EU FP 6 Project
GOCE 037063 with DG Environment

GEO-BENE

Global Earth Observation
-Benefit Estimation: Now, Next and Emerging

STREP
PRIORITY [1.1.6.3]
[Global Change and Ecosystems]

DELIVERABLE D9 (T26)
INTERIM BENEFIT AREA ASSESSMENT REPORT

Due date of deliverable: T26

Start date of project: 1 July 2006   Duration: 36 Months

Organization name of lead contractor for this deliverable:
International Institute for Applied Systems Analysis (IIASA)

Dissemination Level		
PU	Public	**X**
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

Contents

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Christian Schill, FELIS Uni Freiburg
Florian Kraxner, IIASA
Ian McCallum, IIASA

1 Purpose of Deliverable D9

The purpose of the GEOBENE Deliverable D9 (T26) "Interim Benefit Area Assessment Report" is to present and summarize the various work done on gathering information on benefit assessment within the 9 Societal Benefit Areas. The main contributing Workpackages have been WP5000 and precedent WPs.
In order to build up adequately documented data bases on benefit assessment, the interactive GEOBENE web page has been used. 2 different data-bases have been established online, aiming at different purposes.

In the following text, detailed description of access, data management and use of the project's benefit assessment databases is provided.

2 The Project's Benefit Assessment Databases

In the Geo-Bene project we have established two different databases to assess societal benefit of Earth Observation (EO): the **Public GEOSS** Benefit Assessment Database and the **GEOBENE** Benefit Assessment Database. In the Public GEOSS Benefit Assessment Database, results of a meta-study from a wide range of GEOSS-related benefit assessment studies (e.g. literature) are compiled for public users for scientific purposes. In the GEOBENE Benefit Assessment Database, a comprehensive benefit assessment on project-internal case studies is conducted and detailed information about case studies is collected for registered consortium members. Both databases are accessible at www.geo-bene.eu

2.1 <u>Public GEOSS</u> Benefit Assessment Database

The Public GEOSS Benefit Assessment Database - as a public domain database - provides a collection of EO-related benefit assessment studies available for interested researchers, stakeholders and policy makers. In the meta-study, we collected studies, which looked at measuring qualitative as well as quantitative information on the benefits of EO, illustrating the potential of EO in the different benefit areas, and using satellite observations or in-situ measurements. Every internet user involved in EO is invited to contribute to our database and can submit studies on the above GEOSS-related topics. All papers, reports and projects which currently exist are collected and published in this database after positive review.
We designed the web-site in a way that with a few clicks and some text you can provide literature and the most relevant information. A bibliographic module of our Content Management System (CMS) makes an advanced user-friendly interface possible. Every internet user can easily navigate the online submission, exploring the database, and searching and exporting relevant information. In addition, with this advanced management system, administrative users can effectively handle various background tasks such as generating confirmation E-mails automatically, forwarding entries to specific reviewers and managing the status (published or unpublished) of submitted studies by reviewers.

Every internet user can easily get access to the Public GEOSS Benefit Assessment Database (Public GEOSS) from the GEOBENE main page (www.geo-bene.eu). There are two ways to go to the database:
1. Click on the headline menu bar "Public GEOSS"; or
2. Click on the menu "Public GEOSS" in the navigation bar "GEOBENE" on the left side.

2.1.1 Contributing to Public GEOSS

By clicking on one of above two links for "Public GEOSS", every internet user receives the guideline page for the Public GEOSS Benefit Assessment Database (below). This page explains the aims and ways to contribute to Public GEOSS to the user. From this page, the user can also get access to the online submission page and database (below). Every internet user can contribute to the database in the following two ways:

1. go to the online submission page (only click on the link); and
2. send us reference files via E-mail

These methods are considered as the easiest submission process for users.

Geobene

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- ○ **Dissemination Material**
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- ○ **Archive**

Quotes

He who can no longer pause to wonder and stand rapt in awe, is as good as dead; his eyes are closed.
• Albert Einstein

Home

Submit Your Contribution to Public GEOSS

In the course of our **GEO-BENE** project we are carrying out a meta study on available **GEOSS**-related benefit assessment studies.
· We are looking for literature and any studies which look at measuring socio-economic benefits qualitatively or quantitatively in relation to earth observation.
· We welcome studies in the different social benefit areas which illustrate the potential of Earth Observation (EO).
· We are looking for studies using satellite observations, airborne or in-situ measurements. Studies which show the integration of satellite data and in-situ measurements are also welcome.
We designed the web-site in a way that with a few clicks and some text you can provide literature and the most relevant information.
We will publish the reference information of the meta-study after the evaluation by reviewers.
This state-of-the-art Meta Study on EO related benefit assessments will also be published on this web-site.

This web page will become a public domain database of all GEOSS related benefit studies and you are welcome to use it for your own scientific purposes.

To submit your contribution (preferably with Abstract and URL link),

You can either use our online submission page

OR

Send your reference files to us (RIS, EndNote, BibTex format): contribution.geoss@gmail.com

Go to Public GEOSS Benefit Assessment Database

When the user clicks on the link "online submission page", the following page appears. The header text of this page instructs users how to use our online form (below).

By following the instruction explained in the header area, a user selects one of the publication types from the drop-down list.

It generates an individual online form appropriate to each publication type for the study the user wants to submit. The requested fields for the database are highlighted automatically (below). Of course, a user can add more detailed information about the reference such as keywords, abstract, internet link (URL), which are not mandatory fields.

Home » Public GEOSS

Submit GEOSS Contribution Online

To begin your online submission, please select the Publication Type of the study from the drop-down list (Journal Article, Book etc). An individual input page appears automatically along with the publication type.

The entry fields with asterisk "*" are the mandatory fields for a contribution to the Public GEOSS Benefit Assessment Database.

To preview/submit your reference, you need to copy a CAPTCHA token shown below to prevent automated spam submissions.

After your successful submission, you will receive an automatically-generated confirmation E-mail. Your submission is also forwarded to our SBA (Social Benefit Area) specific reviewers. Only after your submission was accepted by reviewers, your contribution is published on our **Public GEOSS Benefit Assessment Database** .

For any further inquiries, please contact Steffen (**fritz@iiasa.ac.at**) or Florian (**kraxner@iiasa.ac.at**).

- Title field is required.
- Authors field is required.
- Year field is required.
- Name of Journal field is required.
- Your Contact E-mail field is required.
- Societal Benefit Area field is required.

Publication Type: *

Journal Article ▾

Title: *

Categories

Societal Benefit Area: *

– Please choose – ▾

Please select a societal benefit area of the study.

Assessment Type:

– None selected – ▾

Select an assessment type of the study (qualitative or quantitative)

Access to the document:

– None selected – ▾

Please identify the availability of publications (limited or open access)

Authors: *

Please separate by semicolons, e.g. Mozart, W.A.; Bach, S.; van Beethoven, L.

To submit or preview the entry, a user is requested to insert a CAPTCHA token (below). It is necessary to prevent access from unwanted users such as automated spam.

CAPTCHA

This question is for testing whether you are a human visitor and to prevent automated spam submissions.

6 G K
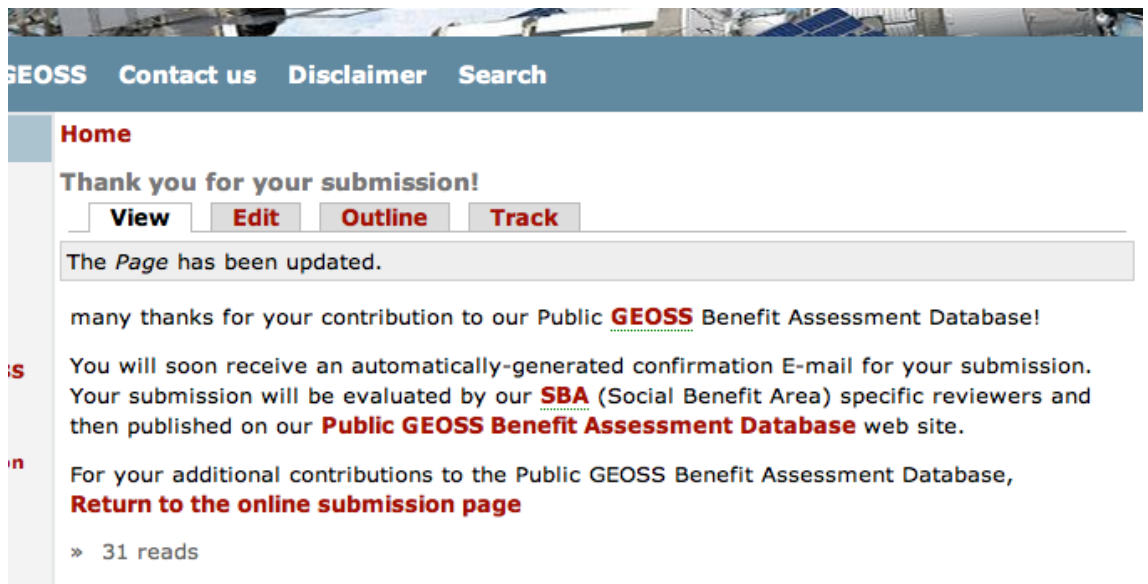
What code is in the image?: *

Copy the characters (respecting upper/lower case) from the image.

(Preview) (Submit)

Finally, a user receives a thank-you page that the entry has been submitted successfully (below). At the same time, a user receives an automatically-generated confirmation E-mail and the submitted entry is automatically forwarded to our SBA (Social Benefit Area) specific reviewers and evaluated. Note that only positively reviewed references are published on our web page.

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Thank you for your submission!

| **View** | Edit | Outline | Track |

The *Page* has been updated.

many thanks for your contribution to our Public **GEOSS** Benefit Assessment Database!

You will soon receive an automatically-generated confirmation E-mail for your submission. Your submission will be evaluated by our **SBA** (Social Benefit Area) specific reviewers and then published on our **Public GEOSS Benefit Assessment Database** web site.

For your additional contributions to the Public GEOSS Benefit Assessment Database, **Return to the online submission page**

» 31 reads

2.1.2 Retrieving Information

A user can easily find links to the main page of the Public GEOSS Benefit Assessment Database both from the menu "View Public GEOSS Benefit Assessment Database" on the left navigation bar and the link "Go to Public GEOSS Benefit Assessment Database" in the guideline page (below).

All positively reviewed references are stored in the database and every internet user can explore relevant information in the database through the user-friendly interface (see below or http://www.geo-bene.eu/?q=/biblio).

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Geobene

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  ○ **View Public GEOSS Benefit Assessment Database**
  ○ Online Submission
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  ○ Public Documents
  ○ Dissemination Material
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Quotes

An ambitious international project to unite the planet's Earth-observing systems is under way. But getting everyone on board is no easy task
• Naomi Lubick (Nature, 14 Jul. 2005)

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| **List** | **Filter** |

Found 42 results
Sort by:[**Year**][**Title**][**Type**][**Author**][**Keyword**]   Export:[**Tagged**][**XML**][**BibTex**]

2009

Assessing the value of information for water quality management in the North Sea, Bouma, J. A.; van der Woerd, H. J.; Kuik, O. J. , Journal of Environmental Management, Volume 90, Number 2, p.1280-1288, (2009) **Abstract**
Export: **Tagged XML BibTex**

Evaluating the socio-economic impact of Geographic Information: A classification of the literature, Elisabetta Genovese; Gilles Cotteret; Stéphane Roche; Claude Caron; Robert Feick , International Journal of Spatial Data Infrastructures Research, Volume 4, (2009) **Abstract**
Export: **Tagged XML BibTex**

Earth Observations in Social Science Research for Management of Natural Resources and the Environment: Identifying the Contribution of the U.S. Land Remote Sensing (Landsat) Program, Macauley, Molly K. , p.26, (2009) **Abstract**
Export: **Tagged XML BibTex**

THE VALUE OF EARTH OBSERVATION FOR MANAGING THE GREAT BARRIER REEF, Bouma, Jetske; Kuika, Onno; Dekker, Arnold , Number D80; Q25; , p.18, (2009) **Abstract**
Export: **Tagged XML BibTex**

2008

A Conceptual Framework for Assessing the Benefits of a Global Earth Observation System of Systems, Fritz, S. Scholes, R.J. Obersteiner, M. Bouma, J. Reyers, B. , Systems Journal, IEEE, Volume 2, Number 3, p.338-348, (2008) **Abstract**
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A real options approach to satellite mission planning, Fuss, Sabine; Szolgayova, Jana; Obersteiner, Michael , Space Policy, Volume 24, Number 4, p.199-207, (2008) **Abstract**
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An Efficient Grid Based Metadata Processing And Sharing Architecture For GEOSS, Hassan, M. M.; Eui-Nam, Huh , Advanced Communication Technology, 2008. ICACT 2008. 10th International Conference on 17-20 Feb. 2008, Volume 3, p.2071-2075, (2008) **Abstract**
Export: **Tagged XML BibTex**

Connecting Hazard Analysts and Risk Managers to Sensor Information, Le Cozannet, Gonéri; Hosford, Steven; Douglas, John; Serrano, Jean-Jacques; Coraboeuf, Damien; Comte, Jérémie , Sensors, Volume 8, Number 6, p.3932-3937, (2008) **Abstract**
Export: **Tagged XML BibTex**

On the top navigation area of the database interface (see below), one can sort all entries by various criteria (year, title type, etc.) and download (export) all entries with various formats (Tagged, XML and BibTex) – compatible to common reference software such as EndNote (www.endnote.com), Zotero (www.zotero.org) - for practical use of our bibliographic database.

Moreover, a user can search more detailed information by using the "Filter" function by clicking on the "Filter" tab in the database main page (below).
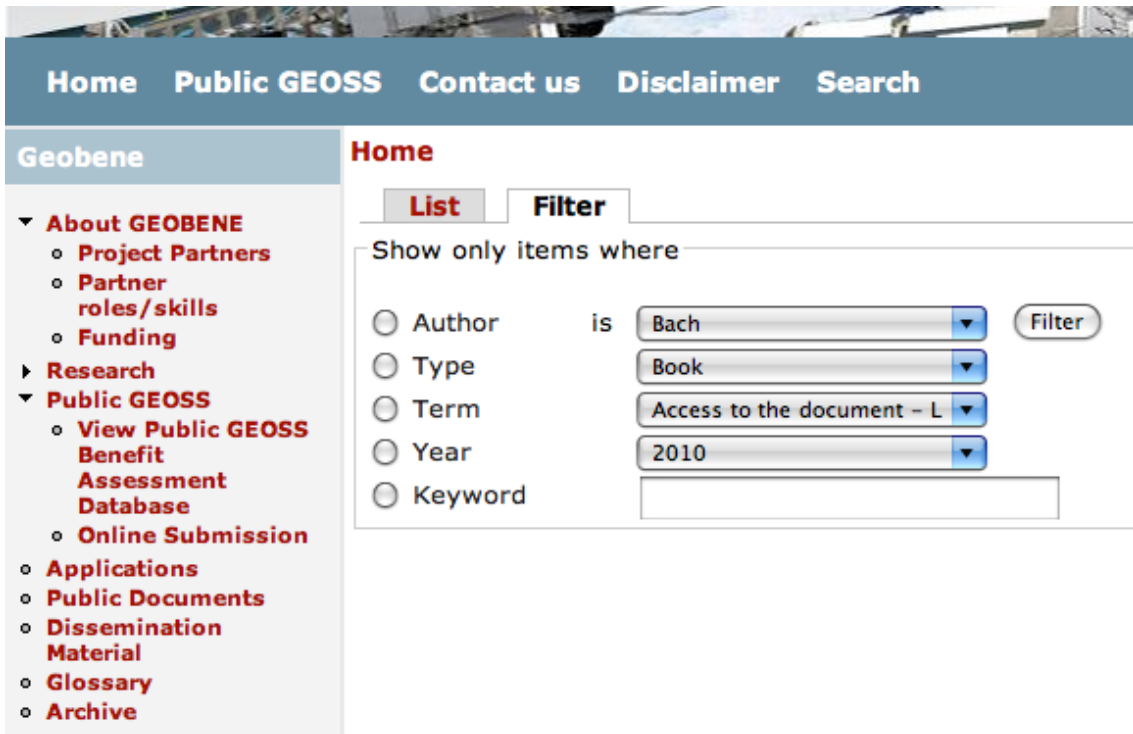
Then the filter page appears and a user can select specific items i.e. keywords to explore the relevant information of the benefit assessment (see below).

A user can see detailed information for each entry by clicking on the titles in the list shown in the database main page. For example, by clicking on the title "A multidisciplinary multi-scale framework for assessing vulnerabilities to global change" (below), an individual page for this entry shows up.

In each individual entry page, one can find the detailed description of the study. In addition, one can list references by clicking on the individual author name or keyword highlighted in red (see figure below). If there is a link to an internet address (URL), one can go to the original web page in the internet. All information described in the individual page is also downloadable in various formats (item "Export" for Tagged, XML and BiBTex formats).

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A multidisciplinary multi-scale framework for assessing vulnerabilities to global change
Submitted by iiasa on Thu, 2009-03-26 17:34.   **Climate   Quantitative assessment**
Unknown

Publication Type	**Journal Article**
Authors	**Metzger, Marc J.; Leemans, Rik; Schröter, Dagmar**
Year	2005
Name of Journal	International Journal of Applied Earth Observation and Geoinformation
Volume	7
Number	4
Pages	253-267
DOI	10.1016/j.jag.2005.06.011
Keywords	**Adaptive capacity; Climate change; Ecosystem services; Environmental stratification; Potential impact; Vulnerability assessment**
Abstract	Terrestrial ecosystems provide a number of vital services for people and society, such as food, fibre, water resources, carbon sequestration, and recreation. The future capability of ecosystems to provide these services is determined by changes in socio-economic factors, land use, atmospheric composition, and climate. Most impact assessments do not quantify the vulnerability of ecosystems and ecosystem services under such environmental change. They cannot answer important policy-relevant questions such as [`]Which are the main regions or sectors that are most vulnerable to global change? [`]How do the vulnerabilities of two regions compare? [`]Which scenario is the least harmful for a sector? This paper describes a new approach to vulnerability assessment developed by the Advanced Terrestrial Ecosystem Analysis and Modelling (ATEAM) project. Different ecosystem models, covering biodiversity, agriculture, forestry, hydrology, and carbon sequestration are fed with the same Intergovernmental Panel on Climate Change (IPCC) scenarios based on the Special Report on Emissions Scenarios (SRES). Each model gives insights into specific ecosystems, as in traditional impact assessments. Moreover, by integrating the results in a vulnerability assessment, the policy-relevant questions listed above can also be addressed. A statistically derived European environmental stratification forms a key element in the vulnerability assessment. By linking it to other quantitative environmental stratifications, comparisons can be made using data from different assessments and spatial scales.
URL	**http://www.sciencedirect.com/science/article/B6X2F-4H9YCF6-2/2/aaef0cdce9837856bf48be43fdba623c**
Export	**Tagged XML BibTex**

From the individual reference page, a user can list more detailed benefit assessment criteria (below): Social Benefit Area (e.g. "Climate"); Assessment Type (e.g. "Qualitative assessment") and Accessibility of Documents (e.g. "Limited access"). Below is an example listed by Social Benefit Area "climate".

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Climate

Towards a global climate observing system

Submitted by iiasa on Thu, 2009-03-26 17:34.   **Climate**   **Qualitative assessment**
Limited access

Publication Type	**Journal Article**
Authors	**Fellous, Jean-Louis**
Year	2008
Name of Journal	Interdisciplinary Science Reviews
Volume	33
Pages	83-94
DOI	10.1179/030801808X259952
URL	**http://www.ingentaconnect.com/content/maney/isr/2008/00000033/00000001/art0(**

A multidisciplinary multi-scale framework for assessing vulnerabilities to global change

Submitted by iiasa on Thu, 2009-03-26 17:34.   **Climate**   **Quantitative assessment**
Unknown

Publication Type	**Journal Article**
Authors	**Metzger, Marc J.; Leemans, Rik; Schröter, Dagmar**
Year	2005
Name of Journal	International Journal of Applied Earth Observation and Geoinformation
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DOI	10.1016/j.jag.2005.06.011
Keywords	**Adaptive capacity; Climate change; Ecosystem services; Environmental stratification; Potential impact; Vulnerability assessment**
URL	**http://www.sciencedirect.com/science/article/B6X2F-4H9YCF6-2/2/aaef0cdce9837856bf48be43fdba623c**

African Climate Report. A Report Commissioned by the UK Government to Review African Climate Science, Policy and Options for Action

Submitted by iiasa on Thu, 2009-03-26 17:34.   **Climate**   **Qualitative assessment**   **Open access**

Publication Type	**Report**
Authors	**Washington, Richard; Harrison, Mike; Conway, Declean**
Year	2004
Pages	45
Institution	**Department for Environment, Food and Rural Affairs and Department for International Development**
City	London
URL	**http://ictupdate.cta.int/en/Documents/PDF-African-Climate-Report-A-report-commissioned-by-the-UK-Government-to-review-African-climate-science,-policy-and-options-for-action**

2.1.3 Overview Statistics

The overview statistics of the Public GEOSS Benefit Assessment Database is shown below. The number of studies collected in the database is classified with qualitative and quantitative assessment. The studies are also classified with Social Benefit Area and indicated by assessment types (qualitative and quantitative).
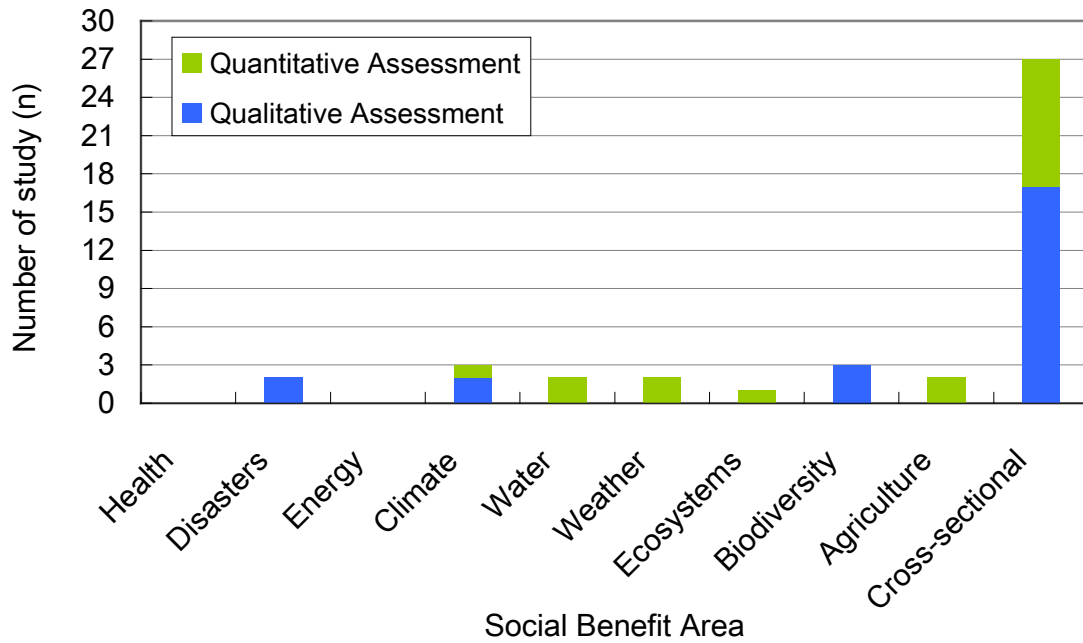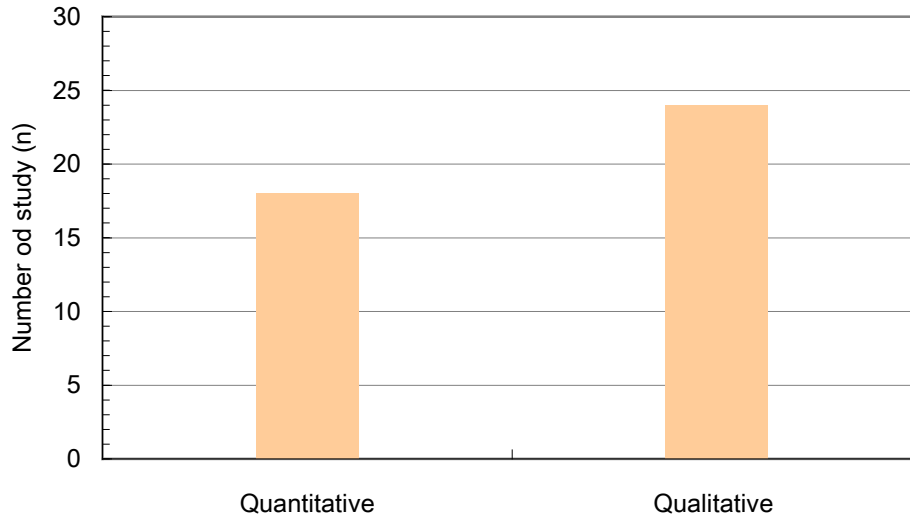
2.1.4 Current Contributions

The current list of contributions for Public GEOSS are shown below. All entries are hyperlinked to the database and one can test how it works (by clicking on red-colored items).

2009
Assessing the value of information for water quality management in the North Sea, Bouma, J. A.; van der Woerd, H. J.; Kuik, O. J. , Journal of Environmental Management, Volume 90, Number 2, p.1280-1288, (2009)**Abstract**
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 Export: **Tagged XML BibTex**
Earth observations for terrestrial biodiversity and ecosystems, Muchoney, Douglas M. , Remote Sensing of Environment, Volume 112, Number 5, p.1909-1911, (2008) **Abstract**
 Export: **Tagged XML BibTex**
Getting biodiversity intactness indices right: ensuring that biodiversity reflects diversity, Faith, D. P.; Ferrier, S.; Williams, K. J. , Global Change Biology, Volume 14, Number 2, p.207-217, (2008) **Abstract**
 Export: **Tagged XML BibTex**
Globale Geodaten helfen in Mosambik. GEOSS, GMES, UN-SPIDER im Einsatz, Zeil, P. , GIS Business, Number 3, p.28-30, (2008)
 Export: **Tagged XML BibTex**
GEO Information Sheets , GEO , Geneva, p.30, (2008)
 Export: **Tagged XML BibTex**
GEO 2009-2011 Work Plan - Version 2, GEO , Geneva, p.47, (2008)
 Export: **Tagged XML BibTex**

Towards a global climate observing system, Fellous, Jean-Louis , Interdisciplinary Science Reviews, Volume 33, p.83-94, (2008) **Abstract**
Export: **Tagged XML BibTex**

Uses and limitations of observations, data, forecasts, and other projections in decision support for selected sectors and regions, U.S. Climate Change Science Program, Subcommittee on Global Change Research , Washington, D.C., p.73, (2008)
Export: **Tagged XML BibTex**

2007

A review on reflective remote sensing and data assimilation techniques for enhanced agroecosystem modeling, Dorigo, W. A.; Zurita-Milla, R.; de Wit, A. J. W.; Brazile, J.; Singh, R.; Schaepman, M. E. , International Journal of Applied Earth Observation and Geoinformation, Volume 9, Number 2, p.165-193, (2007)**Abstract**
Export: **Tagged XML BibTex**

Ascribing societal benefit to applied remote sensing data products: an examination of methodologies based on the Multi-angle Imaging SpectroRadiometer experience, Molly K. Macauley; Dave Diner , Journal of Applied Remote Sensing, Volume 1, Number 1, p.013538, (2007) **Abstract**
Export: **Tagged XML BibTex**

Citizens as sensors: the world of volunteered geography, Goodchild, Michael , GeoJournal, Volume 69, Number 4, p.211-221, (2007) **Abstract**
Export: **Tagged XML BibTex**

Capturing the fugitive: Applying remote sensing to terrestrial animal distribution and diversity, Leyequien, Euridice; Verrelst, Jochem; Slot, Martijn; Schaepman-Strub, Gabriela; Heitkönig, Ignas M. A.; Skidmore, Andrew , International Journal of Applied Earth Observation and Geoinformation, Volume 9, Number 1, p.1-20, (2007) **Abstract**
Export: **Tagged XML BibTex**

The Space Economy at a Glance 2007, OECD , Paris, p.105, (2007) **Abstract**
Export: **Tagged XML BibTex**

2006

Ascribing Societal Benefit to Environmental Observations of Earth from Space: The Multiangle Imaging SpectroRadiometer (MISR) , Macauley, M. K. , p.27, (2006) **Abstract**
Export: **Tagged XML BibTex**

GMES Review Study on In-Situ Monitoring - Final Draft, Höller, Robert; Banko, Gebhard , p.124, (2006)
Export: **Tagged XML BibTex**

Report of International Workshop on Spatial Data Infrastructures'Cost-Benefit / Return onInvestment,European Commission , Number EUR 22294 , Ispra, p.57, (2006)
Export: **Tagged XML BibTex**

Socio-Economic Benefits Analysis of GMES - Main Report, PricewaterhouseCoopers , Number 18868/05, p.205, (2006)
Export: **Tagged XML BibTex**

Socio-Economic Benefits Analysis of GMES - Annexes, PricewaterhouseCoopers , Number 18868/05, p.97, (2006)
Export: **Tagged XML BibTex**

The value of information: Measuring the contribution of space-derived earth science data to resource management, Macauley, M. K. , Space Policy, Volume 22, Number 4, p.274-282, (2006) **Abstract**
Export: **Tagged XML BibTex**

2005

Advantages and disadvantages of prizes in a portfolio of financial incentives for space activities, Macauley, M. K. , Space Policy, Volume 21, Number 2, p.121-128, (2005) **Abstract**
Export: **Tagged XML BibTex**

A multidisciplinary multi-scale framework for assessing vulnerabilities to global change, Metzger, Marc J.;Leemans, Rik; Schröter, Dagmar , International Journal of Applied Earth Observation and Geoinformation, Volume 7, Number 4, p.253-267, (2005) **Abstract**
Export: **Tagged XML BibTex**

Earth observing Something to watch over us, Lubick, Naomi , Nature, Volume 436, Number 7048, p.168-169, (2005)
 Export: **Tagged XML BibTex**

EU Research for Sustainable Earth Observation - Watching the World for a better Tomorrow, European Commission , Volume EUR 21457, Brussels, p.20, (2005)
 Export: **Tagged XML BibTex**

Report on the mapping of Growing Stock, Biomass and Increment on European Forests Contribution to Work Package 1 Data - the inventory data, flux tower network, FAPAR , Van Brusselen, Jo; Päivinen, Risto;Schelhaas, Mart-Jan; Pussinen, Ari; Schuck, Andreas , p.52, (2005)
 Export: **Tagged XML BibTex**

Space 2030: Tackling Societys Challenges Complete Edition, OECD , Paris, p.328, (2005) **Abstract**
 Export: **Tagged XML BibTex**

The global earth observation system of systems (GEOSS), Lautenbacher, C.C. Jr. , Local to Global Data Interoperability - Challenges and Technologies, p.47- 50, (2005) **Abstract**
 Export: **Tagged XML BibTex**

2004

African Climate Report. A Report Commissioned by the UK Government to Review African Climate Science, Policy and Options for Action, Washington, Richard; Harrison, Mike; Conway, Declean , London, p.45, (2004)**Abstract**
 Export: **Tagged XML BibTex**

Draft GEOSS 10-Year Implementation Plan - REFERENCE DOCUMENT , IPTT , Number 203-1, Geneva, p.148, (2004)
 Export: **Tagged XML BibTex**

2003

A Herculean task? Economics, politics, and realigning government in the case of US polar-orbiting weather satellites, Macauley, Molly K. , Space Policy, Volume 19, Number 4, p.249-259, (2003) **Abstract**
 Export: **Tagged XML BibTex**

2002

An Agent-Based Model for Quantifying the Economic Value of Geographic Information, Krek, Alenka , Faculty of Science and Informatics, Institut for Geoinformation, Vienna, p.150, (2002) **Abstract**
 Export: **Tagged XML BibTex**

2001

Inception Study to Support the Development of a Business Plan for the GALILEO Programme - Final Report,PricewaterhouseCoopers , Number TREN/B5/23, p.86, (2001)
 Export: **Tagged XML BibTex**

1999

How valuable is remotely sensed information? The case of tropical deforestation modelling, Bounfour, A.;Lambin, E. F. , Space Policy, Volume 15, Number 3, p.149-158, (1999) **Abstract**
 Export: **Tagged XML BibTex**

1997

Some Dimensions of the Value of Weather Information: General Principles and a Taxonomy of Empirical Approaches , Molly K. Macauley , Workshop on the Social and Economic Impacts of Weather April 2 - 4 1997, Boulder, Colorado, USA, p.13, (1997)
 Export: **Tagged XML BibTex**

1995

NASAs earth observations commercialization applications program A model for government promotion of commercial space opportunities, Macauley, M. K. , Space Policy, Volume 11, Number 1, p.53-65, (1995) **Abstract**
 Export: **Tagged XML BibTex**

VALUE OF IMPROVED LONG-RANGE WEATHER INFORMATION, Richard M. Adams, Kelly J. Bryant, Bruce A. Mccarl, David M. Legler, James OBrien, Andrew Solow, Rodney Weiher, , Contemporary Economic Policy, Volume 13, Number 3, p.10-19, (1995) **Abstract**
 Export: **Tagged XML BibTex**

2.2 <u>GEOBENE</u> Benefit Assessment Database

Within the GEOBENE consortium we are collecting various project-internal case studies for a benefit assessment of Earth Observation (EO). The GEOBENE Benefit Assessment Database provides consortium members an overview of the different societal benefits from (improved) Earth Observation. Based on the collected comprehensive information on project-internal case studies (e.g. qualitative and quantitative, benefit area etc), consortium partners can effectively obtain, share and exchange knowledge about the current and future benefits of Earth Observation. The GEOBENE Benefit Assessment Database is presented only for consortium partners – the access to the detailed information source is restricted to the registered users in the GEOBENE web page.

2.2.1 Login Access

The GEOBENE Benefit Assessment Database for the EO-related case studies is located in a restricted realm of the GEOBENE website. To access the GEOBENE Benefit Assessment Database, an individual user account is required. Consortium members can go to the login page from the link "Login for consortium members" at the bottom of the GEOBENE main page (http://www.geo-bene.eu):

Home   **Public GEOSS**   **Contact us**   **Disclaimer**   **Search**

Geobene

▼ **About GEOBENE**
- ○ **Project Partners**
- ○ **Partner roles/skills**
- ○ **Funding**
- ▸ **Research**
- ▼ **Public GEOSS**
  - ○ **View Public GEOSS Benefit Assessment Database**
  - ○ **Online Submission**
- ○ **Applications**
- ○ **Public Documents**
- ○ **Dissemination Material**
- ○ **Glossary**
- ○ **Archive**

Quotes

Over the next decade, a Global Earth Observation System of Systems (GEOSS) will revolutionize our understanding of the Earth and how it works, producing societal benefits through more coordinated observations, better data management, increased data sharing and timely applications.
• Conrad C. Lautenbacher

About the GEOBENE project

Global earth observations may be instrumental to achieve sustainable developme date there have been no integrated assessments of their economic, social and envir benefits.

The objective of the EC sponsored project "**G**lobal **E**arth **O**bservation – **B**enefit **Es Now, N**ext and **E**merging" (**GEOBENE**) is to develop methodologies and analytica assess societal benefits of **GEO** in the domains of: Disasters, Health, Energy, Water, Weather, Ecosystems, Agriculture and Biodiversity.

The assessment will be carried out using quantitative and qualitative methods and 36-months-project led by **IIASA**'s **Forestry Program** aims at drawing up policy co from the modeling exercise for supporting the implementation of international agree

Energy	Biodiversity	Climate
Disasters	Ecosystem	Agriculture
Health	Water	Weather
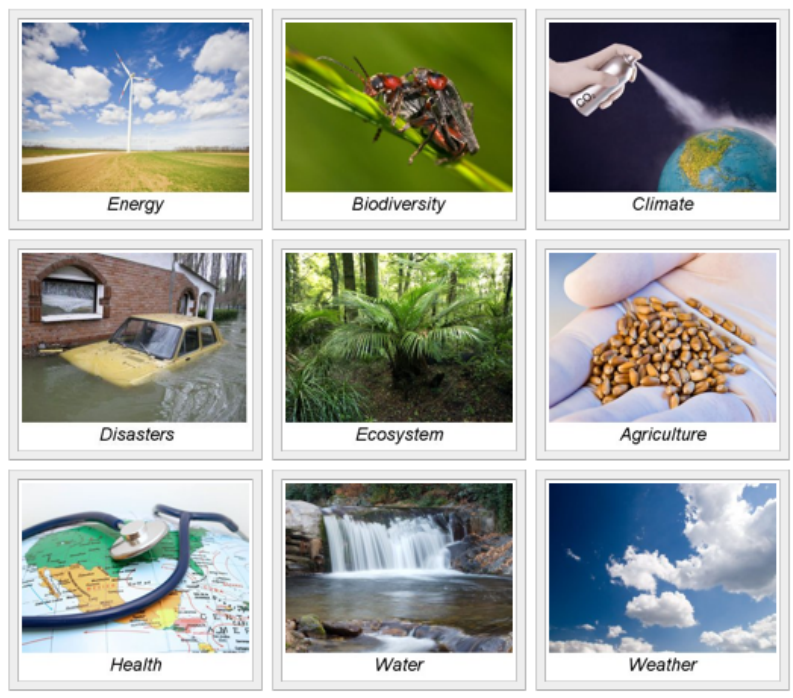
This project is funded by the European Commission

Login for consortium members   "Fern" theme by **John Handelaar**, May 2006. Satellite header image cou

By clicking on the login link, the following login page appears. The user is then asked to enter a username and password to get access to the restricted realm:
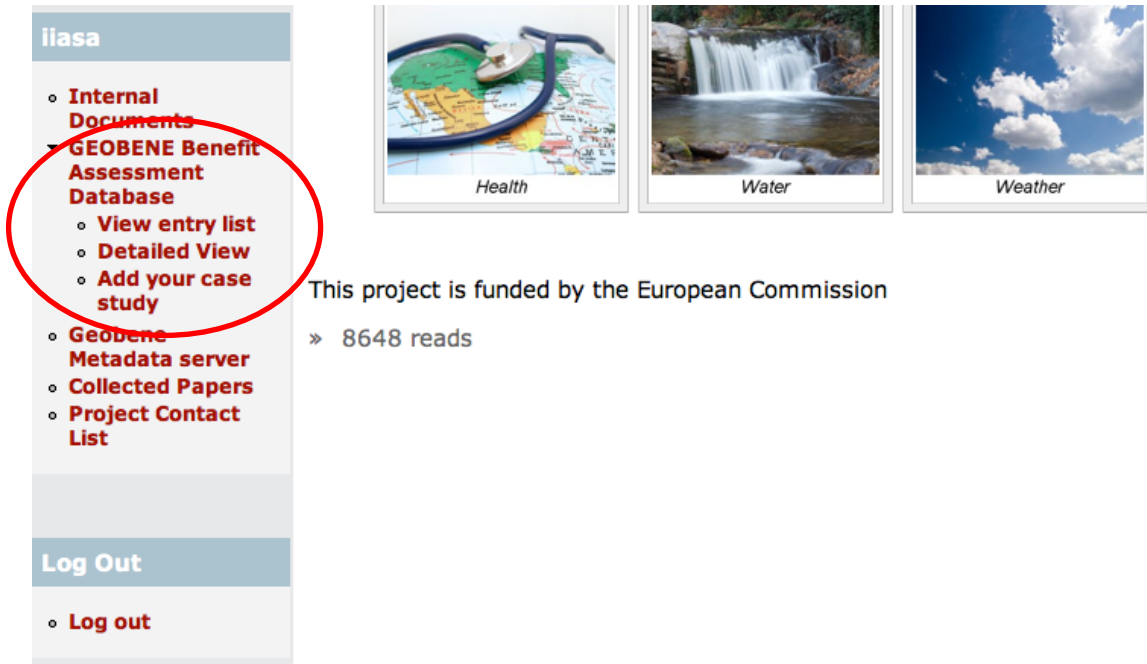
2.2.2 Navigation and Instructions

When the user has successfully logged in, several additional navigation blocks show up on the left side of the GeoBene web page (see below, i.e. "IIASA", "Log Out" and "Admin" bars in this case). These navigation blocks are only visible for logged-in consortium members and normal unregistered internet users – both unregistered consortium members and non-consortium internet users cannot see and reach them on the web. In the "IIASA" navigation block, one can see the menu "GEOBENE Benefit Assessment Database" (below).

From this menu, logged-in users can view the lists of all case studies stored in the GEOBENE Benefit Assessment Database ("View entry list" and "Detailed View") and go to the online submission page of the project-internal case studies ("Add your case study").

liasa

- Internal Documents
- GEOBENE Benefit Assessment Database
  - View entry list
  - Detailed View
  - Add your case study
- Geobene Metadata server
- Collected Papers
- Project Contact List

Log Out

- Log out

Health   Water   Weather

This project is funded by the European Commission

» 8648 reads

The instructions about this database are visualized by clicking on the menu "GEOBENE Benefit Assessment Database" (below). To add project-internal case studies on Earth Observation, we provide two user-friendly options;

1. Consortium members can send case study information (including related documents and datasets) to our web administrators via E-mail, and

2. Consortium members can go to our online form (the same link as "Add your case study") for case study submission and fill in/upload information by themselves.

2.2.3 Adding a Case Study

If a user clicked on the item "Add your case study" (below), an online submission page appears automatically. Note that a user can alternatively go to the same page by clicking on "online form" in the instruction text.
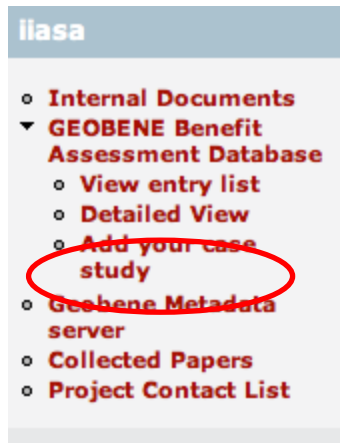
Home » GEOBENE Benefit Assessment Database

Submit GEOBENE Benefit Assessment case study

Please fill in the following fields for your case study on the GEOBENE Benefit Assessment Database. The entry fields with asterisk "*" are the mandatory fields for the submission.

---Contact details---

Name:

[   ]

Contact name for this study

EMail: *

[   ]

Title of Assessment: *

[   ]

status:

[▼]

Indicating if the project is finished, start, advanced or very advanced

Area: *

[General   ▼]

Sub-Area:

[   ]

The sub area of the benefit, (e.g. Area: Disaster --> Sub-areas "Wild land fires", "Earthquakes", "Volcanoes", "volcanic Ash and Aerosols" etc..)

Date of Project:

[   ]

Date of project, or time span

Cross Benefit Areas:

[   ]

Benefits in other areas e.g. Health, Disasters, Energy, Climate, Water, Weather, Ecosystems, Biodiversity, Agriculture

When will Benefits materialize?:

[   ]

Time/In the Future year(s) for which the benefits apply or time period for which benefits are expected in the future

Observational Requirements:

[   ]
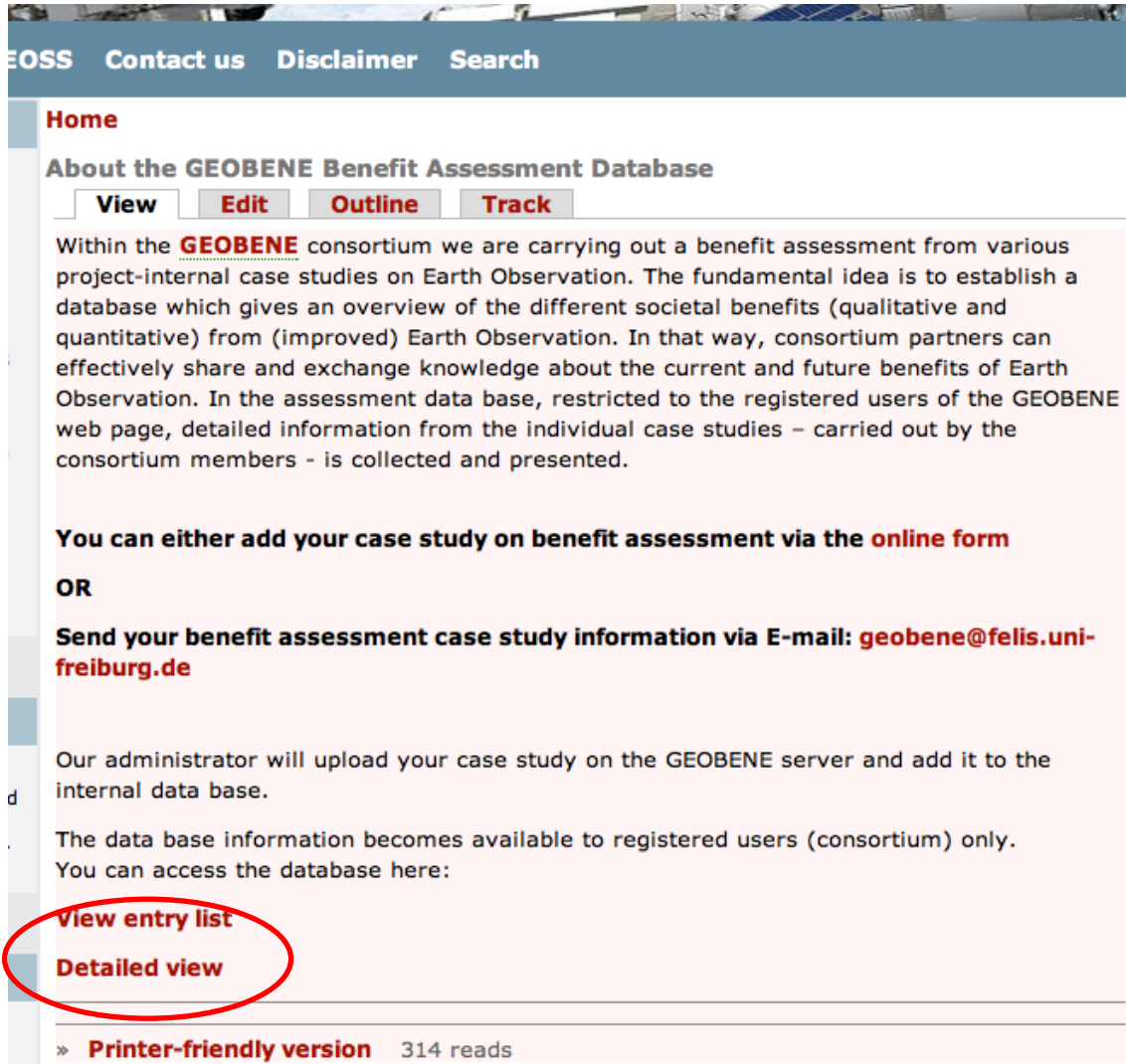
Observational/Institutional Requirements what spatial and temporal resolution is needed, (e.g. sensors, ground measurements), initiatives which help to achive the benefit

Benefit baseline:

[   ]

Benefit baseline The benefit baseline could be without the observation, without a specific use of EO for a specific application, without GMES or without GEOSS

2.2.4 Viewing Database Entries

To view database entries, a member user can choose either "View entry list" or "Detailed View" (below). Alternatively, these links are provided in the menu "GEOBENE Benefit Assessment Database" on the left block "IIASA" as explained above.

When the link "View entry list" was selected, a user can browse all case studies. By default, all case study entries are listed. If a user wants to look at only case studies of a specific Social Benefit Area, a user can select one of the benefit areas in the drop-down list (below).

GEO-BENE Benefit Assessment List

| View | Edit | Clone | Export |

Please select one of the Social Benefit Area (**SBA**) you are interested in.
Then please press "Submit" button.
All entries for the selected SBA are listed below.

Social Benefit Area

[Is One Of ▼]
[<All> ▼]   (Submit)

CAPTCHA
Place a challenge here for untrusted users.

Title	Area △	Sub-Area	Date of project	involved Partners
Global nutrient balance through food production	Agriculture	nutrient cycle, food production	02/2007-11/2007	Eawag, IFPRI, IIASA
Global EPIC Model	Agriculture	data, model	06/2007-06/2009	boku, eawag, sscri, nies (associated partner)
Modelling scenarios of global wood supply and trade	Agriculture	Forestry, Wood market		
Estimating future Afforestation/Deforestation	Agriculture	Land use change	2006-2008	
Systematic planning of protected areas	Biodiversity	Systematic Conservation Planning	2006-2007	SANBI
Meta-analysis of biodiversity valuation studies	Biodiversity		2007-2008	
Kruger Park Hypothetical Redesign	Biodiversity	Systematic conservation planning	2007	SANParks
meta analysis of biodiversity literature	Biodiversity		march 2007-december 2007	IVM
Climate change Mitigation Benefits though Avoidance of Deforestation	Climate	Land Use, Land Cover Change	01.06.2006	
Conceptual Models for the Role and Benefits of EO and Modeling	Climate		4/2007-6/2009	PIK
Optimal Strategy when Facing Tipping points with Multiple Uncertain Thresholds: Value of Information when Reducing Uncertainty	Climate	Extreme events		PIK, IIASA
Societal Constraints on Attainability Domains for a Multi-Society Climate-Economy Model	Climate			PIK, IIASA
Impact of Weather Observations on Fighting Forest Fires	Disasters	Forest fires		IIASA, KTL
Value of information in decision making	Disasters	weather	around now	
Socio-economic Benefits from Global Earth Observations	Disasters		2007	IIASA

1 2 3 4 next › last »

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Title	Area △	Sub-Area	Date of project	involved Partners
Earthquakes GEOSS Benefits Assessment	Disasters	Earthquakes		
Floods GEOSS Benefit Assessment	Disasters	Floods		IIASA & KTL
Droughts GEOSS Benefit Assessment	Disasters	Droughts		
Wind Storm GEOSS Benefit Assessment	Disasters	Wind Storm		
Volcanoes GEOSS Benefit Assessment	Disasters	Volcanoes		
Tsunamis/Sea Level Rise GEOSS Benefit Assessment	Disasters	Tsunamis/Sea Level Rise		
Slides/Avalanches GEOSS Benefit Assessment	Disasters	Landslides/Avalanches		
Overall Disaster GEOSS Benefit Assessment	Disasters	Combining results from the sub-areas: - Earthquakes - Forest Fires - Floods - Droughts - Wind Storms - Volcanoes - Tsunamis/Sea Level Rise - Slides/Avalanches		
Food Security in Africa	Disasters	Food security, drought	~ 1 year	
Case study in the use and application of GEO data in tsunami disaster recovery	Disasters	Tsunami	1 year	IIASA FOR/RAV
Increasing confidence in percipitation trends and area inter-correlations by combining in-situ data with satellite observations	Disasters	drought	01/04/2007	IIASA
Risk Maps and Probability concepts, Value of improved geo-and weather information, a case study on Malawi.	Disasters			
BIOMASS: proposed P-Band space mission scientific benefit assessment	Ecosystems		7/2007-12/2008	PIK, IIASA and others (non-Geo-Bene)
Improvement of global terrestrial carbon cycle modelling through EO data	Ecosystems		6/2001-7/2007	PIK, IIASA
meta analysis of wetland studies	Ecosystems	wetlands	january 2007- july 2007	IVM

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Title	Area ▲	Sub-Area	Date of project	involved Partners
mta analysis of coral reefs	Ecosystems	marine resources	october 2006- july 2007	IVM
Costs of monitoring emissions from deforestation and degradation	Ecosystems	Deforestation	June 2008 - September 2008	
Sustainable potential supply of bioenergy	Energy	Bioenergy	May 2007 - April 2008	BeWhere modeling group
Valuing Information Using Different Risk Measures & Real Options in a Portfolio Framework	Energy	Power Generation	2007	IIASA
Detecting optimal position of city roofs for Photovoltaics from LIDAR data	Energy	Solar	June 2007 - Nov 2007	FELIS, IIASA
Extending the Global Energy Model to support Solar Power	Energy	Solar	Fall 2007 - Summer 2009	FELIS, IIASA, other outside geobene
Optimal Location of Wood Gasification Plants for Methanol Production With Heat Recovery	Energy	methanol production	2008	--
Extended a wind power model to support the global geographic explicit renewable energy model	Energy	wind	summer 2007	
Impact of Policy Uncertainty on Power Plant Generation Choice	Energy	Power generation	2008	none
Expert assessment of the relative returns to GEO investment	General	biodiversity, climate, ecosystem, water, disaster, agriculture, energy, weather	sept 2007- may 2008	IVM, IIASA
Analysis of the GEOSS envisaged geodata infrastructure and it's impact on GEOSS and related fields	General	geodata		FELIS
Global Partnership in Global Earth Observation	General	Coalition formation	11/2007 - 11/2008	IIASA, BOKU
Sustainability GeoScope: Expanding GEOSS into the human domain	Health		7/2006- 6/2009	PIK, IIASA
HeatHeart	Health	Acute Myocardial Infaction	10/2006 - 06/2007	KTL & PIK
Environment and daily asthma attacks	Health	Asthma	07/2007 - 2008	KTL + outside partners

Title	Area▲	Sub-Area	Date of project	involved Partners
Flexible age-grouping	Health	Epidemiological methodology	05/2007- 08/2007	KTL
The benefits of using RMS for water quality management in the North sea	Water	marine resources	march- sept 2007	IVM
Impacts of climate change on crop production and agricultural water requirement	Water	climate change, water, food	05/2007- 12/2008	Eawag, IIASA
Managing the Great Barrier Reef: the value of GEO information	Water	Coral reefs, marine resources	september 2007- september 2008	IVM, CSIRO
Evolution of the oxygen content in the world ocean	Water	Oceanography	2006 - 2008	KTL + Penn. State University (USA)
Using Real Options to Time a Satellite Mission	Weather	-	5/2007-12/2007	none

2.2.5 Individual Entry Details

A user can also click on the title of each case study to look into more details of the individual entries. For instance, by clicking on the title "Environment and daily asthma attacks", a user can find a detailed description about this case study:

Home

Environment and daily asthma attacks

| View | Edit | Outline | Track | Workflow |

EMail:
elena.moltchanova@ktl.fi
Name:
Elena Moltchanova
status:
planned
Area:
Health
Sub-Area:
Asthma
When will Benefits materialize?:
Now, Next and Emerging
Date of Project:
07/2007 - 2008
Cross Benefit Areas:
Weather, Disasters
Observational Requirements:
Daily weather conditions, daily air-quality, daily asthma attacks, population-at-risk
Benefit baseline:
current
Is this a literature study?:
n
Expected Improvement of EO :
Better patients' and clinics' preparedness for asthma incidence variability
Benefit Pathway:
Better enviromental conditions prediction might lead to improved preparedness by patients
and clinics to high-risk asthma situations
Type of benefit assessment/illustration:
a case study + cost-benefit assessment
Assumptions:
The risk of asthma attacks is influenced by environmental conditions. Susceptible individuals
might avoid high-risk situations if warned.
Comments/Discussion:
Success contingent on the incidence data availability and successful partnership negotiations
Study Area:
Finland/Helsinki
Literature & Other Sources:
Ho WC, Hartley WR, Myers L, Lin MH, Lin YS, Lien CH, Lin RS. Air pollution, weather, and
associated risk factors related to asthma prevalence and attack rate. Environ Res. 2007;
104(3):402-9. Pönkä A, Virtanen M. Asthma and ambient air pollution in Helsinki. J Epidemiol
Community Health 1996;50 Suppl 1:s59-62 Lagorio S, Forastiere F, Pistelli R, Iavarone I,
Michelozzi P, Fano V, Marconi A, Ziemacki G, Ostro BD. Environ Health. 2006;5:11
Partners:
KTL + outside partners
Project funded By:
EU + outside sources

» **Add new comment**   **mark as spam**   **mark as not spam**   **report spam**   4 reads

By clicking on the link "Detailed View", a user can browse all lists of detailed case study
information by default (below). A user can also select a Social Benefit Area from the

drop-down list. In addition, this detailed view is useful to print out all detailed database entries.

2.2.6 Database Statistics

The overview statistics of the GEOBENE Benefit Assessment Database are shown below. The number of studies collected in the database is indicated by the classification of Social Benefit Area.

2.2.7 Listing of All Entries

All case study entries are listed below according to the classification of Social Benefit Area:

Agriculture
Global nutrient balance through food production
EMail:
water21water@yahoo.com
Name:
Junguo Liu
status:
started
Area:
Agriculture
Sub-Area:
nutrient cycle, food production
When will Benefits materialize?:
Present
Date of Project:
02/2007-11/2007
Cross Benefit Areas:
Water, Ecosystems
Observational Requirements:
High resolution fertilizer data
Benefit baseline:
Without observation of organic and inorganic fertilizer application
Is this a literature study?:
N
Expected Improvement of EO :
Nutrient inputs, outputs and balance in food production process on a global scale with spatial resolution of 0.5 degree
Auxillary Data Used:
IFPRI land use data, FAO livestock density maps
Benefit Pathway:
Generate new datasets with the GEPIC model by integrating earth observation data
Type of benefit assessment/illustration:
Global models, GIS Spatial Analysis
Assumptions:
The advances of recent released high resolution information make the assessment of nutrient balance possible. The assessment will contribute to better soil nutrient management.
Qualitative:
Added value through integation of earth observation data
Quantitative:
Papers to be writen
Gap Analysis:
High resolution fertilizer data are not available
Study Area:
global
Literature & Other Sources:
1. Liu J., Jimmy R. Williams, Zehnder A.J.B., Yang H., 2007. GEPIC – modelling wheat yield and crop water productivity with high resolution on a global scale. Agricultural Systems 94(2): 478-493. 2. Liu J., Wiberg D., Zehnder A.J.B., Yang H., 2007. Modeling the role of irrigation in winter wheat yield and crop

water productivity in China. Irrigation Science. In Pess. doi 10.1007/s00271-007-0069-9 3. Liu J., Zehnder A.J.B., Yang H., 2007. Historical trend in China's virtual water trade. Water International 32 (2). In Press. 4. Liu J., Zehnder A.J.B., Yang H., 2007. Global consumptive water use for crop production: the importance of green water and virtual water. Submitted to Water Resources Research. 5. Liu J., Savenije H.H.G., Xu J., 2003. Water as an economic good and water tariff design – comparison between IBT-con and IRT-cap. Physics and Chemistry of the Earth 28 (4-5): 209-217. 6. Liu J., Savenije H.H.G., Xu J., 2003. Forecast of water demand in Weinan City in China using artificial neural networks. Physics and Chemistry of the Earth 28 (4-5): 219-224.

Related links and previous case studies:
Previous study on Water Scarcity - Its Measurement and Implications for Virtual Water Import, supported by Swiss National Science Foundation and EAWAG
Partners:
Eawag, IFPRI, IIASA
Project funded By:
GEO-BENE

Attachment	Size
GEPIC.pdf	705.11 KB
GEPIC_China.pdf	490.64 KB

»
Global EPIC Model
EMail:
erwin.schmid@boku.ac.at
Name:
Erwin Schmid
status:
planned
Area:
Agriculture
Sub-Area:
data, model
Date of Project:
06/2007-06/2009
Cross Benefit Areas:
biodiversity, climate, water, weather
Observational Requirements:
climate data, land cover and land use, management, soil
Expected Improvement of EO :
crop yields, data validation, environmental impact, integrated models
Quantitative:
physical units
Benefit Pathway:
forecast of crop yield and environmental impact
Type of benefit assessment/illustration:
process-based models
Assumptions:
validate data information systems
Gap Analysis:
insufficient earth observation data, gaps in methodology
Study Area:
global
Project funded By:
geo-bene
Partners:
boku, eawag, sscri, nies (associated partner)

»
Modelling scenarios of global wood supply and trade

Area:
Agriculture
status:
planned
Sub-Area:
Forestry, Wood market
When will Benefits materialize?:
25
Cross Benefit Areas:
Energy
Observational Requirements:
Forest yield levels Increment curves Wood demand Wood quality and size Harvest costs Transport costs Slope map
Is this a literature study?:
n
Benefit baseline:
current status
Expected Improvement of EO :
Higher precision in global estimates of future wood supply and forest growth Higher precision in future forestry sector carbon balance Better estimates of ecosystem response
Benefit Pathway:
Higher precision in global estimates of future wood supply and forest growth -> improves model estimates of expected timber trade, this enables projections of the performance of world regions under globalization Higher precision in future forestry sector carbon balance -> more knowledge about future sinks and sources from forest sector, improving projections of CO2 concentrations Better estimates of ecosystem response to managemnt and climate change -> helps to optimize management of forest ecosystems to ensure wood supply and other ecosystem services
Type of benefit assessment/illustration:
Comparison between different scenarios with and without improved information
Gap Analysis:
Forest age class distribution on global level Forest tree species distribution Costs and prices of harvest Timber quality distribution
Study Area:
global
Project funded By:
GEOBENE
»
Estimating future Afforestation/Deforestation

EMail:
kinder@iiasa.ac.at
Name:
Georg Kindermann
status:
started
Area:
Agriculture
Sub-Area:
Land use change
When will Benefits materialize?:
100
Date of Project:
2006-2008
Cross Benefit Areas:
Biodiversity, Climate, Ecosystem

Observational Requirements:
Forest cover Population development Agriculture Revenue Land price Crop Yield
Benefit baseline:
Scenarios with and without better data
Is this a literature study?:
n
Expected Improvement of EO :
More accurate predictions of afforested and deforested areas
Qualitative:
Relation between avoided deforestatoin and invested money
Benefit Pathway:
Investigations on all forests Investigations only on forest which have a high deforestation pressure
Type of benefit assessment/illustration:
Case study
Study Area:
Global
Literature & Other Sources:
*) Predicting the deforestation-trend under different carbon-prices: Georg E Kindermann, Michael Obersteiner, Ewald Rametsteiner and Ian McCallum; Carbon Balance and Management 2006, 1:15, doi:10.1186/1750-0680-1-15 *) FAO: Global Forest Resources Assessment 2005, Progress towards sustainable forest management. Volume 147. FAO Forestry Paper. Rome: ood and Agriculture Organization of the United Nations; 2005. *) Benítez PC, Obersteiner M: Site identification for carbon sequestration in Latin America: A grid–based economic approach. Forest Policy and Economics 2006, 8:636-651. *) Obersteiner M, Alexandrov G, Benítez PC, McCallum I, Kraxner F, Riahi K, Rokityanskiy D, Yamagata Y: Global Supply of Biomass for Energy and Carbon Sequestration from Afforestation/Reforestation Activities. Mitigation and Adaptation Strategies for Global Change 2006, 1381-2386. *) IPCC. 2007. Climate Change: Synthesis Report, Intergovernmental Panel on Climate Change. Cambridge University Press. *) Bala, K.G. Caldeira, M. Wickett, T. J. Phillips, D. B. Lobell, C. Delire, and A. Mirin, 2007. Combined climate and carbon-cycle effects of large-scale deforestation. PNAS April 9, 10.1073/pnas.0608998104 *) Williams M. 2003. Deforesting the Earth – from Prehistory to Global Crisis, The University of Chicago Press, Chicago, 2003. *) Schaeffer Roberto, Ricardo Leonardo Vianna Rodrigues; William F. Laurance, Ana K. M. Albernaz, Philip M. Fearnside, Heraldo L. Vasconcelos, and Leandro V. Ferreira. 2005. Underlying Causes of Deforestation. Science (18 February 2005): 1046-1047. *) DeFries Ruth S., Richard A. Houghton, Matthew C. Hansen, Christopher B. Field, David Skole, and John Townshend. 2002. Carbon emissions from tropical deforestation and regrowth based on satellite observations for the 1980s and 1990s. PNAS 99:14256-14261.
Project funded By:
GeoBene, Insea
Web link:
http://www.cbmjournal.com/content/1/1/15/abstract
»

Biodiversity
Systematic planning of protected areas
EMail:
breyers@csir.co.za
Name:
Belinda Reyers
status:
advanced
Area:
Biodiversity
Sub-Area:
Systematic Conservation Planning
When will Benefits materialize?:
5
Date of Project:

2006-2007
Cross Benefit Areas:
Ecosystems
Observational Requirements:
Land cover, distributions (presence/absence) of individual species
Benefit baseline:
Globally available information
Is this a literature study?:
n
Expected Improvement of EO :
Global information for species with transboundary distribution More accurate and better-resolved distribution data from in situ onbservations, and land cover from remote sensing
Auxillary Data Used:
Topography, climate surfaces, protected area maps
Qualitative:
30-50% improvement
Quantitative:
(possible, but not yet available)
Benefit Pathway:
Better information->more precise location of protected areas to achive a given conservartion target -> lower cost of land acquisition, greated biodiversity benefit for given cost
Type of benefit assessment/illustration:
Application of state-of-the art systematic consevation planning tools (eg C-Plan) to the coarse and fine resolution data. Use the opportunity cost of the difference in selected conservation priorities as the benefit metric
Assumptions:
Value of biodiversity benefit is captured by the opportunity cost of creation of protected areas, which is in turn reflected in the acquistion cost of the land.
Gap Analysis:
The analysis is based on plant, bird and mammal data. Fish, amphibia and invertebrates are not included.
Comments/Discussion:
Work in progress.
Study Area:
global, national and local (multiscale assessment)
Literature & Other Sources:
Driver, A 2006 National Spatial Biodiversity Assessment. Strelizia 17. South African National Biodiversity Institute, Pretoria.
Project funded By:
GEOBENE, CSIR and South African government
Partners:
SANBI
»
Meta-analysis of biodiversity valuation studies
EMail:
onno.kuik@ivm.vu.nl
Name:
Onno Kuik
status:
started
Area:
Biodiversity
Date of Project:
2007-2008
Cross Benefit Areas:
Ecosystems
Is this a literature study?:

y
Expected Improvement of EO :
Information on economic value of biodiversity conservation
Type of benefit assessment/illustration:
Meta analysis of literature on the economic benefits of biodiversity conservation
Comments/Discussion:
The meta analysis will not directly provide estimates of the benefits of earth observation, but it is meant to provide information that can be used in the assessment of these benefits.
Study Area:
Global
Project funded By:
EUFP6, CASES, GEO-BENE
»
Kruger Park Hypothetical Redesign
EMail:
bscholes@csir.co.za
Name:
Bob Scholes
status:
very advanced
Area:
Biodiversity
Sub-Area:
Systematic conservation planning
When will Benefits materialize?:
5
Date of Project:
2007
Observational Requirements:
protected area boundaries, ecosystem maps (both terrestrial and freshwater), species location records for fish and aquatic vertebrates, DEM, river flow records.
Benefit baseline:
Comparison of best available information (2007) versus the outcome in the virtual absence of iinformation (1898, when the Kruger Park was founded)
Is this a literature study?:
n
Expected Improvement of EO :
The location of the KNP was determined by historical accident, not using any earth observations at all. The 'replanning' was done using best available information, mostly from in situ biodiversity observations.
Qualitative:
30-50% more biodiversity protection for same area protected
Quantitative:
(not yet available)
Benefit Pathway:
Better information -> optimal location of protected area ->greater biodiversity protection for a given investment
Type of benefit assessment/illustration:
Applied comlimentarity analysis (CPLAN) to generate an optimised conservation outcome vs area protected curve for both freshwater and terrestrial ecosystem. Compared with the conservation outcome under the current layout.
Gap Analysis:
Dont really know the economic value of the benefit, and it will be hard to calculate the actual cost of the information used.
Study Area:
sub-national
Literature & Other Sources:

Roux, D et al (in prep) Optimising freshwater conservation: Lessons from a hypothetical redesign of the Kruger National Park. Conservation Biology

Project funded By:
Water Research Commission of South Africa
Partners:
SANParks
»
meta analysis of biodiversity literature
EMail:
onno.kuik@ivm.vu.nl
Name:
onno kuik
status:
started
Area:
Biodiversity
When will Benefits materialize?:
at present
Date of Project:
march 2007-december 2007
Cross Benefit Areas:
ecosystems
Is this a literature study?:
yes (plus statistical analysis)
Expected Improvement of EO :
more effective management and hence more protected biodoversity.
Quantitative:
yes
Benefit Pathway:
revealaed and stated preferences methods
Type of benefit assessment/illustration:
meta analysis of existing economic studies valuing biodiversity
Study Area:
global
Partners:
IVM
»
Climate
Climate change Mitigation Benefits though Avoidance of Deforestation
Area:
Climate
status:
finished
Sub-Area:
Land Use, Land Cover Change
When will Benefits materialize?:
future / 2006-2026
Date of Project:
01.06.2006
Cross Benefit Areas:
Ecosystems, Biodiversity
Observational Requirements:
Satellites which can monitor deforestation / biomass
Is this a literature study?:
no literature study
Benefit baseline:

GMES versus no GMES
Expected Improvement of EO :
Reduction of deforestation / better control
Auxillary Data Used:
-
Quantitative:
1 - 4.4 bn/yr
Benefit Pathway:
monitoring and control of deforstation through better and co-ordianted deforestation, credibility of method to be applied in post Kyoto negotiations, avoidance of deforestation, calculation of benefit by using social cost of carbon
Type of benefit assessment/illustration:
stakeholder survey with 104 participants
Assumptions:
better, co-ordianted monitoring of deforestation leads to more effective international agreements
Gap Analysis:
Insufficient capabilities to measure biomass
Comments/Discussion:
high uncertainty with social cost of carbon, GMES benefit contribution is difficult since it depends upon a future international policy beeing ageed
Study Area:
global
Literature & Other Sources:
PricewaterHouseCoopers, 2006, Socio-Economic Benefit Analysis of GMES, ESA Contract Number 18868/05, Main Report, Date 2006
»
Conceptual Models for the Role and Benefits of EO and Modeling
EMail:
Matthias.Schmidt@pik-potsdam.de
Name:
Matthias Schmidt
status:
started
Area:
Climate
When will Benefits materialize?:
2000-2100
Date of Project:
4/2007-6/2009
Cross Benefit Areas:
Ecosystems, Agriculture
Benefit baseline:
No observation/modeling - no reduction of uncertainties in the system.
Is this a literature study?:
n
Qualitative:
No effect of anticipation
Quantitative:
250 Billion US$
Benefit Pathway:
Better observation leads to more uncertainty reduction leads to better informed future decision leads to enhanced global welfare
Type of benefit assessment/illustration:
Estimation of expected values of future information about key uncertainties in the Earth system. Optimal global abatement strategies are calculated under uncertainty and future learning using an intermediate-complexity climate-economy model. The welfare difference to a strategy without learning gives the

benefits or value of information for the uncertainty under consideration. Uncertainty about climate sensitivity was already investigated

Assumptions:
Learning about climate sensitivity from future global mean temperature measurements (not including learning from paleo-data)

Gap Analysis:
Almost no gaps

Study Area:
global

Literature & Other Sources:
- Nordhaus, W.D. and D. Popp, "What is the value of scientific knowledge? An application to Global Warming Using the PRICE Model", \\ - Kelly, D.L. and C.D. Kolstad, "Bayesian learning, growth and pollution", J. of Economic Dynamics & Control 23, 491, 1999

Project funded By:
Geo-Bene

Partners:
PIK

»

Optimal Strategy when Facing Tipping points with Multiple Uncertain Thresholds: Value of Information when Reducing Uncertainty

EMail:
rokity@iiasa.ac.at

Name:
Rokityanskiy Dmitry

status:
started

Area:
Climate

Sub-Area:
Extreme events

Cross Benefit Areas:
Disaster

Is this a literature study?:
n

Benefit Pathway:
observations will lead to less uncertainty therefore reducing total costs and making the climate change strategy better

Type of benefit assessment/illustration:
Stochastic Discontinuous Optimization Attainability Analysis

Study Area:
global

Partners:
PIK, IIASA

»

Societal Constraints on Attainability Domains for a Multi-Society Climate-Economy Model

Area:
Climate

status:
planned

Is this a literature study?:
N

Comments/Discussion:
This activity is not followed up...

Partners:
PIK, IIASA

»

Disasters

Impact of Weather Observations on Fighting Forest Fires

EMail:
khabarov@iiasa.ac.at
Name:
Nikolay Khabarov
status:
started
Area:
Disasters
Sub-Area:
Forest fires
When will Benefits materialize?:
Now and emerging
Observational Requirements:
Ground measurements: daily weather data.
Benefit baseline:
No baseline presented.
Is this a literature study?:
Some literature is attached
Expected Improvement of EO :
Saved forest, reduced CO2 emissions
Auxillary Data Used:
JRC-AGRIFISH interpolated weather data
Benefit Pathway:
Optimization of air patrolling strategy through better weather information
Type of benefit assessment/illustration:
Forest fires model based on Nesterov index
Assumptions:
The main method to early detect forest fire is air patrolling
Qualitative:
Forest fires reduction
Quantitative:
reduction of burned forest area by 25%
Gap Analysis:
Insufficient wather data
Comments/Discussion:
The adequacy of the model has to be checked and calibrated for particular region
Study Area:
Europe/Russia
Literature & Other Sources:
Venevsky et al.
Partners:
IIASA, KTL
Project funded By:
GEO-BENE

Attachment	Size
Present-GEO-BENE-070604-FF-02.pdf	404.52 KB
CostsFireFighting.pdf	196.34 KB
FAO-UN-2006.pdf	1.78 MB
FireSoread-Ellipse.ppt	1.5 MB
FireSpreadContour-2.pdf	498.82 KB

Attachment	Size
FireSpreadContour-4.pdf	1.35 MB
FireSpread-Ellipse.pdf	377.41 KB
FireVelocity.pdf	159.22 KB
GOST22-1-09.html.txt	51.3 KB
IR_10.pdf	740.36 KB
j.1365-2486.2002.00528.pdf	861.76 KB
j.1466-822x.2001.00175.pdf	547.78 KB
FireSpreadContour-3.pdf	2.98 MB
RosForestFiresStatistics.html.txt	591.39 KB
RosleshizPrikaz.htm_.txt	258.18 KB
SaturatedVapourPressure.pdf	350.41 KB
CEOS-2001-fire-report.doc	135 KB

»
Value of information in decision making

EMail:
odrobina@fmph.uniba.sk
Name:
igor odrobina
status:
started
Area:
Disasters
Sub-Area:
weather
When will Benefits materialize?:
-
Date of Project:
around now
Cross Benefit Areas:
all areas
Observational Requirements:
-
Benefit baseline:
decision without decision model
Is this a literature study?:
y
Expected Improvement of EO :
-
Auxillary Data Used:
-
Qualitative:
yes
Quantitative:
yes
Type of benefit assessment/illustration:
model building - case study
Assumptions:

-
Gap Analysis:
-
Comments/Discussion:
-
Study Area:
global and regional
Literature & Other Sources:
Craig W. Kirkwood Decision Tree Primer (avail on web)
 Sven Ove Hansson Decision Theory - A
Brief Introduction (avail on web)
»
Socio-economic Benefits from Global Earth Observations
EMail:
smirnov@iiasa.ac.at
Name:
Alexey Smirnov
status:
advanced
Area:
Disasters
Date of Project:
2007
Type of benefit assessment/illustration:
Agregated macroeconomical modelling of GEOSS-type activity of society.
Qualitative:
Research proves the existense (due to economical reasons) of free-rider problem in GEOSS activity
Partners:
IIASA
Project funded By:
GEO-BENE

Attachment	Size
geobene_Smirnov_040607.ppt	611 KB

»
Earthquakes GEOSS Benefits Assessment
EMail:
khabarov@iiasa.ac.at
Name:
Nikolay Khabarov
status:
planned
Area:
Disasters
Sub-Area:
Earthquakes

Attachment	Size
Earthquake-An-Overview.pdf	295.1 KB
Earthquake-Big-Overview.pdf	78.77 KB
Earthquake-Kobe.pdf	324.41 KB
Earthquake-Pred-EEPAS.pdf	717.77 KB
Earthquake-Predict-EMR.pdf	573.17 KB
Earthquake-Predict-Greece.pdf	247.47 KB

Attachment	Size
Earthquake-Prediction.pdf	588.08 KB
Earthquake-Prediction-Radon.pdf	239.78 KB
Earthquake-Prediction-RTP.pdf	757.54 KB
Earthquake-Predict-Italy.pdf	1.36 MB
Earthquake-Predict-Mediterranian.pdf	447.05 KB
Earthquake-Predict-NASDA.pdf	555.69 KB
Earthquake-Predict-NearSpace.pdf	1.11 MB
Earthquake-Predict-Overview-2.pdf	119.63 KB
Earthquake-Predict-Overview.pdf	345.25 KB
Earthquake-Predict-PS-100.pdf	2.7 MB
Earthquake-Predict-SAMPEX.pdf	599.67 KB
Earthquake-Predict-ThermalWaters.pdf	471.02 KB
Earthquake-Predict-ULF-2.pdf	891.97 KB
Earthquake-Predict-ULF.pdf	372.45 KB
Earthquake-Pred-Stats.pdf	840.14 KB

»
Floods GEOSS Benefit Assessment
EMail:
khabarov@iiasa.ac.at
Name:
Nikolay Khabarov
status:
planned
Area:
Disasters
Sub-Area:
Floods
Partners:
IIASA & KTL

Attachment	Size
Flood-Venice.pdf	482.76 KB
Flood-Alsdorf.pdf	3.16 MB
Floods-Bates.pdf	123.71 KB
Wilson and Atkinson.pdf	496.29 KB
Sanders AWR 2007.pdf	4.43 MB

»
Droughts GEOSS Benefit Assessment
EMail:
khabarov@iiasa.ac.at
Name:
Nikolay Khabarov
status:

planned
Area:
Disasters
Sub-Area:
Droughts

Attachment	Size
Drought-BookReview.pdf	37.98 KB
Drought-Forecast-Brolley-Florida.pdf	1.09 MB
Drought-Forecast-Fiorillo-Italy.pdf	994.36 KB
Drought-Forecast-Lybbert-Kenya.pdf	435.64 KB
Drought-Forecast-Meko-Sacramento.pdf	1.73 MB
Drought-Forecast-Mishra-India.pdf	683.38 KB

»
Wind Storm GEOSS Benefit Assessment
EMail:
khabarov@iiasa.ac.at
Name:
Nikolay Khabarov
status:
planned
Area:
Disasters
Sub-Area:
Wind Storm

Attachment	Size
Hurricane-Atlas.pdf	1.6 MB
Hurricane-Evacuation-Dow.pdf	247.51 KB
Hurricane-Evacuation-Urbina.pdf	474.39 KB
Hurricane-Evacuation-Whitehead.pdf	221.32 KB
Hurricane-Flooding-Cheung.pdf	2.21 MB
Hurricane-Keim.pdf	366.33 KB
Hurricane-Oey.pdf	3.54 MB
Hurricane-Pytharoulis.pdf	844.34 KB
Hurricane-Waves-Phadke.pdf	821.23 KB

»
Volcanoes GEOSS Benefit Assessment
EMail:
khabarov@iiasa.ac.at
Name:
Nikolay Khabarov
status:
planned
Area:
Disasters
Sub-Area:
Volcanoes

Attachment	Size
Volcanoes-Indonesia.pdf	785.9 KB
Volcano-Earthquake-Cigolini.pdf	1.59 MB
Volcano-Earthquake-Iceland.pdf	333.82 KB
Volcano-Forecast-Roman.pdf	534.74 KB
Volcano-Japan-Utado.pdf	1.27 MB

»

Tsunamis/Sea Level Rise GEOSS Benefit Assessment

EMail:
khabarov@iiasa.ac.at
Name:
Nikolay Khabarov
status:
planned
Area:
Disasters
Sub-Area:
Tsunamis/Sea Level Rise

Attachment	Size
Tsunami-BlackSea.pdf	450.9 KB
Tsunami-Bathymetry.pdf	1.8 MB
Tsunami-GPS.pdf	373.94 KB
Tsunami-India-2004.pdf	2.92 MB
Tsunami-Model-Cho.pdf	353.84 KB
Tsunami-Monitoring-Italy.pdf	341.79 KB

»

Slides/Avalanches GEOSS Benefit Assessment

EMail:
khabarov@iiasa.ac.at
Name:
Nikolay Khabarov
status:
planned
Area:
Disasters
Sub-Area:
Landslides/Avalanches

Attachment	Size
Avalanches-Prediction.pdf	714.09 KB
Avalanches-Norway.pdf	1.6 MB
LandSlides-Mexico.pdf	1.71 MB
Avalanches-Debris.pdf	1.61 MB
Avalanches-Landslides-CollectingData.pdf	1.02 MB

»

Overall Disaster GEOSS Benefit Assessment

EMail:
khabarov@iiasa.ac.at
Name:
Nikolay Khabarov
status:
planned
Area:
Disasters
Sub-Area:
Combining results from the sub-areas: - Earthquakes - Forest Fires - Floods - Droughts - Wind Storms - Volcanoes - Tsunamis/Sea Level Rise - Slides/Avalanches
Literature & Other Sources:
Cardona OD, Hurtado JE, Duque G, Moreno A, Chardon AC, Velásquez LS, Prieto SD (2005) System of indicators for disaster risk management: program for Latin America and the Caribbean: main technical report. IDB/IDEA Program on Indicators for Disaster Risk Management, Universidad Nacional de Colombia, Manizales, Dilley, M et al. 2005, March.Natural Disaster Hotspots: A Global Risk Analysis. World Bank. UNDP (2004). "Reducing Disaster Risk: A Challenge for Development." United Nations Development Program – Bureau for Crisis Prevention and Recovery (BRCP): New York. Mechler, R., S. Hochrainer, J. Linnerooth-Bayer and G. Pflug (2006). "Public Sector Financial Vulnerability to Disasters. The IIASA CATSIM Model." United Nations University. Hochrainer, S. (2006) Macroeconomic Risk Management against Natural Disasters. German University Press

Attachment	Size
All-GIS.pdf	374.72 KB
All-GlobalDisasters.pdf	1023.42 KB
All-IndianProgram.pdf	865.09 KB
All-Satellites.pdf	1.86 MB
All-SpaceTech.pdf	2.33 MB
All-Disasters-Alexander.pdf	471.49 KB

»
Food Security in Africa
EMail:
bscholes@csir.co.za
Name:
Bob Scholes (who suggested this idea, but does not necessarily want to do it)
status:
planned
Area:
Disasters
Sub-Area:
Food security, drought
When will Benefits materialize?:
5 years
Date of Project:
~ 1 year
Cross Benefit Areas:
Agriculture, energy (hydro)
Observational Requirements:
ENSO prediction system
Benefit baseline:
No ENSO prediction system
Is this a literature study?:
N

Expected Improvement of EO :

Integrated ocean moored arrays, satellite-based seasurface temperatures and long-term climate models lead to a higher probability of correct predictions in the drought-affected areas, more accurate estimates of yield losses, and longer warning periods

Auxillary Data Used:

Yield models, population distribution, food stocks

Quantitative:

Should be possible

Benefit Pathway:

Better, more timeous information means that the amount of aid shipped matches the demand, avoiding underprovision (which leads to malnutrition and death) or overprovision (which has an opportunity cost)

Type of benefit assessment/illustration:

Explicit cost-benefit calculation is possible because there are only a few information providers (eg IRI at Columbia University), and only a few users (the disaster relief agencies)

Gap Analysis:

What the EO community have missed completely in this example is the neccesity to have equally-good observational data on the consumption and livelihood adjustement side of the food balance equation.

Comments/Discussion:

I think this would be an achievable and very politically convincing example.

Study Area:

Southern And Eastern Africa (both very sensitve to food insecurity linked to ENSO

Literature & Other Sources:

GCOS Africa Observation System Plan - brought out by IRI last year

»

Case study in the use and application of GEO data in tsunami disaster recovery

EMail:

mccallum@iiasa.ac.at, fritz@iiasa.ac.at

Name:

Ian McCallum/Steffen Fritz

status:

started

Area:

Disasters

Sub-Area:

Tsunami

When will Benefits materialize?:

Benefits are immediate

Date of Project:

1 year

Benefit baseline:

Prior to Tsunami (Dec, 2004)

Is this a literature study?:

N

Expected Improvement of EO :

Better response to disasters, better recovery during cleanup period. Better reporting to funding agencies. Improved access to data and better understanding of what data is of most benefit in a disaster region.

Qualitative:

understanding which data products are required and which products provide the best information.

Quantitative:

Can perhaps show in dollar terms groups involved in recovery effort and how much of their efforts are tied to timely access to good quality spatial information.

Benefit Pathway:

Indirect - better access to spatial information could allow for improved disaster recovery.

Type of benefit assessment/illustration:

Will form a combination of a stakeholder survey and a case study example.

Assumptions:

It is assumed that spatial data is useful in disaster recovery.

Gap Analysis:

This will be performed.

Comments/Discussion:

Study limited by what information the recovery database can provide, and what our local contacts are able to tell us. In addition, we would rely on the agencies who use spatial data to accurately report how it is used and it's perceived importance.

Study Area:

Regional (Sumatra, Indonesia)

Literature & Other Sources:

GMES, 2006. Main Report: Socio-Economic Benefits Analysis of GMES. ESA Contract No. 18868/05. 205 pp. HTTP://www.respond-int.org/Respond/ HTTP://rand.brr.go.id/RAND/ HTTP://unosat.web.cern.ch/unosat/ HTTP://www.gisdevelopment.net/technology/gis/techgi0030pf.htm HTTP://www.esri.com/news/arcnews/spring07articles/recovery-efforts.html

Project funded By:

Geo-bene

Partners:

IIASA FOR/RAV

»

Increasing confidence in percipitation trends and area inter-correlations by combining in-situ data with satellite observations

EMail:

fritz@iiasa.ac.at

Name:

Steffen Fritz

status:

started

Area:

Disasters

Sub-Area:

drought

When will Benefits materialize?:

next 20 years

Date of Project:

01/04/2007

Cross Benefit Areas:

Disaster

Observational Requirements:

rainfall gauge measurements, decadal NDVI measurements, ECMWF forecasts

Benefit baseline:

only one dataset available - without data integration of NDVI and rainfall data

Is this a literature study?:

no literature study

Expected Improvement of EO :

reduction of uncertainty in percipitation trends and area correlations in Africa / with special focuss on the Horn of Africa, Ethiopia, Mozambique

Auxillary Data Used:

administrative areas FAO GAUL level 1/2, AFRICOVER, GLC-2000

Qualitative:

How would investment strategy change when more information is integrated

Quantitative:

Benefit Pathway:

combining rain gauge measurements with NDVI data derived from AVHRR satellite observations increases confidence in certain precipitation patterns. This information can be used in different fields, e.g. early waring to identify future drought prone areas as well as in the insurance sector to attract insurance companies to invest in areas in africa where non or inverse correlated precipitation patterns exist.

Type of benefit assessment/illustration:
case study on the integration of in-situ measurements with Satellite observations to improve knowledge of precipitation trends and improve investment strategies of insurance companies.
Assumptions:
more confidence in precipitation trends will deliver crucial information for early warning; more confidence in non-correlated precipitation patterns will lead to insurance companies to invest in African drought prone countries/regions
Gap Analysis:
missing good and dense network of rain gauge measurements in most of africa, errors in ECMWF data, NDVI patterns do not correlate in all areas with rainfall (e.g. not well correlated in forests)
Comments/Discussion:
Generally historical climate data over africa is poor, by integrating climate data from different sources the method proposed here can help to gain more insight into current and future climate patterns over africa
Study Area:
Africa/ horn of Africa, Ethiopia, Mozambique
Literature & Other Sources:
Fritz and Rojas, 2007, An analysis of 21 years of NDVI and 30 years of precipitation data on a province level for the Horn of Africa with respect to population, agriculture and vulnerable people, International Symposium on Remote Sensing of Environment, 25th - 29th of June 2007, San José, Costa Rica
Project funded By:
EU
Partners:
IIASA
»
Risk Maps and Probability concepts, Value of improved geo-and weather information, a case study on Malawi.
EMail:
hochrainer@iiasa.ac.at
Name:
Hochrainer, Stefan
status:
advanced
Area:
Disasters
Observational Requirements:
Regional Climate Models
Expected Improvement of EO :
Insurability assessment
Literature & Other Sources:
Bals, C., Butzengeiger, S., Warner, K.. Insuring the Uninsurable: Design Options for a Climate Change Funding Mechanism. Climate Policy (forthcoming). Embrechts, P. C. Klüppelberg, T. Mikosch (1997) Modeling Extreme Events. Springer Verlag: Berlin. Gadgil S, Rao PRS, Rao KN (2002). Use of climate information for farm-level decision-making: rainfed groundnut farming in southern India. Agric Syst 74:431–457. Global Environmental Facility (2004). GEF Assistance to Address Adaptation. GEF/C.23/Inf.8/Rev.1. GEF: Washington, DC. Geman, H. Ed. (1999). Insurance and Weather Derivatives: From Exotic Options to Exotic Underlyings (Risk Books, London, 1999). Giorgi, F. (2007), Regional climate modeling: Status and perspectives, in Boutron, C. From Regional Climate Modelling to the Exploration of Venus, J. Phys. IV France 139 (2006) 101-118, DOI: 10.1051/jp4:2006139008 Hess, U. and Syroka, H. (2005) Weather-Based Insurance in Southern Africa. The Case of Malawi, World Bank, Washington, D.C., USA. Hess, U. and Syroka, H. (2005) Weather-Based Insurance in Southern Africa. The Case of Malawi, World Bank, Washington, D.C., USA. Tadross, M.A., Jack C., and Hewitson B.C. (2005). On RCM-based projections of change in southern African summer climate. Geophysical Research Letters, 32(23), L23713, doi 10.1029/2005GL024460. Tadross, M. (2006). Evidence of a changing climate in Malawi, Mozambique and Zambia: analysis of daily rainfall data and regional models. Report for project "Institutions for Climate Change Adaptation," Development Economics Research Group, Infrastructure and

Environment Unit, World Bank: Washington DC. World Bank (2005). Managing Agricultural Production Risk. Washington DC, World Bank.

»

Ecosystems

BIOMASS: proposed P-Band space mission scientific benefit assessment

EMail:
Wolfgang.Lucht@pik-potsdam.de
Name:
Wolfgang Lucht
status:
started
Area:
Ecosystems
When will Benefits materialize?:
2013-2018
Date of Project:
7/2007-12/2008
Cross Benefit Areas:
Energy, Agriculture, Biodiversity
Observational Requirements:
Global-scale biomass measurements. Here: Realisation and launch of proposed ESA P-Band space radar mission BIOMASS. But study will apply to other mission concepts as well.
Benefit baseline:
Without BIOMASS space mission
Is this a literature study?:
n
Expected Improvement of EO :
Carbon cycle modelling, water cycle modelling, disturbance and regrowth mapping, woody bioenergy planatation monitoring
Auxillary Data Used:
Observed globally gridded climate data (temp, precip, rad). Global soil property data base.
Benefit Pathway:
Reduction of uncertainty in IPCC-relevant projections.
Type of benefit assessment/illustration:
Use of 3 Dynamic Global Vegegation Models (LPJmL, Orchidee, SDGVM). Use of biomass ground data (tropics, boreal, fluxnet sites).
Study Area:
Global, focus on tropical and boreal forests
Partners:
PIK, IIASA and others (non-Geo-Bene)
Project funded By:
ESA, GEO-Bene

»

Improvement of global terrestrial carbon cycle modelling through EO data

EMail:
Wolfgang.Lucht@pik-potsdam.de
Name:
Wolfgang Lucht
status:
finished
Area:
Ecosystems
When will Benefits materialize?:
1982-2003
Date of Project:
6/2001-7/2007

Observational Requirements:
AVHRR fPAR time series, 0.5 degrees globally, monthly
Benefit baseline:
Dynamic Global Vegetation Model simulations without use of EO data
Is this a literature study?:
n
Expected Improvement of EO :
Improved spatial and temporal patterns of vegetation activity; better carbon and water cycle simulations
Auxillary Data Used:
Gridded monthly time series of global climate data from weather stations (CRU-PIK climatology, 1901-2003).
Qualitative:
Improved carbon, water cycle simulation for late 20th century
Type of benefit assessment/illustration:
Assimilation of EO data into the LPJ Dynamic Global Vegetation Model
Study Area:
global
Project funded By:
German BMBF, EU-fp6
Partners:
PIK, IIASA
Related links and previous case studies:
CVECA (BMBF-DEKLIM), SIBERIA-II (EU-fp6)
»
meta analysis of wetland studies
EMail:
onno.kuik@ivm.vu.nl
Name:
Onno Kuik
status:
advanced
Area:
Ecosystems
Sub-Area:
wetlands
When will Benefits materialize?:
present
Date of Project:
january 2007- july 2007
Cross Benefit Areas:
biodiversity, water
Is this a literature study?:
yes, plus statistiscal analysis
Quantitative:
yes
Benefit Pathway:
revealed and stated preferences methods
Type of benefit assessment/illustration:
meta analysis of existing economic studies valuing wetlands
Study Area:
Global
Partners:
IVM
»
mta analysis of coral reefs
EMail:

Onno.kuik@ivm.vu.nl
Name:
Onno kuik
status:
advanced
Area:
Ecosystems
Sub-Area:
marine resources
When will Benefits materialize?:
present
Date of Project:
october 2006- july 2007
Cross Benefit Areas:
biodiversity, water
Is this a literature study?:
yes, plus statistiscal analysis
Quantitative:
yes
Benefit Pathway:
revealed and stated preferences methods
Type of benefit assessment/illustration:
Meta analysis of existing economic studies valuing the coral reef
Study Area:
Global
Partners:
IVM
»
Costs of monitoring emissions from deforestation and degradation
EMail:
bottcher@iiasa.ac.at
Name:
Hannes Boettcher
status:
started
Area:
Ecosystems
Sub-Area:
Deforestation
When will Benefits materialize?:
immediately
Date of Project:
June 2008 - September 2008
Cross Benefit Areas:
Biodiversity, Climate
Is this a literature study?:
n
»
Energy
Sustainable potential supply of bioenergy
EMail:
kinder@iiasa.ac.at
Name:
Georg Kindermann
status:
finished

Area:
Energy
Sub-Area:
Bioenergy
When will Benefits materialize?:
50
Date of Project:
May 2007 - April 2008
Cross Benefit Areas:
Ecosystems, Agriculture
Observational Requirements:
Forest area Yield level map (NPP) Human activity Accessibility Current and future demand on energy
Benefit baseline:
Sub-optimal location and size of biofuel plants (see BeWhere model project)
Is this a literature study?:
n
Expected Improvement of EO :
Optimal location and size of biofuel plants (see BeWhere model project) by improving model input data
Qualitative:
Allows optimal placement of wood processing companies (sawmill, powerplant).
Benefit Pathway:
Improvement of biomass map more accurate biomass supply potential optimal location of biofuel plants
Type of benefit assessment/illustration:
Scenario study
Comments/Discussion:
finished for Austria
Study Area:
global
Literature & Other Sources:
*) Predicting the deforestation-trend under different carbon-prices. Georg E Kindermann, Michael Obersteiner, Ewald Rametsteiner and Ian McCallum; Carbon Balance and Management 2006, 1:15 doi:10.1186/1750-0680-1-15 *) Assmann, Ernst : Vorläufige Fichten-Ertragstafel für Bayer 1963 / von E. Assmann und F. Franz . - 2. Aufl. . - München : Forstl. Forschungsanst., Inst. für Ertragskunde , 1972 . - 104 p. *) Assmann, Ernst : The principles of forest yield study : studies in the organic production, structure, increment and yield of forest stands / by Ernst Assmannn. Transl. by Sabine H. Gardiner . - 1. Engl. ed. . - Oxford [u.a.] : Pergamon Pr. , 1970 . - XIV, 506 p. *) Pretzsch, Hans : Modellierung des Waldwachstums : mit 10 Tabellen / Hans Pretzsch . - Berlin : Parey , 2001 . - XVI, 341 p. *) Waring, Richard H. : Forest ecosystems : analysis at multiple scales / Richard H. Waring ; Steven W. Running . - 2. ed. . - San Diego, Calif. [u.a.] : Acad. Press , 1998 . - XIV, 370 p. *) Sylvain Leduc: BIOFUELS Running cars on methanol, Options winter 2006, IIASA, p22-23.
Project funded By:
GEOBENE
Partners:
BeWhere modeling group
»
Valuing Information Using Different Risk Measures & Real Options in a Portfolio Framework
EMail:
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Name:
Nikolay Khabarov, Sabine Fuss, Jana Szolgayova
status:
finished
Area:
Energy
Sub-Area:
Power Generation

When will Benefits materialize?:
2000-2050
Date of Project:
2007
Cross Benefit Areas:
-
Observational Requirements:
Better Climate Models to reduce uncertainty about CO2 price
Benefit baseline:
Current CO2 price projections
Is this a literature study?:
n
Expected Improvement of EO :
Better development of energy strategy on a global scale
Auxillary Data Used:
CO2 prices scenario projection, electricity prices scenario projection
Benefit Pathway:
Observation -> Global climate model -> CO2 target levels -> Reduced uncertainty in CO2 prices -> Energy development policy
Type of benefit assessment/illustration:
Real options theory and optimal portfolio management theory
Assumptions:
Known trends and characteristics of CO2 / electricity / fuel prices. Technology improvement at certain level is assumed.
Qualitative:
Better energy strategy: higher returns (producer/investor benefit) at less risk (also energy security) with potentially lower emissions
Quantitative:
Technology shares in the portfolio change depending on the price scenario. Value of information/stable (predictable) prices = additional return if portfolio doesn't need to be stable across scenarios.
Gap Analysis:
extension in progress for explicit quanitfication of geobenefits by measuring the returns foregone by choosing portfolios robust across different CO2 price scenarios
Comments/Discussion:
basic version published in the "Journal of Energy Markets"; a more policy-focussed version coming up as a book chapter
Study Area:
Global
Literature & Other Sources:
Fortin, I., S. Fuss, N. Khabarov, M. Obersteiner, and J. Szolgayova (2008). "An Integrated CVaR and Real Options Approach to Investments in the Energy Sector." Journal of Energy Markets 1(2): 61–85.
Related links and previous case studies:
http://www.ihs.ac.at/publications/eco/es-209.pdf
Partners:
IIASA
Project funded By:
GeoBene

Attachment	Size
070604-GEO-BENE-CVaR.ppt	1.35 MB

»
Detecting optimal position of city roofs for Photovoltaics from LIDAR data
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Name:
Shifeng Wang, Christian Schill

status:
started
Area:
Energy
Sub-Area:
Solar
When will Benefits materialize?:
medium term
Date of Project:
June 2007 - Nov 2007
Observational Requirements:
LIDAR data from 3 cities in Baden-Wurttemberg (Germany)
Benefit baseline:
No LIDAR mission
Is this a literature study?:
n
Expected Improvement of EO :
Aspect of roofs, more precise roof area, more detailed yield map (for photovoltaic conversion). Cost savings for renewable energy distribution planning , GHG emission savings
Auxillary Data Used:
perhaps cadastral data, final energy demand
Quantitative:
need to check, will come
Benefit Pathway:
reduced total energy systems costs meeting polcy targets
Type of benefit assessment/illustration:
geographic explicit deterministisc regional energy model
Study Area:
Baden-Wurttemberg
Project funded By:
GeoBene
Partners:
FELIS, IIASA
»
Extending the Global Energy Model to support Solar Power
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Name:
Shifeng Wang, Michael Obersteiner, Christian Schill
status:
started
Area:
Energy
Sub-Area:
Solar
When will Benefits materialize?:
Medium
Date of Project:
Fall 2007 - Summer 2009
Observational Requirements:
Global Solar irradation maps; temporal resolution kWh/(m²months/day/hours), spatial resolution (depends on available data sets, at least 0.5x0.5deegrees)
Benefit baseline:
current solar energy potentials in existing global energy models
Is this a literature study?:
n

Expected Improvement of EO :
Improved estimations of solar energy potentials, improved assessment of intermittant solar energy supply
based on high temporal resolution (hourly) to really price the pv installation with real time energy prices,
Scenarios of large scale versus distributed solar energy supply
Auxillary Data Used:
historical temporal energy market prices
Benefit Pathway:
Cost saving of total global energy system costs due to improved supply schedules
Type of benefit assessment/illustration:
Integration of solar supply schedules for global energy system models and subsequent down-scaling of
results
Study Area:
gobal
Partners:
FELIS, IIASA, other outside geobene
Project funded By:
GeoBene
»
Optimal Location of Wood Gasification Plants for Methanol Production With Heat Recovery
EMail:
leduc@iiasa.ac.at
Name:
Sylvain Leduc
status:
finished
Area:
Energy
Sub-Area:
methanol production
Date of Project:
2008
Cross Benefit Areas:
-
Comments/Discussion:
final paper published in the "International Journal of Energy Research"
Partners:
--
Project funded By:
GeoBene
»
Extended a wind power model to support the global geographic explicit renewable energy model
Name:
To be discussed
status:
planned
Area:
Energy
Sub-Area:
wind
When will Benefits materialize?:
medium to long term
Date of Project:
summer 2007
Cross Benefit Areas:
Health, Climate
Observational Requirements:

threedimensional wind velocity maps derived from LIDAR data from latest satellite missions
Benefit baseline:
no wind data available
Is this a literature study?:
n
»
Impact of Policy Uncertainty on Power Plant Generation Choice
EMail:
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Name:
Sabine Fuss, Jana Szolgayova
status:
finished
Area:
Energy
Sub-Area:
Power generation
When will Benefits materialize?:
planning horizon is over the coming 150 years, i.e. a long-run perspective
Date of Project:
2008
Cross Benefit Areas:
-
Observational Requirements:
better information about climate sensitivity etc -> better informed CO_2 reduction policy -> more stable/predictable CO_2 prices -> gains for the producer AND gains in terms of emissions savings
Benefit baseline:
unknown CO_2 price development - stochastic optimization for all possible prices and all possible future states of the world
Is this a literature study?:
n
Expected Improvement of EO :
CO_2 prices (=extrapolation of current ETS trends) known ex ante = optimization under certainty
Auxillary Data Used:
The dataset used for this study is based on a survey by the International Energy Agency (IEA, 2005. "Projected costs of generating electricity – 2005 update." OECD/IEA, Paris). The projections for CO_2 prices and electricity prices were derived from the GGI Scenario Database (IIASA, 2007: available at http://www.iiasa.ac.at/Research/GGI/DB/), where the trend of the former is based on the GHG shadow prices provided in the database. Additional information about carbon capture and storage technologies and the involved costs can be found in the IPCC special report on CCS (http://arch.rivm.nl/env/int/ipcc/pages_media/SRCCS-final/IPCCSpecialReportonCarbondioxideCaptureandStorage.htm).
Benefit Pathway:
indirect: better EO inform policy-making and have thus a decisive impact on the transition from fossil-fuel-fired to renewable energy. As decisions are different in the light of better information, there is a positive value to gathering these information, since both profits will be higher (costs lower) and emissions will also be reduced.
Type of benefit assessment/illustration:
Real options analysis: the optimal decisions are computed both for known CO_2 prices and for unknown CO_2 prices and then the resulting outcomes (profits and emissions) are compared. -> The difference is the value of information, or the willingness of the investor/producer to pay for better information about CO_2 price development. Also the difference in emissions is positive, i.e. there are potential emissions savings when optimzation occurs under more certainty.
Assumptions:

We choose three technologies, which we think are representative for fossil-fuel-fired capacity (coal), retrofitted fossil-fuel-fired capacity (coal+CCS) and renewable energy (wind), which is a simplification, of course.

Qualitative:

More certainty about climate sensitivity through the acquisition of EO -> better informed climate change policy -> stable CO_2 prices -> positive value of information in terms of profits & emissions

Quantitative:

Value of information in terms of additional profits are computed as % to represent willingness to pay for better information; emissions savings are cumulative.

Gap Analysis:

-

Comments/Discussion:

final paper entitled "Impact of Climate Policy Uncertainty on the Adoption of Electricity Generating Technologies" submitted to Energy Policy

Study Area:

plant level analysis with implications for investment at the sector level

Literature & Other Sources:

see attached draft version of paper

Related links and previous case studies:

-

Partners:

Project funded By:

GeoBene

Web link:

-

Attachment	Size
fuss_etal_2008.pdf	142.6 KB

»

General

Expert assessment of the relative returns to GEO investment

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Name:

jetske Bouma

status:

planned

Area:

General

Sub-Area:

biodiversity, climate, ecosystem, water, disaster, agriculture, energy, weather

When will Benefits materialize?:

in the future (2007-2030)

Date of Project:

sept 2007- may 2008

Benefit baseline:

The baseline is the current situation, which will be compared with a situation with GEOSS

Is this a literature study?:

no

Expected Improvement of EO :

This is for the experts to assess, but expected benefits are lower (environmental)damages, lower monitoring costs, higher production, more efficient investment targettinbg, more effective enviornmental policy etc.

Qualitative:

yes
Quantitative:
we will try to get quantitative answers
Benefit Pathway:
direct (lower monitoring costs) and indirect (more efficient management)for all 9 social benefit areas.
Type of benefit assessment/illustration:
Stakeholder survey making use of Bayesian Decision Theory to quantitatively assess the value of information
Comments/Discussion:
we want to develop a questionnaire to assess the marginal benefits of GEO according to experts and senior decision makers for the 9 social benefit areas. Besides, we want to explore the shape of the benefit and cost curves for the different social benefit areas.
Study Area:
global
Literature & Other Sources:
Hirshleifer, J and J.G.Riley (1979). 'The analytics of uncertainty and information- an expository survey', Journal of economic literature 17: 1375-1421 Schimmelpfenning, D.E, and G.W.Norton (2003). 'What is the value of agricultural economics research ', American journal of agricultural economics 85 (1): 81-94 Macauley, M.K.(2006). 'The value of information: Measuring the contribution of space-derived earth science data to resource management', Space policy 22: 274—282 Ellison, A.M.(1996). 'An introduction to Bayesian inference for ecological research and environmental decision making', Ecological applications 6 (4): 1036-1046 Gollier, C and N.Treich (2003). 'Decision making under scientific uncertainty: the economics of the precautionary principle' the Journal of risk and uncertainty 27(1): 77-103 PricewaterhouseCoopers (2006). 'Socio economic benefits analysis of GMES', main report, ESA contract number 18868/05 financed by the European Commission.
Project funded By:
GeoBene
Partners:
IVM, IIASA
Related links and previous case studies:
North sea case study
»
Analysis of the GEOSS envisaged geodata infrastructure and it's impact on GEOSS and related fields
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Name:
Christian Schill
status:
planned
Area:
General
Sub-Area:

geodata

Is this a literature study?:

y

Partners:

FELIS

Project funded By:

geobene

»

Global Partnership in Global Earth Observation

EMail:

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Name:

Alexey Smirnov, Christine Heumesser

status:

planned

Area:

General

Sub-Area:

Coalition formation

Date of Project:

11/2007 - 11/2008

Partners:

IIASA, BOKU

»

Health

Sustainability GeoScope: Expanding GEOSS into the human domain

Area:

Health

status:

started

When will Benefits materialize?:

2000-2100

Date of Project:

7/2006-6/2009

Cross Benefit Areas:

Agriculture, Ecosystems, Biodiversity

Observational Requirements:

Probably ground-based socioeconomic and cultural expansions of GEOSS elements (spatial samples).
Integration of space data with human domain ground data.

Is this a literature study?:

y

Benefit baseline:

Without observation of social, economic and cultural systems.

Expected Improvement of EO :

Ability to theorize about the dynamics of the coupled anthropogenic system of environment+societies; this is not really possible without a solid empirical basis, but this is currently lacking in important dimensions with respect to socioeconomic and cultural dynamics.

Qualitative:

Paper(s) to be written.

Benefit Pathway:
Planning and monitoring of sectorial sustainability transitions.
Type of benefit assessment/illustration:
Literature and intellectual analysis, expert input.
Gap Analysis:
Time series of socioeconomic data frequently missing. No systematic data on key aspects, eg material flows through societies, time budgets, life styles and problem perception.
Study Area:
Global
Partners:
PIK, IIASA
Project funded By:
Geo-Bene
Related links and previous case studies:
Previous: PIK project Sustainability Geoscope Preparatory Project (with support by NKGCF and DFG)
»
HeatHeart
EMail:
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Name:
Elena Moltchanova
status:
very advanced
Area:
Health
Sub-Area:
Acute Myocardial Infaction
When will Benefits materialize?:
Now, Next and Emerging
Date of Project:
10/2006 - 06/2007
Cross Benefit Areas:
Weather
Observational Requirements:
Geo-referenced daily weather observations, geo-referenced AMI incidence data, geo-referenced population-at-risk data.
Benefit baseline:
current
Is this a literature study?:
N
Expected Improvement of EO :
Improved prediction of heart attack rate, and thus better clinical preparedness to deal with the demand-for-treatment variability.
Auxillary Data Used:
Finnish geo-referenced AMI incidence data, geo-referenced population-at-risk data.
Qualitative:
In Finland, the weather extreme are not large enough to significantly influence the weather.
Benefit Pathway:
Improved prediction of heart attack rate, and thus better clinical preparedness to deal with the demand-for-treatment variability.
Type of benefit assessment/illustration:
A case study of daily incidence of AMI in Finland for the years 1983, 1988 and 1993.
Assumptions:
Heart attack rate is influenced by daily weather.
Gap Analysis:
Other, e.g., European countries might yield better study material.

Comments/Discussion:
Although, the quantitative results, in case of Finland, did not prove to be significant, the developed methodology can easily be applied to other cases.
Study Area:
Seven larger Finnish cities
Literature & Other Sources:
de Bruin AM, van Rossum AC, Visser MC, Koole GM. Modeling the emergency cardiac in-patient flow. An application of queuing theory. Health Care Management Science 2007;10:125-137 Goerre S, Egli C, Gerber S, Defila C, Minder C, Richner H, Meier B. Impact of weather and climate on the incidence of acute coronary syndromes. Int J Cariol 2007; 118(1):36-40 Houck PD, Lethen JE, Riggs MW, Gantt DS, Dehmer GJ. Relation of atmospheric pressure changes and the occurrences of acute myocardial infarction and stroke. Am J Cardiol 2005; 96:45-51 Karvonen M, Moltchanova E, Viik-Kajander M, Moltchanov V, Rytkönen M, Kousa A, Tuomilehto J. Regional inequality in the risk of acute myocardial infarction in Finland: a case study of 35- to 74-year-old men. Heart Drug 2002;2:51-60 Kovats RS, Campbell-Lendrum D, Matthies F. Climate change and human health: estimating avoidable deaths and disease. Risk Anal 2005; 25:1409-18.
Project funded By:
EU
Partners:
KTL & PIK
»
Environment and daily asthma attacks
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Name:
Elena Moltchanova
status:
planned
Area:
Health
Sub-Area:
Asthma
When will Benefits materialize?:
Now, Next and Emerging
Date of Project:
07/2007 - 2008
Cross Benefit Areas:
Weather, Disasters
Observational Requirements:
Daily weather conditions, daily air-quality, daily asthma attacks, population-at-risk
Benefit baseline:
current
Is this a literature study?:
n
Expected Improvement of EO :
Better patients' and clinics' preparedness for asthma incidence variability
Benefit Pathway:
Better enviromental conditions prediction might lead to improved preparedness by patients and clinics to high-risk asthma situations
Type of benefit assessment/illustration:
a case study + cost-benefit assessment
Assumptions:
The risk of asthma attacks is influenced by environmental conditions. Susceptible individuals might avoid high-risk situations if warned.
Comments/Discussion:
Success contingent on the incidence data availability and successful partnership negotiations
Study Area:

Finland/Helsinki

Literature & Other Sources:

Ho WC, Hartley WR, Myers L, Lin MH, Lin YS, Lien CH, Lin RS. Air pollution, weather, and associated risk factors related to asthma prevalence and attack rate. Environ Res. 2007; 104(3):402-9. Pönkä A, Virtanen M. Asthma and ambient air pollution in Helsinki. J Epidemiol Community Health 1996;50 Suppl 1:s59-62 Lagorio S, Forastiere F, Pistelli R, Iavarone I, Michelozzi P, Fano V, Marconi A, Ziemacki G, Ostro BD. Environ Health. 2006;5:11

Partners:

KTL + outside partners

Project funded By:

EU + outside sources

»

EMail:

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Name:

Elena Moltchanova

status:

advanced

Area:

Health

Sub-Area:

Epidemiological methodology

When will Benefits materialize?:

Now

Date of Project:

05/2007-08/2007

Benefit baseline:

current 5-year age-group methodology

Is this a literature study?:

n

Expected Improvement of EO :

The conclusions of the studies, analysed using the proposed methodoloy, will be targeted at more specific age-groups.

Quantitative:

TBD

Benefit Pathway:

The proposed methodology will allow to identify intrinsic age-groups (vs. artificial 5-year/10-year age groups) thus leading to improved analysis and prediction of epidemiological data.

Type of benefit assessment/illustration:

Methodology development + simulation + illustration, using available acute myocardial infarction and/or diabetes incidence data.

Study Area:

globally applicable

Project funded By:

EU

Partners:

KTL

»

Water

The benefits of using RMS for water quality management in the North sea

EMail:

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Name:

Jetske Bouma, Institute for Environmental Studies, the Netherlands

status:

advanced
Area:
Water
Sub-Area:
marine resources
When will Benefits materialize?:
present (2007)
Date of Project:
march- sept 2007
Cross Benefit Areas:
ecosystems
Observational Requirements:
in situ monitoring of eutrofication, algal bloom and sea water clarity and additional RMS information
Benefit baseline:
existing water quality monitoring system
Is this a literature study?:
no literature study
Expected Improvement of EO :
better temporal and geographical spread of information which is expected to lead to lower monitoring and opportunity costs and early warning information which is expected to result in lower damage costs
Benefit Pathway:
mostly indirect (more effective water quality management) but some direct effects (lower monitoring costs)
Type of benefit assessment/illustration:
stakeholder survey (policy makers, water managers, researchers etc)using Bayesian decision THeory
Assumptions:
that decision makers are capable of quantitatively assessing the uncertainties involved with water quality management in the North sea
Qualitative:
lower damage, lower monitoring costs
Quantitative:
in progress
Gap Analysis:
uncertainty of GEO information, extend to which information is actually used
Comments/Discussion:
valuation of benefits of information is ongoing
Study Area:
Nothe sea
Literature & Other Sources:
Nunes, P and J.van den Bergh (2004). Can people value protection against invasive species? Evidence from a joint TC-survey in the Netherlands, Environmental and resource economics 28:517-532 McQuatters-Gollop, M, D.E.Raitsos, M.Edwards, Y.Pradhan en M.J.Attrill (2007). ' A long term chlorophyll data set reveals regime shift in North sea phytoplankton biomass unconnected to nutrient trends', Limnol. Oceanogr. 52 (2): 625-648 Woerd, H vd et al. (2005). Integrated spatial and spectral characterisation of harmful algal bloom in Dutch coastal waters (ISCHA)-Demonstration of a HAB service in the Zeeuwse Voordelta. IVM report R 05/09, Amsterdam Brouwer, R, H.van der Woerd, M.Eleveld and A.Wagtendonk (2006) Valuing the North sea: assessing the public benefits of marine protection and sustainable management of the North sea, report R06-04, IVM, the Netherlands Turner et al (1999) Managing nutrient fluxes and pollution in the Baltic sea: an interdisciplinary simulation study, Ecological economics 30: 333-352
Partners:
IVM
Project funded By:
GeoBene

Attachment	Size
schimmelpfennig&norton.pdf	153.93 KB

»

EMail:
water21water@yahoo.com
Name:
Junguo Liu
status:
planned
Area:
Water
Sub-Area:
climate change, water, food
When will Benefits materialize?:
Present
Date of Project:
05/2007-12/2008
Cross Benefit Areas:
Agriculture
Observational Requirements:
Up-to-date climate and soil data in each grid cell
Is this a literature study?:
N
Expected Improvement of EO :
The change of water requirement and yield due to climate change
Auxillary Data Used:
Up-to-date climate and soil data in each grid cell
Benefit Pathway:
The impacts of climate change on food production and water use will be simulated with the best available input datasets
Type of benefit assessment/illustration:
The GEPIC model, GIS Spatial analysis
Assumptions:
With the available up-to-dated earth observation data, GEPIC can simulate the impacts of climate change on food production and water requirement
Qualitative:
Added value through integation of earth observation data
Gap Analysis:
daily climate data in earch grid are not available; up-to-dated soil data are valuable
Study Area:
global
Literature & Other Sources:
1. Liu J., Jimmy R. Williams, Zehnder A.J.B., Yang H., 2007. GEPIC – modelling wheat yield and crop water productivity with high resolution on a global scale. Agricultural Systems 94(2): 478-493. 2. Liu J., Wiberg D., Zehnder A.J.B., Yang H., 2007. Modeling the role of irrigation in winter wheat yield and crop water productivity in China. Irrigation Science. In Pess. doi 10.1007/s00271-007-0069-9 3. Liu J., Zehnder A.J.B., Yang H., 2007. Historical trend in China's virtual water trade. Water International 32 (2). In Press. 4. Liu J., Zehnder A.J.B., Yang H., 2007. Global consumptive water use for crop production: the importance of green water and virtual water. Submitted to Water Resources Research. 5. Liu J., Savenije H.H.G., Xu J., 2003. Water as an economic good and water tariff design – comparison between IBT-con and IRT-cap. Physics and Chemistry of the Earth 28 (4-5): 209-217. 6. Liu J., Savenije H.H.G., Xu J., 2003. Forecast of water demand in Weinan City in China using artificial neural networks. Physics and Chemistry of the Earth 28 (4-5): 219-224.
Related links and previous case studies:
Previous study on Water Scarcity - Its Measurement and Implications for Virtual Water Import, supported by Swiss National Science Foundation and EAWAG
Partners:
Eawag, IIASA

Project funded By:
GEO-BENE

Attachment	Size
GEPIC.pdf	705.11 KB
GEPIC_China.pdf	594.34 KB

»
Managing the Great Barrier Reef: the value of GEO information

EMail:
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Name:
jetske bouma
status:
started
Area:
Water
Sub-Area:
Coral reefs, marine resources
When will Benefits materialize?:
present and future
Date of Project:
september 2007- september 2008
Cross Benefit Areas:
Ecosystems, biodiversity
Observational Requirements:
RMS information from CSIRO (Australia) regarding coral reef quality, sea water quality, sediments etc.
Benefit baseline:
Probably the baseline will 1995 or 2000 and we'll ask policy makers and experts to compare this baseline with the present and with future possibilities
Is this a literature study?:
no
Expected Improvement of EO :
lower monitoring costs, more effective coral reef management, targetted changes in agricultural land use, etc.
Qualitative:
more efective management,
Quantitative:
we will try to quantify the value of information
Benefit Pathway:
direct (monitoring costs, targeting of interventions) and indirect (more effective management, higher ecological and recreational value, etc.)
Type of benefit assessment/illustration:
Expert judgement and stakeholder survey. We'll be using a questionnaire based on Bayesian decision Theory to estimate the added value of information for coral reef management. We will try to scale up the results for coral reef management in general, using the Great Barrier Reef as the reference scenarios.
Study Area:
Australia
Literature & Other Sources:
Mumby and Edwards (2002)Mapping marine environments with IKONOS imagery: enhanced spatial resolution can deliver greater thematic accuracy, Remote Sensing of Environment 82 (2002) 248–257
IGOS coral reef sub-theme report (2003) Constanza (1999) the ecological, economic and social importance of the oceans, Ecological Economics 31: 199-213
Project funded By:
GeoBene
Partners:

IVM, CSIRO
Related links and previous case studies:
North sea case study
»
Evolution of the oxygen content in the world ocean
EMail:
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Name:
Elena Moltchanova
status:
advanced
Area:
Water
Sub-Area:
Oceanography
Date of Project:
2006 - 2008
Cross Benefit Areas:
Climate
Observational Requirements:
Geo-referenced ocean oxygen content measurements.
Is this a literature study?:
n
Study Area:
global
Literature & Other Sources:
Min D-H, Keller K. Errors in estimated temporal tracer trends due to changes in the historical observation network: A case study of oxygen trends in the Southern Ocean. Ocean and Polar Research 2005;27(2):189-195. Bretherton FP, Davis RE, Fandry CB. A technique for the objective analysis and design of oceanographic experiments applied to MODE-73. Deep-Sea Research 1976;23:559-582
Partners:
KTL + Penn. State University (USA)
Project funded By:
EU + outside sources
»
Weather
Using Real Options to Time a Satellite Mission
EMail:
fuss@iiasa.ac.at
Name:
Sabine Fuss, Jana Szolgayova
status:
finished
Area:
Weather
Sub-Area:
-
When will Benefits materialize?:
benefits materialize as better/more observations enable a reduction in the damages arising from disasters
Date of Project:
5/2007-12/2007
Cross Benefit Areas:
Disasters
Observational Requirements:
The analysis is too abstract/aggregate to distinuish between different levels of resolution; or, in other words, different extents of damages could probably be avoided at all levels if such data could be made available.

Benefit baseline:

without observation/no damage reduction

Is this a literature study?:

n

Expected Improvement of EO :

portion of damages from disasters that can be avoided or mitigated because of better informed rescue missions, more exact and timely weather forecasts and thus improved warning systems, etc.

Auxillary Data Used:

The analysis is motivated by data on economic losses from disaster incidents from OECD Information Technology Outlook 2006, whereas all results are derived analytically. Numerical results are calculated with the cost data for the Galileo Programme and the avoided damages estimated from the OECD Information Technology Outlook.

Qualitative:

Uncertainty about benefits (avoided/mitigated damages) leads to later satellite launch, so that important EO can't be gathered in the meantime. Other factors: lifetime, scale economies, hosted payload

Quantitative:

Quantitative results of this study are to be taken as indicative/suggestive, since the magnitudes depend critically on the assumption of the portion of damages that can be avoided/mitigated.

Benefit Pathway:

indirect: a fraction of the damages resulting from disasters can be avoided or mitigated as a response to better informed rescue missions, more accurate weather forecasts etc

Type of benefit assessment/illustration:

A real options model is used to asses the optimal timing of investment into a satellite project and it enables us to derive the value of earth observations used to reduce the extent of the damages and consequences from severe weather events. The optimal timing is derived analytically following the procedure presented in Dixit and Pindyck (1994) under the assumption that avoided losses are equal to a fixed proportion of all damages suffered under the events that are modelled as a geometric Brownian motion. As a baseline a single satellite project is considered. The framework is further expanded to consider also a possibility of hosted payload capturing the feature of economics of scale. The optimal decision of the investor is then derived (into which project and at which time to invest) analytically.

Assumptions:

Using real options to derive the optimal timing of the satellite launch enables us to derive the value of information when it can be used to reduce the extent of the damages from disasters and their consequences. Improving weather information, forecasting and warning will deliver benefits in almost all economic sectors and society. Severe weather events – hurricanes, flash floods, and poor air quality episodes – impact every person and nation. The value of additional information from a satellite mission for disaster mitigation is represented by the ability to reduce the amount of losses suffered. Note that in contrast to models where the value of information is derived by comparing decisions taken when facing stochasticity to those taken under certainty, the framework used in this study takes on a different approach, since we do not assume that the occurrence of high-impact disasters can be avoided most of the time.

Gap Analysis:

-

Comments/Discussion:

final version of paper accepted at Space Policy for November 2008 issue under title "A Real Options Approach to Satellite Mission Planning"

Study Area:

data used are for OECD region

Literature & Other Sources:

[1] Harris R, Browning, R. Global monitoring for environment and security: Data policy considerations. Space Policy 2003; 19:265-76. [2] Dixit A, Pindyck R. Investment under Uncertainty. Princeton: University Press; 1994. [3] Organisation for Economic Cooperation and Development. Information and Communications Technologies – OECD Information Technology Outlook 2006. [4] Macauley MK. The value of information: Measuring the contribution of space-derived earth science data to resource management. Space Policy 2006: 274–82. [5] Peck SC, Teisberg TJ. Global warming uncertainties and the value of information: An analysis using CETA. Resour Energy Econ 1993; 15:71–97. [6] Nordhaus WD, Popp D. What is the value of scientific knowledge? An application to global warming using the price model.

The Energy Journal 1997; 18:1-45. [7] Fuss S, Johansson D, Szolgayova J, Obersteiner M. Impact of climate policy uncertainty on the adoption of electricity generating technologies. Working Paper 2008; International Institute of Systems Analysis. [8] Lave L, Apt, J. Planning for natural disasters in a stochastic world. J Risk Uncertainty 2006. 33:117-130. [9] Khabarov N, Moltchanova E, Obersteiner M. Valuing weather observation systems for forest fire management. Working Paper 2008; International Institute of Systems Analysis. [10] Moltchanova E, Khabarov N, Obersteiner M. Value of observations for building efficient earthquake rapid response system. Working Paper 2008, International Institute of Systems Analysis. [11] PricewaterhouseCoopers. Inception study to support the development of a business plan for the GALILEO programme. Tech. Rep. 2001, TREN/B5/23-2001.

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