



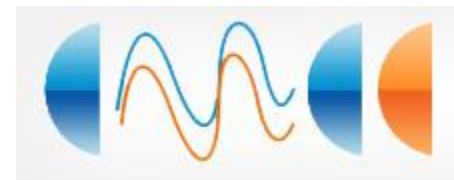
EGIDA Project

National Use Cases Workshop

Rome, Italy – April, 18-19, 2011



Italy contribution to the GEO Carbon Tasks



Antonio Bombelli



UNIVERSITÀ
DEGLI STUDI DELLA
Tuscia



Consiglio Nazionale delle Ricerche



Centro Euro-Mediterraneo
per i Cambiamenti Climatici



With the Support of the
Italian Ministry for Environment, Land and Sea

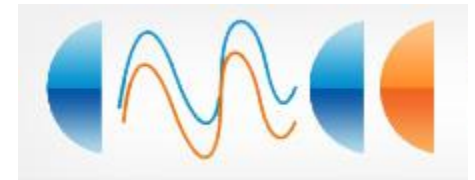


MINISTERO DELL'AMBIENTE
E DELLA TUTELA DEL TERRITORIO E DEL MARE

National Use Cases Workshop - Rome, April 18-19, 2011



Italy contribution to the GEO Carbon Tasks



The Background

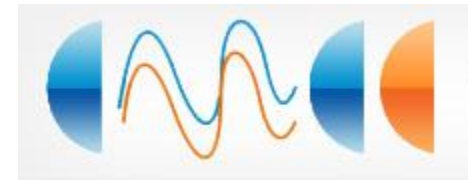
GEO Strategic Target 2015 – Climate

- Achieve effective and sustained operation of the global climate observing system and reliable delivery of climate information of a quality needed for predicting, mitigating and adapting to climate variability and change, including for better understanding of the global carbon cycle.
- This will be demonstrated by the development and facilitation of a comprehensive (atmosphere, ocean, land) global carbon observation and analysis system in support of monitoring based decision-making and related environmental treaty obligations.





Italy contribution to the GEO Carbon Tasks



The Background

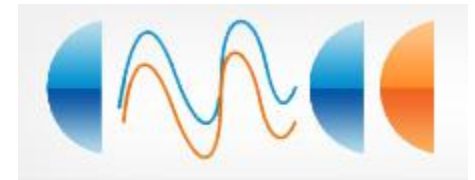
GEO Task CL-09-03: Global Carbon Observation and Analysis System

- Implement a global carbon observation and analysis system addressing the three components of the carbon cycle (atmosphere, land and ocean) and providing high-quality regional information on CO₂ and CH₄ concentrations and emission variations. Combine observations, reanalysis and product development to develop tools for carbon tracking and carbon storage change evaluation. Improve carbon monitoring from space.





Italy contribution to the GEO Carbon Tasks



The Background

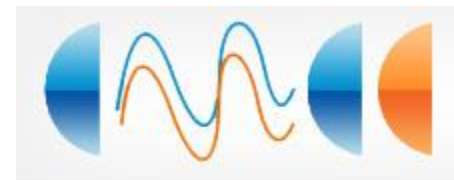
CL-09-03a) Integrated Global Carbon Observation (IGCO)

- Leaders: Italy (University of Tuscia), France (LSCE), Netherlands (University of Amsterdam), USA (NOAA, USDA/Forest Service, USGS), Japan (JAXA), GTOS and WMO (GAW), and supported by the CCoP.
- Support the development of an integrated global carbon observation system, including improved global observation networks of CO₂, CH₄, isotope ratios, air-surface exchange flux, surface ocean CO₂ and related marine biochemistry. Encourage the development of high-resolution global and regional data-assimilation and modelling systems to enhance the utility of the spatial and temporal resolution of those observations and provide relevant regional-scale info.





Italy contribution to the GEO Carbon Tasks



The next GEO 2012-15 Work Plan: new Proposed Carbon Task

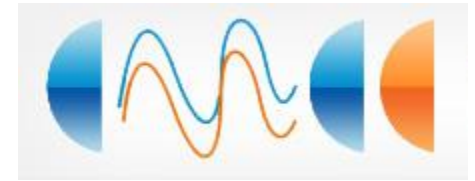
DS-12 Global Carbon Observation and Analysis

- Develop a comprehensive (atmosphere, ocean, land) global carbon observation and analysis system in support of monitoring based decision-making and related environmental treaty obligations (Climate Strategic Target). Increase the operational monitoring of major ecosystems on land on an annual basis, including properties such as carbon estimates of vegetation and soils based on remote sensing and sampled in-situ observations using internationally agreed standards (Ecosystems Strategic Target).
- Deliverable: an integrated global carbon observation and analysis system (e.g. establish carbon budgets at different scales; improve global observation networks of CO₂, CH₄, isotope ratios and exchange fluxes; develop geo-information tools, databases and models integrating carbon reservoir and flux data; foster the use of space-based greenhouse gas observations and consolidate data requirements for the next-generation GHG monitoring missions)





Italy contribution to the GEO Carbon Tasks



Past: CarboAfrica (EC – FP6)

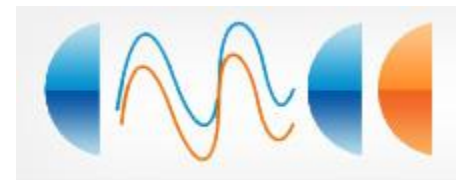
Quantification understanding and prediction of C-cycle and other GHGs in Sub-Saharan Africa

- Coordinator: Italy (University of Tuscia)
- Partnership of 15 Institutions: MPI-BGC (Germany), ULUND (Sweden), FAO/GTOS, CIRAD (France), NERC (UK), CNR-IBIMET (Italy), IAO (Italy), DSA-SUN (Italy), CSIR (S.Africa), UR2PI (Congo), ARC (Sudan), CEA (France), KCL (UK), ULEICS (UK)
- Duration: 3.5 years (01/10/06 – 31/03/2010)
- Funds: 2.8 M€





Italy contribution to the GEO Carbon Tasks



Past: CarboAfrica (EC – FP6)

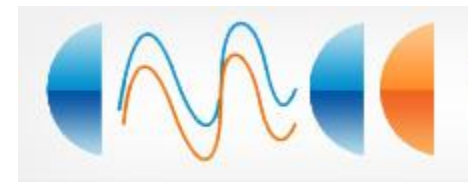
CarboAfrica was an official contributor to the **GEO task CL-09-03**, by supporting the following CL-09-03 (previous) objectives:

- *implement of a global carbon observation and analysis system, improving the global networks of terrestrial and atmospheric observations (in an underrepresented region such as Africa)*
- *provide high-quality regional information on CO₂ concentrations and emission variations*
- *support the development of an integrated global carbon observation (IGCO) system*
- *develop regional data-assimilation and modelling systems*





Italy contribution to the GEO Carbon Tasks



CarboAfrica the Network

19 stations
(CarboAfrica + AMMA
+ 3 associate sites)

1 Atmospheric CO₂ station

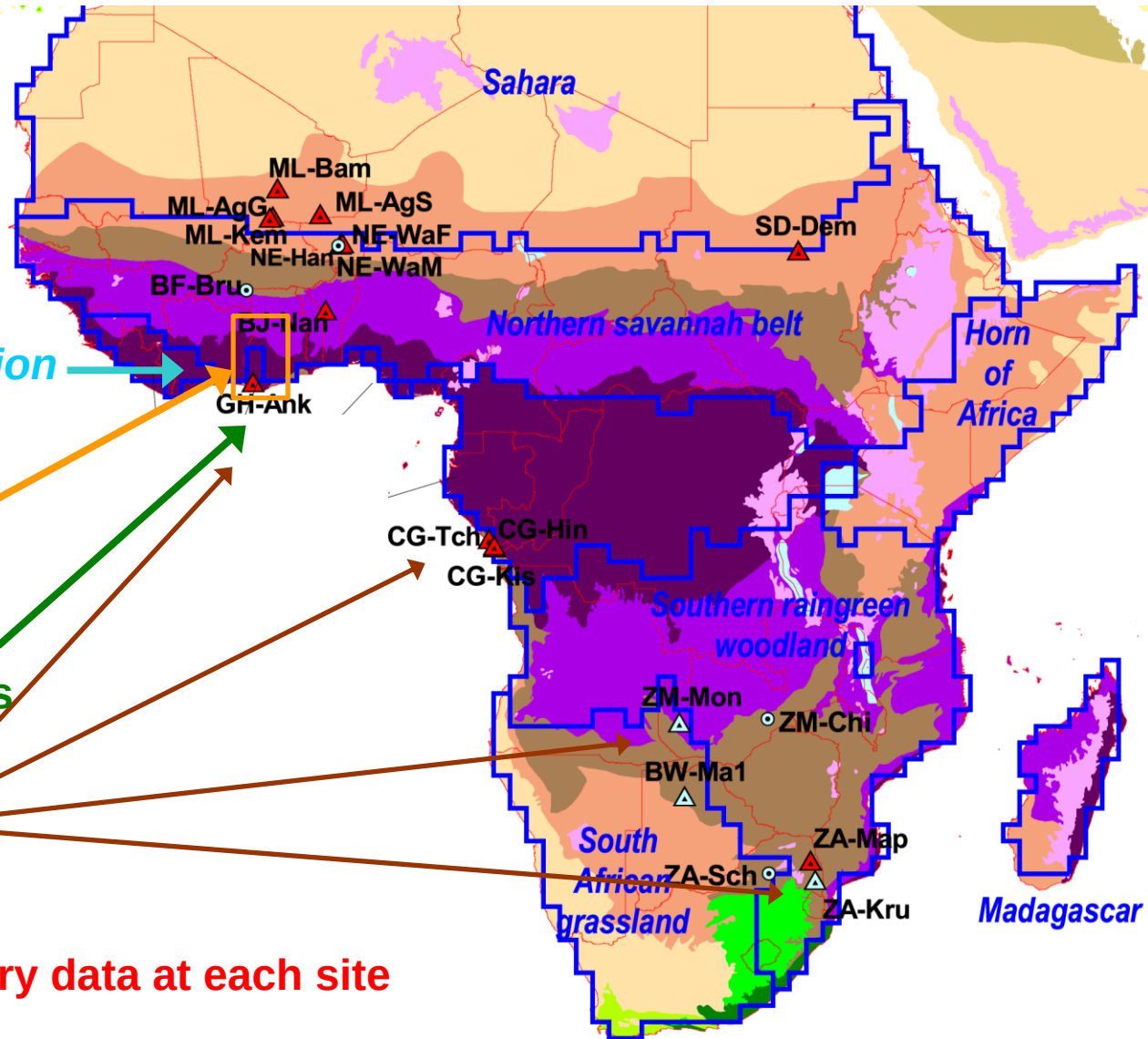
CARE Experiment

Biodiversity, biomass
and soil field campaigns

Soil Campaigns

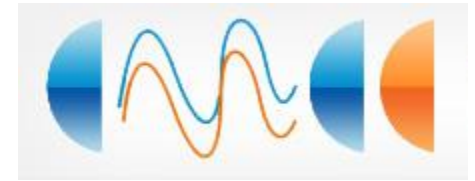


+ ancillary data at each site





Italy contribution to the GEO Carbon Tasks



Past: CarboAfrica (EC – FP6)

Some Results

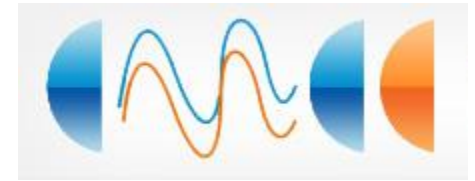
- Carbon and GHGs terrestrial monitoring network of Sub-Saharan Africa (SSA) expanded and coordinated
- SSA C-cycle: dominated by biogenic processes
- C-fluxes: highly correlated to water availability / rainfall patterns
- Emissions: mainly due to fires (particularly savannas), deforestation and forest degradation
- Fires consume more than 10% of Savanna NPP annually
- Fossil fuel emissions: still relatively low (<4% of global values)
- Total C-budget: still highly uncertain! (could be near C-neutral, but high inter-annual variability)



Africa could have a potential for C-sequestration higher than expected



Italy contribution to the GEO Carbon Tasks



Now: COCOS (EC – FP6)

COCOS – Coordination action on Carbon Observations

Coordinator: VUA (Netherland)

Partnership : 11 Institutions, including **UNITUS (Italy)**

Duration: 01/05/2008 – 31/10/2011

Main objective

- Contribute to GEO by linking the relevant international carbon community in order to improve the harmonization, interoperability and assessment of global carbon cycle monitoring.

Main roles of UNITUS

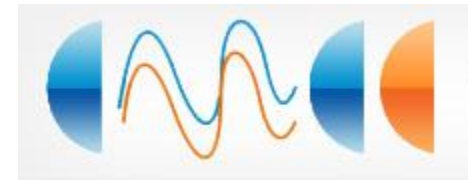
- Regional Carbon budgets estimates

Organization of the final conference





Italy contribution to the GEO Carbon Tasks



Now: COCOS (EC – FP6)

COCOS Final Conference: Carbon in a changing world

24-26 October 2011, FAO, Rome.

- Participants: COCOS partners, GEO community, EC and any other relevant institutions

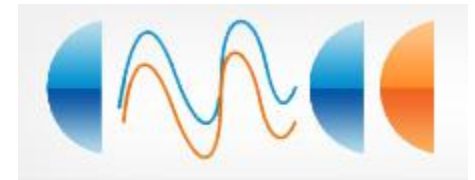
Aims:

- To present the latest scientific developments in understanding the global carbon cycle
- To present an overview of the building and implementation of a Global Carbon Observing System for land, oceans and atmosphere
- To identify progress and gaps in obtaining politically meaningful estimates of regional carbon budgets on land and ocean





Italy contribution to the GEO Carbon Tasks



Future: GEOCARBON (EC – FP7)

Operational Global Carbon Observing System

Last FP7 Call: ENV.2011.4.1.1-1 Integration and optimisation of information for building a Global Carbon Observing System

Funding: 6.5M€

Duration: 3 years

Start: September 2011?

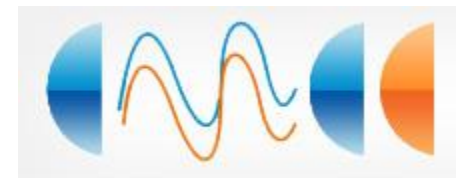
Main objective

- Support the implementation of the GEO Task CL-09-03 by coordinating the development of an operational Global Integrated Carbon Observation and Analysis System, building on the experience of previous and current related projects funded by the EC and national and international programmes.





Italy contribution to the GEO Carbon Tasks



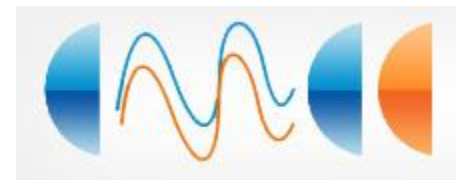
GEOCARBON - Consortium

	Participant Organization name	Acronym	Country
1	Centro Euro-Mediterraneo per i Cambiamenti Climatici	CMCC	Italy
2	University of East Anglia	UEA	UK
3	Eidgenössische Technische Hochschule Zürich	ETH Zurich	Switzerland
4	Wageningen Universiteit	WU	Netherlands
5	University of Oxford	UOXF.AC	UK
6	Vereniging voor Christelijk Hoger Onderwijs Wetenschappelijk Onderzoek en Patiëntenzorg	VUA	Netherlands
7	University of Leeds	UNIVLEEDS	UK
8	Max Planck Gesellschaft zur Förderung der Wissenschaften e.V.	MPG	Germany
9	Université de Versailles Saint-Quentin-en-Yvelines	LSCE-UVSQ	France
10	SRON Netherlands Institute for Space Research	SRON	Netherlands
11	Seconda Università di Napoli	SUN	Italy
12	University of Edinburgh	UEDIN	UK
13	Stiftelsen Nansen Senter for Fjernmaaling	NERSC	Norway
14	Università degli Studi della Tuscia	UNITUS	Italy
15	Universitetet i Bergen Organisasjonsedd	UiB	Norway
16	Gamma Remote Sensing Research and Consulting AG	GAMMA	Switzerland
17	Wildlife Conservation Society/Cameroon Biodiversity Program	WCS	Cameroon
18	FASTOPT GMBH	FASTOPT	Germany
19	University of Bristol	UNIVBRIS	UK
20	Internationales Institut Fuer Angewandte Systemalyse	IIASA	Austria
21	Instituto de Pesquisas Energeticas e Nucleares	IPEN	Brazil
22	Food and Agriculture Organisation of the United Nations Fao	FAO	International
23	Université Libre de Bruxelles	ULB	Belgium
24	Laboratoire de Météorologie Dynamique/Centre National de la Recherche Scientifique	LMD/CNRS	France
25	Universität Hansestadt Hamburg	UHAM	Germany





Italy contribution to the GEO Carbon Tasks



Future: GEOCARBON (EC – FP7)

Specific objectives

- Provide an aggregated set of harmonized global carbon data information (integrating the land, ocean, atmosphere and human dimension)
- Develop improved Carbon Cycle Data Assimilation Systems (CCDAS)
- Define the specifications for an operational Global Carbon Observing System
- Provide improved regional carbon budgets of Tropical South America and Africa
- Provide comprehensive and synthetic information on the annual sources and sinks of CO₂ for the globe and for large ocean and land regions
- Improve the assessment of global CH₄ sources and sinks and develop the CH₄ observing system component
- Provide an economic assessment of the value of an enhanced Global Carbon Observing System
- Strengthen the effectiveness of the European and global carbon community participation in the GEO system.



EGIDA Project

— **THANK YOU!**



Jožef Stefan Institute, Ljubljana, Slovenia



BLB

