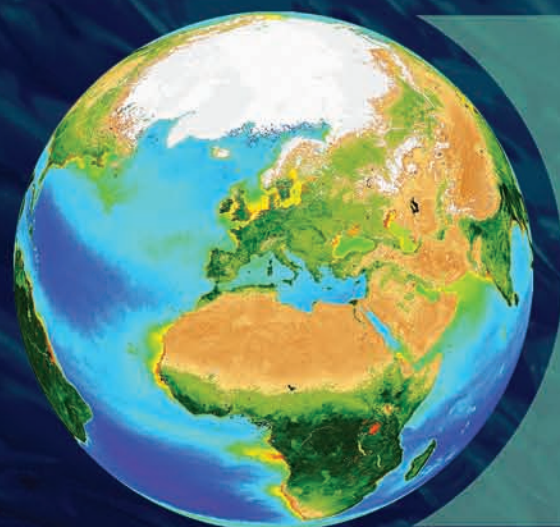
Since December 2008, INCOIS has provided MODIS-Aqua data in near real-time mode to all participating countries through an ftp-based server.



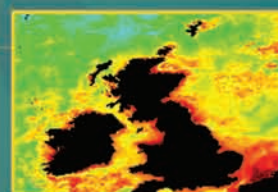
Chlorophyll concentration (top right) and sea-surface temperature (bottom right) in the Northeastern Indian Ocean, MODIS April 2010



Europe



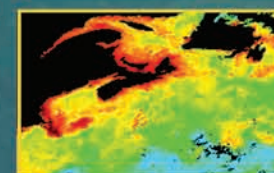
Chlorophyll concentration (top right) and sea-surface temperature (bottom right) around the UK, MODIS April 2010



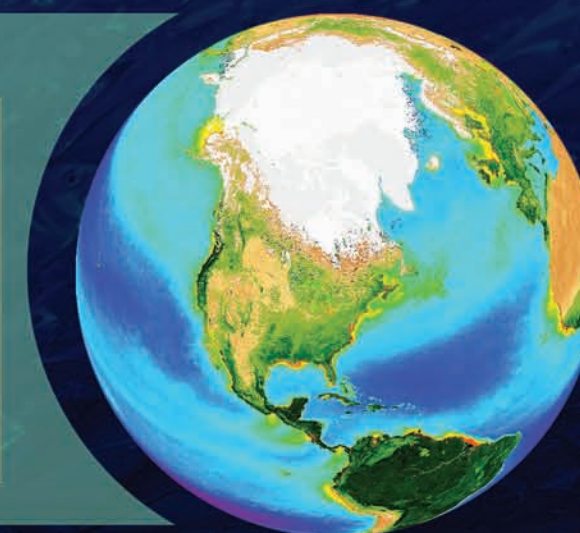
- ChloroGIN Europe brings together various existing and new services for operational chlorophyll-based products across Europe. The Plymouth Marine Laboratory, UK and Joint Research Centre, Italy are major participants in ChloroGIN Europe.
- Joint Research Centre: processes ocean-colour radiometry data at full resolution on pan-European scale (including other regions of European interest); validates products, with emphasis on developing regionally-tailored approaches.
- Plymouth Marine Laboratory: operates a satellite data processing facility (NEODAAS) for UK academic scientists (includes near-real time transmission of data to research cruises to help *in situ* sampling); maintains ChloroGIN portal and provides data to other regions (such as Africa and Asia).

Canada

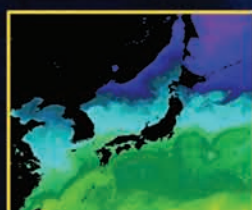
- The Northwest Atlantic Ocean time series was initiated after the launch of SeaWiFS (in 1997) as a contribution to the development of strategies for ecosystem-based management of marine resources.
- It served as an important tool for teaching and capacity building, leading to the development of Antares and subsequently ChloroGIN.
- It was the first of its kind, designed to follow the time course of pelagic ecosystem indicators for a particular region.
- It provided the basis for scientific papers relating ecosystem phenology with inter-annual variability in the survival of larval fish, and with basin-scale variations in the life cycle of a commercially-important invertebrate (shrimp).



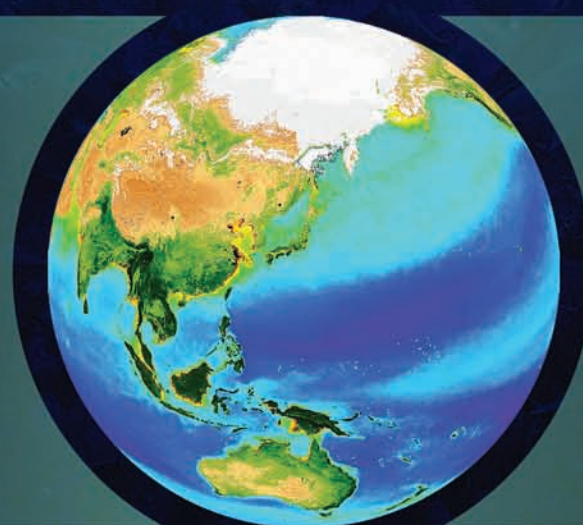
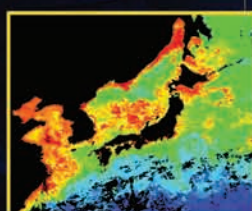
Chlorophyll concentration (top left) and sea-surface temperature (bottom left) south of Nova Scotia, Canada, MODIS April 2010



East Asia



Sea-surface temperature (top left) and chlorophyll concentration (bottom left) around Japan, MODIS April 2010



- The Northwest Pacific Region Environmental Cooperation Center supports ChloroGIN Northeast Asia through providing satellite data and related information on the Marine Environmental Watch Project website. This project is supported by the Ministry of the Environment of Japan as part of the Northwest Pacific Action Plan of United Nations Environmental Program.
- The Northwest Pacific Region Special Monitoring and Coastal Environmental Assessment Regional Activity Centre has also been conducting training courses on utilisation of satellite data for marine environment conservation (<http://www.nowpap3.go.jp/jsw/eng/index.html>).

Credit for Global Biosphere: SeaWiFS Project NASA/GSFC and GeoEye,
Credit for sea-surface temperature and chlorophyll satellite images: NASA

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An ecosystem task of the Group on Earth Observations (GEO)
A pilot project of the Global Ocean Observing System (GOOS)
An element of the Ocean Colour Radiometry Virtual Constellation (OCR-VC), initiative of IOCCG
A Partnership for Observations of the Global Oceans (POGO) Programme



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