



GEO and Water

- GEOSS Workshop on Decision-Making Support For Coastal Zone Management, Water Resources & Climate Change In Africa
- **16 February 2010, Cotonou**
- Douglas Cripe, GEO Secretariat





- "Governance" has been mentioned 8 times during the sessions. The issue of governance is critical – but scientists leave it to politicians and politicians think scientists are tedious. There is a gap between science and governance.
- Until such time as there is a mechanism for interplay between science, policy, and governance, we are very far away from the reality we propose. There must come a time when we focus on good governance, transparency, commitment.
- Biggest challenge: no coordination platform/mechanism/structure for governance of Large Marine Ecosystems (LMEs) of West Indian Ocean.





Global Earth Observation System of Systems (GEOSS) objectives:

- Improve and Coordinate Observation Systems (avoid duplications)
- Provide Easier & More Open Data Access
- Foster Use (Science, Applications)
- Building Capacity
- Identify gaps in observations (based on user requirements)

...Earth Observation Systems should be coordinated and shared internationally

... to answer Society's need for informed decision making





GEOSS: A Global, Coordinated, Comprehensive and Sustained System of Observing Systems







Changes in precipitation...



Source: IPCC 4th AR





Impacts on water resources...



Source: IPCC 4th AR

Annual Fresh Water Withdrawals

The width of the light blue line represents 100% of the natural fresh water resource available to each country

Source: UN Human Development Report 2000

Water

Before 2015, GEO aims to:

13. Produce comprehensive sets of data and information products to support decision-making for efficient management of the world's water resources, based on coordinated, sustained observations of the water cycle on multiple scales.

Monitoring and managing water resources: A cross-cutting issue

GEO Water Tasks

• Droughts, Floods and Water Resource Management

 Address decision-making challenges related to the management of hydro-meteorological extremes and the sustainable use of water.

• Capacity Building for Water Resource Management

- Initiate capacity building programs in support of water management, to show the value of, and develop tools for, Earth observation data.
- Integrated Products for Water Resource Management and Research
 - Improvements and expansion of in-situ networks, combined with new satellite missions and emerging assimilation and prediction capabilities for integrated tools in global water-cycle management.

The GTN-H is a joint project of the Global Climate Observing System (GCOS), the World Meteorological Organization / Climate and Water Department (WMO/CLW), and the Global

The GTN-H website is a gateway to a great number of global observing systems for hydrological data. You can find descriptions and links to all network partners of GTN-H and the hydrological

Additional material is continuously uploaded to this page and a few pages are still under

Terrestrial Observing System (GTOS).

construction.

data products developed under the cooperation the network.

The global water cycle (US Global Change Research Program, 2003)

Contact

Network Partners

Global Terrestrial

Hvdrological Data

Networks

Coordination

GTN-H and GEO/GEOSS

Publications 2009 Meeting

Access

WMO ICSU IOC UNEP

Copyright © 2008, Water Systems Analysis Group Contact the <u>webmaster</u>

Done							
🏄 Start 🧶 🞯 📢 Global Terrestri	🐑 Novell GroupWise	🔁 Mail From: Anthon	🔁 Mail From: Nicolas	presentations	🚞 GEO	🛛 💽 4 Microsoft Offic 🚽 📑 enviroGRIDS_	kicko 🤜 11:47 AM

Global Precipitation Analysis

Laboratory for Atmospheres NASA Goddard Space Flight Center

- . Global Real-Time 3-Hourly Precipitation Analysis of TRMM DATA
- Global Monthly Merged Precipitation Analyses of GPCP (<u>1979-present</u>)
- Global Daily Merged Precipitation Analyses of the GPCP (1997-present)
- Monthly and Pentad SSM/I-based Precipitation Analyses using GPROF6
- . ENSO Precipitation Analyses (Research and Monitoring)

Done

• Precipitation patterns in the tropical Pacific over the last 12 months

The precipitation research groups in the Mesoscale Atmospheric Processes Branch (Code 613.1) have constructed a number of data sets containing estimates of precipitation which are available at this site. Some estimates are sufficiently well developed that other researchers can find the data and associated products useful. Potential users are urged to pay careful attention to the differences among the data sets and to check back for updates to the data sets. Questions should be directed to the data set originators. All local binary data sets are held in Silicon Graphics (big endian) format.

Monthly Data	Pentad Data	Daily Data	3-Hourly Data	Climatology
Summary		Summary		Summary
Data	Data	Data		Data
Images		Images		Images

Global Precipitation Climatology Project (GPCP)

Goddard Profiling Algorithm (Derived from SSMI)

🍂 Start	🙂 🔂 📵	GPCP - Mozill	🐑 Novell GroupWi	🔁 Mail From: Ant	🔁 Mail From: "Ke	presentations	🕙 enviroGRIDS_I	🕙 GEO.water.see	🕙 AP.water.ppt	🕙 GEO-ITC.24.09	« 음 💽 1:16 PM

GRACE - Gravity Recovery and Climate Experiment - Mozilla Firefox								
<u>File E</u> dit <u>V</u> iew Hi <u>s</u> tor	ry <u>B</u> ookmarks <u>T</u> ools <u>H</u> elj	p					1	
C > C >	< 🏠 💽 http://www.	.csr.utexas.edu/grace/				☆ · GRACE	ý	
🔊 BBC 🔊 NYT 🔊 SFC	e 🔊 lat 🔊 dp 🍤 🚸	🏟 🖂 М 😲 🖽	🚾 🖸 [ch] C 🛐	🛛 👯 📃 📄 wmo 🥮 wm	o-portal 🧭 🚟 🗋	📄 GTN-R 💥 🔗 📋 GTrans 📄 WRS 📄 Wageningen 🅀 SDO		
🛛 🥅 Gmail - Inbox - dcripe@	@gmail.com 🛛 🖂 🕅	1ail :: Inbox (9)	🛛 📄 CZCP_At	hens_report_FINAL.pdf (appli	🔤 💽 GRACE - Grav	/ity Recovery and Cli 🔯		
Contraction of the second				and the second				
CP	ACE	GER GEZ	-A-		12 - 20			
GK/	ACE	CAS R	DLR	1				
Gravity Reco	overy and Clim	ate Exneriment						
	over y and chin	are Experiment		and the second	1			
HOME	SCIENCE	OPERATIONS	MISSION	FLIGHT SYSTEMS	CSR			
GAMES	EDUCATION	PUBLICATIONS	GALLERY	SEARCH	search			
The GGM02 Models	GRACE, twin sate detailed measureme	llites launched in Ma ents of Earth's gravity	arch 2002, are m / field which will le:	aking ad to				
Science Data Products	discoveries about discoveries could h world's population.	gravity and Earth's nave far-reaching ben	natural systems. T lefits to society and	These d the				
<u>Level-3 Data</u> <u>Products</u>					Grace1			
<u>GRACE</u> <u>Science</u> <u>Team Meeting</u>				The second	A			
	a faith the							
Mission	No.		10	6.3ux20011125.54.00	CSR			
Overview	Real YAR			<u>Current</u>	Orbit Data			
<u>GRACE</u>	Urt	oiting Twins - The GRACE :	satellites	Mission E	lapsed Time			
Launch				Days	Hours			
<u>GRACE</u> <u>Newsletter</u>				888	8 8 8			
GRACE	GRACE in the New	ws						
Partners	Antarctic Ice Loss	s Speeds Up, Nearl∨	Matches Greenlan	nd Loss				
					in the flux of the			
PU.DAAC	alaciers and is n	a increased by 75 per low nearly as great	cent in the last 10 ye as that observed	ears due to a speed-up in Greenland, accor) in the flow of its ding to a new			
ISDC	comprehensive stu	dy by NASA and unive	rsity scientists.		J			
http://www.csr.utexas.edu	u/grace/							

🍂 Start	🕘 🕑	🕑 GRACE - Grav	🐑 Novell GroupWi	🔁 Mail From: Ant	🔁 Mail From: "Ke	🔁 Mail From: "pau	🔁 Mail From: Sue	🔁 Mail From: <lo< th=""><th>🚞 2 Windows E 👻</th><th>đ</th></lo<>	🚞 2 Windows E 👻	đ
---------	-----	----------------	------------------	------------------	------------------	-------------------	------------------	--	-----------------	---

🛐 4 Microsoft O... 🚽 🛛 < 🎒 3:33 PM

Interannual change in land water storage estimated from GRACE (2002-2006)

Blue : water loss

Total budget : net land water loss sea level rise : ~ 0.2 mm/year

ubiquitous groundwater-related problems are very demanding tasks. Sharing groundwater information and experience on

a world-wide scale would be of great help in this respect. This is

presentations

February 16, 2009

» Benchmark papers on groundwater

more news »

Global Groundwater Information System-GGIS

GGIS is an interactive portal to groundwaterrelated information and knowledge.

world-wide scale and on a non-commercial basis.

read more »

what IGRAC supports and promotes.

IGRAC is dedicated to groundwater information and knowledge in the widest sense, on a

Transboundary Aquifers of the World

👰 enviroGRIDS_I... 🔯 GEO.water.see... 🔯 AP.water.ppt

At WWF5 in Istanbul, IGRAC presented its latest product: Transboundary Aquifers Map of the World. His Royal Highness Prince Willem-Alexander,...

read more »

All rights reserved @ IGRAC

📵 International... 🐚 Novell GroupWi... 🛱 Mail From: Ant... 🛱 Mail From: "Ke...

Privacy Policy | Disclaimer

🏙 GEO-ITC.24.09... 🛛 < 🦳 💽 1:05 PM

Done

3

Welcome to the pages of the Microwave Remote Sensing Group

of the Institute of Photogrammetry and Remote Sensing, Vienna University of Technology, Austria

Home

ERS/MetOp Soil Moisture

ScanSAR Surface Hydrology

QuikSCAT Freeze-Thaw

Data Distribution

Image Gallery

Our Team

Diploma Theses

Vacancies

Contact / Imprint

Global Monitoring of the Hydrosphere with Radar Satellites

Radar instruments onboard satellites can see through clouds and can be operated day and night. They can monitor changes in water content in soil, vegetation and snow, detect when the Earth surface is frozen, and map inundation patterns. Therefore, radar satellites are ideally suited for monitoring hydrological processes over land.

The goal of our research is to develop practical methods for the retrieval of hydrologic parameters from radar satellites.

We use the scatterometers onboard the ERS and the upcoming MetOp satellites for **global monitoring of soil moisture**, the Advanced SAR (ASAR) instrument onboard the ENVISAT satellite for **mapping wetlands**, and the SeaWinds scatterometer onboard QuikSCAT for **freeze-thaw monitoring in high-latitude regions**. It is important for us that the products we derived are used by the scientific community.

AP.water.ppt

lesign by www.bartalis.com and wemu - optimised for Mozilla Firefox 1.5 and 1280 x 1024

http://www.ipf.tuwien.ac.at/radar/index.php?go=ascat

者 Start

🕲 🞯 Microwave Rem... 🐚 4 Novell GroupWi... 🗸 🗀 presentations 🛛 🔂 GEO

🐏 enviroGRIDS_Intro... 🔯 GEO.water.seeem...

🔰 🐏 GEO-ITC.24.09.08... 🛛 < 🤗 12:22 PM

-4

4

_ 8 ×

© CLS/LEGOS/CNES

🕲 MSL_Map_MERGED_Global_IB_RWT_NoGIA_Adjust.png (PNG Image, 1517x958 pixels) - Scaled (83%) - Mozilla Firefox

Done							
🏄 Start 🥮 🚱	🕑 Mean Sea Level: Avis	MSL_Map_MERGED	🐑 6 Novell GroupWise 👻	presentations	C newHARON	🗀 5th_mtg	💽 5 Microsoft Office Po 🗸 < 🖳 쓁 3:54 PM

ARGO Buoys

3388 Floats deployed by 23 Nations.

😊 ChloroGIN Earth - Mozilla Firefox	
Eile Edit View History Bookmarks Tools Help	
🔇 🔊 🕑 🗶 🏠 📄 http://www.chlorogin.org/world/index.php?map.x=4328map.y=103	🟠 🔹 chlorogin 🖉
🔝 BBC 🔊 NYT 🔊 SFC 🔊 LAT 🔊 DP 🎱 🦑 🗐 🖂 📉 😲 🏧 🚾 🖬 [ch] 🖉 🛐 🕷 🧮 📄 wmo-portal 🛞 🧱 🗋 🚞 GTN-R 🤅	🌞 🗇 📋 GTrans 🗋 WRS 🗋 Wageningen 🍈 SDO 👘 »
M Gmail - Inbox - dcripe@gmail.com 🛛 🖂 Mail :: Inbox (9) 🖄 🚺 ChloroGIN Earth 🛛 🔯 🗋 A20090012009031.L3m_MO_r	CHL0_9 🖾 🔹
ChloroGIN Earth	
Earth Africa South America Contact Partners	chloroGIN

The Chlorophyll Global Integrated Network (ChloroGIN) project aims to promote in situ measurement of chlorophyll in combination with satellite derived estimates. The project was initiated following recommendations of the <u>"Plymouth Chlorophyll Meeting and Workshops (Extended Antares Network)</u>" sponsored by GOOS, GEO, IOCCG, PML and POGO 18 - 22 Sept 2006 and was inspired by the <u>Antares network</u> that provides satellite coverage over Latin America. The ChloroGIN portal is maintained by Plymouth Marine Laboratory.

Done

🏄 Start

3

GEO Portal

- Provides web-based interface for searching and accessing the data, information, imagery, services and applications available through GEOSS.
- Connects users to data bases, services and portals that provide reliable, up-to-date, integrated and user-friendly information – vital for the work of decision-makers, managers and other users of Earth observations.

Common Infrastructure

are organizing a major symposium on forest monitoring in Foz do Iguaçu, Brazil from 4 to 7

The second annual Symposium for the American region will take

ferring data from www.geoportal.org...

...we will accelerate efforts within the Global Earth Observation System of Systems (GEOSS), ... in priority areas, inter alia, climate change and *water resources management,* by strengthening observation, prediction and data sharing. ... capacity building for developing countries ... interoperability and linkage ...

GEO has the ears of Ministers...

- GEO designed to serve as interface between scientists, end-users, policitians, and decisionmakers
- GEO Principals at Ministerial level
- Also Through:
 - Communities of Practice
 - Involvement in GEO Committees
 - Plenary / Ministerial Summit meetings
 - Initiatives (regional to global)

Integrated Global Water Cycle Observation (IGWCO) Community of Practice

- supports the water sector by identifying the need and facilitating the development of appropriate observations and the use of data products derived from these observations;
- 2. identifies and promotes practices that maximize the benefits of Earth Observations for economic and environmental enhancement, and the sustainable development of water resources;
- 3. develops assessments, success stories and statements about the benefits of water cycle observations;

IGWCO Community of Practice

- 4. provides a forum for the discussion of new approaches to water management needed to better utilize Earth Observations and products;
- 5. facilitates linkages between the water sector and other GEO societal benefit areas for the development and applications of GEO data products;
- 6. identifies the research needed to develop and exploit new observational capabilities and data products.

GEO Plenary

DECLARATION Towards a Service for the Water Cycle

Noticing that

one billion people are currently without sufficient access to clean drinking water;

according to the 2nd UN Water Assessment Report, this deficit is a result of governance problems and poorly informed decision making;

demand for water resources is rising due to increased water usage for potable consumption, energy production, irrigation for agriculture purposes, industrial and urban uses, while climate change is locally to regionally impacting water resources through increased frequencies and magnitudes of droughts and floods;

a better understanding of the water cycle on regional to global scales is critical for managing water resources in a sustainable manner;

and recognizing that

the GRACE satellite gravity mission has demonstrated the ability to measure mass redistribution in the water cycle, exemplified most recently by the detection of a decline in the water table in northwestern India between 2002 and 2008 of about 33 cm/yr due to groundwater withdrawals for irrigation; also exemplified by measurement of net decreases in the masses of ice stored in Greenland, certain regions of Antarctica, and Alaskan glaciers over the same time period;

the Participants of the Workshop on a Roadmap for Future Satellite Gravity Missions declare that

a long and uninterrupted series of satellite gravity missions with accuracies and resolutions at least as good as GRACE's is a crucial element of an observation system to adequately monitor the global water cycle and to improve our understanding of the processes and consequences of change;

such a series of satellite gravity missions would provide the basis for a global service to inform decision makers in a timely manner about ongoing and forecasted changes in the water cycle related to droughts, groundwater depletion, sea level changes, and other potential impacts of climate change.

Furthermore, the Participants of the Workshop have agreed on a roadmap towards future satellite gravity missions and, with this declaration, bring this roadmap to the attention of the GEO Plenary, the governments of the GEO Member Countries, and the Participating Organizations in GEO in an effort to initiate international action for the implementation of this roadmap, for the benefit of science and society in support of a sustainable and peaceful development. The participants declare their support for this action.

Towards a Roadmap for Future Satellite Gravity Missions September 30 - October 2, 2009, Graz, Austria

http://www.iag-ggos.org/workshops/Graz

GEO User Interface Committee (UIC)

Participatation solicited in : Global Earth Observation System of Systems (GEOSS) Survey

- Invitation
- Survey

African Water Cycle Coordination Initiative (AWCCI)

- Many countries are concerned about the potentially significant impacts of global climate change on critical, yet vulnerable water resources in Africa.
- The changing climate is affecting water resources and their use in ways that are only now being recognized. A better understanding of the effects of climate change on the water cycle is therefore needed.
- Increased frequency of climate extreme events in Africa is taking the form of heavy rains in some regions, and prolonged drought conditions in others.
- Many countries are becoming increasingly reliant on ground water resources. Over exploitation of this resource is responsible for lowering water tables in many countries. Furthermore, in many coastal areas groundwater is becoming saline from marine water intrusion.

AWCCI

- Observational systems, modeling capabilities and understanding of precipitation processes are needed to support operational forecast services, especially for the complex precipitation systems that produce rainfall over Africa.
- Although many water projects exist in Africa and many international agencies support water programmes there, the coordination of these activities is inadequate and leads to inefficiencies.
- Many African countries need to improve their limited capabilities and infrastructure for addressing these issues in a systematic way.

AWCCI

 Participants considered convergence and harmonization of observational activities, techniques, interoperability arrangements, and effective and comprehensive data management as the most fundamental elements that can be addressed under the GEOSS framework, including activities, programs and guidelines under UN agencies (WMO, UNESCO, FAO, UNEP and UNECA, etc.), and non-UN agencies (AfDB, ESA, JAXA, NASA etc.),

AWCCI

Task Team formed *making use of existing projects* to prepare:

- an assessment of water-related issues in Africa,
- an inventory of capabilities and activities in each country in terms of observations, modeling and information systems,
- an assessment of the data policies of governments and scientific communities;
- a draft implementation plan, including the definition of a set of preliminary actions.

"The Global Earth Observation System of Systems (GEOSS) is a coordinating and integrating network of Earth observing and information systems, contributed on a voluntary basis by Members and Participating Organizations of the intergovernmental Group on Earth Observations (GEO)."

•To support informed decision making for society, including the implementation of international environmental treaty obligations.

Thank you!

Web: earthobservations.org

Email: dcripe@geosec.org