

Joint Expert workshop on approaches to Remote Sensing for Vegetation Biomass Estimation

Brisbane, Australia.
February 24-26, 2015
with an optional field day, 27 February

Programme



Co-Hosted by:
GOFC-GOLD Land Cover Project Office and the Ad-hoc Biomass Working Group
The Global Forest Observations Initiative
CSIRO
Terrestrial Ecosystem Research Network of Australia

Background

Vegetation biomass is a crucial ecological variable and an important component of the global carbon budget. Improved understanding of the magnitude, condition, seasonal-, and inter-annual dynamics of global biomass stocks will improve key quantitative assessments of the impacts of natural-, or human-induced alterations of the global carbon cycle. Accurate estimation of standing biomass dynamics across the landscape is also critical for researchers, national governments, NGO's, regional agencies and the private sector keen to use such data for effective natural resource management, assessment of crop biomass, bio-fuels, bushfire-fuel or pasture biomass for animal feed.

Many institutions and countries are actively investing in-, and exploring approaches for more operationally integrating conventional ground measurements of biomass, and scaling these to broader regions with the aid of remote-sensing and models. While the choice of methodologies being evaluated at present depends upon a number of factors, including purpose of the data, density of available ground data, allometrics data, access to relevant remote sensing data and technologies, capacities and resources, and the potentials and limitations of various measurements and monitoring approaches, there are so far no widely accepted wide-area biomass measurement methods agreed-upon yet, that provide the necessary cost-effectiveness and routine mapping certainty at "policy and management-relevant" scales, for use by governments, researchers and the private sector at sub-national, national and global scales.

Workshop objectives

The main workshop goals are therefore: (1) to discuss science and technical details and showcase current methods for remote sensing-based estimation of vegetation biomass, across multiple land-use types, at sub-national, national and global scales, (2) to evaluate the current levels of uncertainty against conventional in-situ measurements and models, as well as (3) their level of "operational applicability and robustness" for routine use by institutional or governments users.

This is highlighted as one of most important R&D priorities in GFOI (see <http://gfoi.org/rdand>), and also via the establishment of an expert working group on Biomass sensing (http://www.gofc-gold.uni-jena.de/wg_biomass/sites/background.php), that has met a number of times to address this topic.

There is an increasing amount of knowledge and experience from different organisations, scientists and expert teams that are investigating different approaches to estimate standing biomass and its dynamics, e.g. via combinations of in-situ data, remote sensing and model integration. The workshop therefore aims to bring together key representatives of these organisations and expert teams, as well as selected end-users, to discuss the evolving needs and current state-of-the-art on biomass estimation, and importantly, identify gaps and obstacles that hinder progress and more operational implementation of these approaches.

More specifically, the workshop aims to:

- Present and share experiences on different types of methods for estimation of biomass at multiple scales and land-cover types, via integration of earth observations (SAR, lidar, optical), ground-based surveys, and models.
- Assess the evolving needs from the international level for synoptic, wall-to-wall biomass dynamics data.
- Assess current efforts and methods into ground-based measurement of biomass, as well as data availability for use in e.g. validation of integrated wide-area biomass maps
- Discuss important gaps and obstacles and opportunities for future improvements documented in an action plan for further R&D and demonstration activities,

The workshop is aimed for three days and includes presentations and working group sessions and plenary discussions to achieve the objectives.

Workshop Outputs: A key output from the workshop will be a synthesis report on latest methodologies, as well as guidance and an action plan towards opportunistic and dedicated routine satellite data acquisitions, and improvement of the underlying science and national biomass monitoring systems for organisations and countries.

Organisers

Global Observation of Forest and Land Cover Dynamics (GOFC-GOLD, www.gofcgold.wur.nl): is a coordinated international effort to ensure a continuous program of space-based and in situ forest and land cover observations to better understand global change, to support international assessments and environmental treaties and to contribute to natural resources management. GOFC-GOLD encourages countries to increase their ability to measure and track forest and land cover dynamics by promoting and supporting participation on implementation teams and in regional networks. Through these forums, data users and providers share information to improve understanding of user requirements and product quality. GOFC-GOLD is a panel of the Global Terrestrial Observing System (GTOS), sponsored by FAO, UNESCO, WMO, ICSU and UNEP. More specifically the primary function of the Land Cover Implementation Team (LC-IT) is to develop and evaluate methods, tools and products for land cover measurements and monitoring using space-borne and in-situ observations. The LC-IT assesses current needs and deficiencies for global and regional monitoring to support Global Change research, national and regional forest inventories and international policy (i.e. through working with the UN Conventions). The LC-IT cooperates with the GOFC-GOLD Fire-IT, WGs, and worldwide RNs.

Global Forest Observations Initiative (GFOI, <http://www.gfoi.org/>) is an initiative of the inter-governmental Group on Earth Observations (GEO) that aims to: foster the sustained availability of observations for national forest monitoring systems; support governments that are establishing national systems by providing a platform for coordinating observations; providing assistance and guidance on utilising observations, developing accepted methods and protocols and promoting on-going research and development; and work with national governments that report into international forest assessments and the national greenhouse gas inventories reported to the UNFCCC using methods of the IPCC. Following the GFOI expert workshops on sensor interoperability (Woods Hole, USA, June 2014) and forest degradation (Wageningen, NL, Oct 2014) this is the third in a series of technical expert workshops organised as a part of the GFOI R&D Plan.

CSIRO (www.csiro.au) is Australia's national science agency.

Terrestrial Ecosystem Research Network (Australia) (TERN – www.tern.org.au) provides critical research infrastructure, satellite- and ground data, and supporting national and international networks of scientists, environmental managers and stakeholders, needed to improve understanding and management of Australia's ecosystems.

Organising Committee Leads:

GOFC-GOLD Land Cover Project Office and Wageningen University: Martin Herold and Brice Mora

Global Forest Observations Initiative: Ake Rosenqvist and Anthea Mitchell

Terrestrial Ecosystem Research Network (Australia): Alex Held, Stuart Phinn, Randall Donohue, Peter Scarth.

CSIRO: Alex Held, Randall Donohue.

DAY 1 Tuesday, February 24, 2015

0830 – 0900	Registration	
Introduction & Workshop Context		
0900 – 1015	Welcome and housekeeping	Stuart Phinn (UQ)
	The GFOI R&D component, Priority R&D topics and end-user requirements	Ake Rosenqvist (soloEO), Anthea Mitchell (Uni NSW)
	GOFC-GOLD Biomass WG	Christiane Schmulilius (GOFC-GOLD & Uni Jena)
	TERN AusCover status and activities	Alex Held (CSIRO/TERN)
Biomass Information End-Users and Requirements		Chair: Brice Mora (Wageningen Uni)
1015 – 1130	GEOGLAM Rangelands	Mike Grundy (CSIRO)
1030 – 1100	Morning break	
	Biomass data for carbon accounting – an Australian perspective	Shanti Reddy (DotE)
Methodology Showcase 1		Chair: Crystal Schaaf (Uni Massachusetts)
1130 – 1230	New generation data integration approaches for land-sector carbon accounting	Rob Waterworth (ANU)
	C-Store – a remote-sensing and observation-driven carbon assessment system	Randall Donohue (CSIRO)
	COUNTRY REPORT - Brazil: Integrating remote sensing and process-based modeling in regional assessments of biomass and soil carbon	Marcelo Galdos (CTBE, Brazil)
1230 – 1330	Lunch break	
Methodology Showcase 2		Chair: Ake Rosenqvist (soloEO)
1330 – 1430	National carbon stock assessment for REDD+ in Guyana	Pete Watt (Winrock)
	**Australia’s National Biomass Mapping Project – updates from the UQ JRSRP and JAXA K&C Initiative	Richard Lucas (Uni NSW) Peter Scarth & John Armston (UQ/DSITIA)
	UNREDD	Andrew Haywood (UNREDD)
1430 – 1500	Afternoon break	
Working Group 1 – Synthesis of drivers for biomass information		Moderator: Stuart Phinn (Uni Qld)
1500 – 1700	Synthesise the current and future needs for biomass information - For what purposes is biomass information needed? - What data types and data specs are required for these purposes?	
1700 - 1730	Recap of the day	Peter Scarth (UQ/DSITIA)
1900 – late	Joint dinner (no-host)	

DAY 2 Wednesday, February 25, 2015

Methodology Showcase 3		Chair: Ake Rosenqvist (soloEO)
0900 – 1030	Compact Biomass Lidar (CBL) deployments in a range of ecosystems (and in tandem with the DWEL)	Crystal Schaaf (U Mass)
	Dual-Wavelength Echidna Lidar	Michael Schaefer (UNE & TERN)
	Methods and guidance relating to biomass assessments and monitoring	Carly Green (Environmental Accounting Services)
	Geo-Wiki and International Forest Biomass Network (IFBN) – global repository of biomass data	Dmitry Schepaschenko (IIASA)
1030 – 1100	Morning break	
Methodology Showcase 4		Chair: Anthea Mitchell (Uni NSW)
1100 - 1230	Pasture biomass sensing – from the ground up	David Lamb (UNE)
	GlobBiomass, Forest Dragon and EuRuCAS – synergy of ESA and EC projects	Christiane Schmullius (GOFC-GOLD & Uni Jena)
	African above and below ground savannah biomass	Bob Scholes (CSIR South Africa)
	<i>COUNTRY REPORT</i> : Reference level estimation in Nepal integrating LiDAR, satellite and field plots	Basanta Gautam (Arbonaut)
1230 – 1330	Lunch break	
Working Group 2 – Methods and guidelines		Moderator: Rob Waterworth (ANU)
1330 – 1530	Provide recommendations on methods and guidelines for setting up national-scale biomass monitoring systems - Data and infrastructure requirements - Summary of latest RS, scaling and model-data integration methodologies and their operational status - Updates to methodological guidance are required (GFOI MGD and GOFC-GOLD Sourcebook)	
1530 – 1600	Afternoon break	
1600 – 1730	Report back from working group sessions 1 and 2	Stuart Phinn
1900 – late	Joint dinner (no-host)	

DAY 3 Thursday, February 26, 2015

Mission and data update		Chair: Yves Crevier (CSA)
0900 – 1030	Advances in forest biomass inventory from air and space	Sassan Saatchi (NASA) – <i>remote presentation</i>
	MOLI or GEDI (Japan and US LiDARs on ISS)	Ake TBC
	P-band BIOMASS mission	Frank Martin Seifert (ESA)
	Geo-Wiki and International Forest Biomass Network (IFBN) – global repository of biomass data	Dmitry Schepaschenko (IIASA)
1030 – 1100	Morning break	
Working Group 3 – Obstacles, opportunities and research priorities		Moderator: Randall Donohue (CSIRO)
1100 - 1230	Identify the obstacles to implementation and the R&D and funding priorities <ul style="list-style-type: none"> - Identification of obstacles to operational EO-based biomass estimation (e.g. methodological obstacles; RS data gaps, etc) - Coordinating biomass observations, allometrics & study sites (tbd) - What are the priority R&D and collaboration needs? - On which field sites should efforts be focussed? - What new funding, data access and schedules will be required? 	
1230 – 1330	Lunch break	
1330 – 1430	Report back from working group session 3	Alex Held
Concluding discussions and meeting summary		Christiane Schnullius / Ake Rosenqvist / Alex Held
1430 – 1600	At the conclusion of the workshop it is anticipated the following outcomes will be met: <ul style="list-style-type: none"> - Identification of promising approaches/technologies to biomass eg. for REDD+ - A action plan to progress these methods to pre-op/op status - and possible future inclusion in MGD and Sourcebook - Selected test sites and research partners for coordinated trials Input/recommendations to CEOS SDCG strategy for R&D 	
1600	Close of meeting	

DAY 4 Friday, February 27, 2015

An optional field visit to the Karawatha SuperSite and the Brisbane Botanic Gardens.



The Karawatha SuperSite is a long-term ecological research site in Eucalypt forest at Karawatha Forest Park in Brisbane. Karawatha Forest is on the southern peri-urban edge of Brisbane and is managed by the Brisbane City Council. It contains a variety of habitats from freshwater lagoons and sandstone ridges, to dry eucalypt forests and wet heath. See <http://www.tern-supersites.net.au/index.php?id=18>.

At Karawatha we will be hearing about the biomass-oriented monitoring activities being conducted at the supersite, hear of some of the major issues associated with modelling the carbon stocks of these forests, and have a demonstration of the latest in ground-based Lidar technology. There will be some easy, short (15min) track-based walking through the site.



Transport, sunscreen, morning and afternoon tea, drinks and a BBQ lunch will be provided. Covered shoes and a sun hat will be required, and you might benefit from a raincoat (weather depending).

At the Botanic Gardens we plan to have a discussion of the Queensland biomass assessment activities. We may even get up close with some wildlife!

We will be back in Brisbane CBD by 4 pm.

FURTHER INFORMATION

Venue

Customs House, Brisbane, Australia (details <http://www.customshouse.com.au/>)

Time and weather

Brisbane is on Australian Eastern Standard Time, which is GMT +10.

The average minimum and maximum daily temperatures for February are 20 and 30 °C, with an average February rainfall of 160 mm/yr spread across 8 days. In other words, it's lovely!

Suggested Hotels near venue:

- Oaks Aurora Tower (<http://www.oakshotelsresorts.com/oaks-aurora/>)
- Rendezvous Hotel Brisbane Anzac Square (<https://www.tfehotels.com/brands/rendezvous-hotels/rendezvous-hotel-brisbane-anzac-square>)
- Marriott (<http://www.marriott.com/hotels/travel/bnedt-brisbane-marriott-hotel/>)
- Mantra (<http://www.mantra.com.au/queensland/brisbane-and-surrounds/brisbane/accommodation/hotels/mantra-on-the-quay/>)

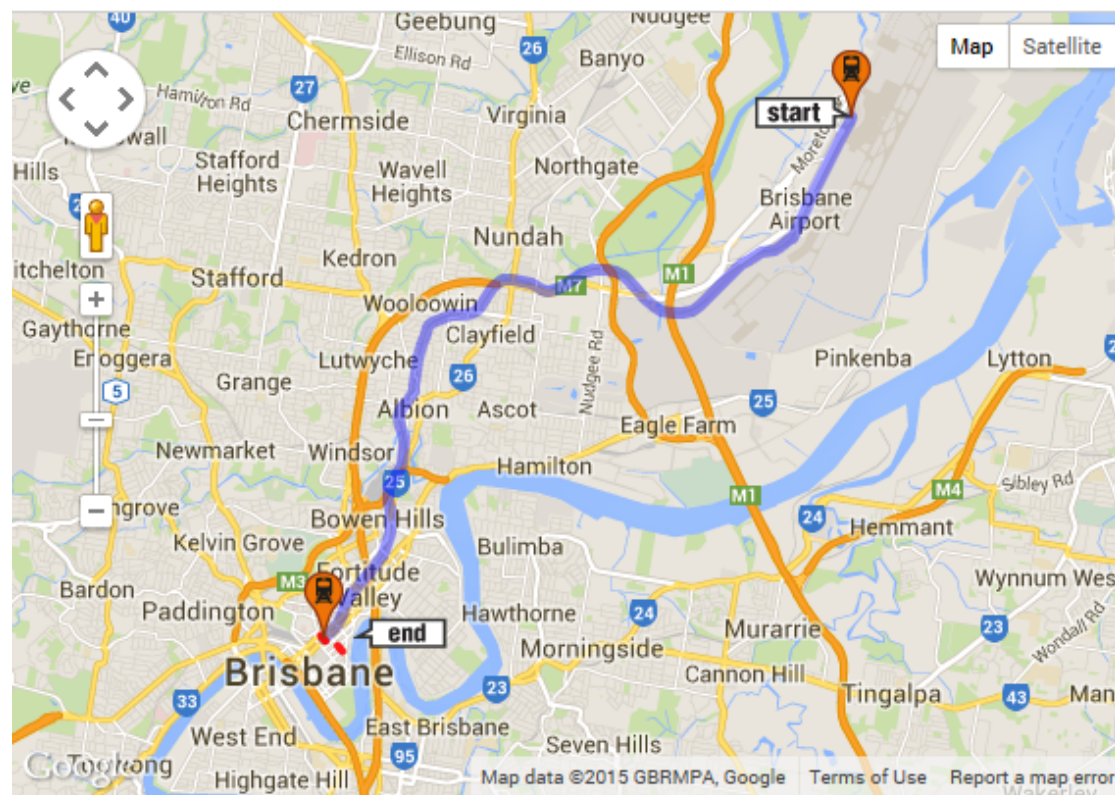
For other hotel options and local Brisbane and state of Queensland tourism options, visit: http://www.queenslandholidays.com.au/destinations/brisbane/brisbane_home.cfm

Transport from the airport

The best two options for getting to from Brisbane airport to Customs House are either:

1. Train then walk. Catch the Airport via Brisbane City to Beenleigh train (BDBN) [This train can be caught from both the Domestic and International Airports). See Map 1 below. There is only one train line and it is well sign-posted at both airports to this single line. The trip takes about ½ hour to the City. Passengers would need to hop off at Central Station. It is then a 1 km walk to Customs House. See Map 2 below). Tickets can be bought on line or at the Station with cash or credit card.
2. Cab/Taxi – about half hour \$50-\$60

Map 1. Train trip from either the Domestic or International airports into Brisbane City (hop off at Central Station)



[reset map to full journey](#)

Map legend

■ walk ■ transit

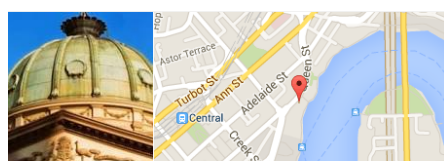
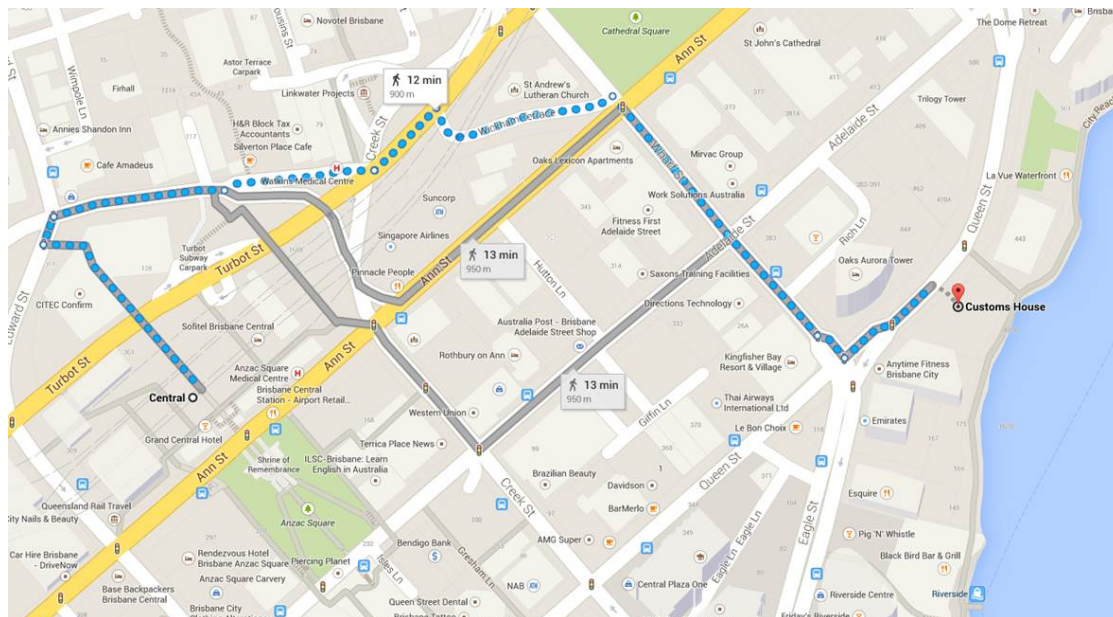
Fare information

This is an Airtrain journey. [About Airtrain fares](#)

Ticket type	Price
go card adult	\$17.00
	\$17.00 (off-peak)
go card concession	\$17.00
	\$17.00 (off-peak)
Single paper adult	\$17.00
Single paper concession	\$17.00

i A [taxi service](#) may be available for your journey.

Map 2. Walking path from Central Station to Customs House



Customs House, Brisbane

Building in Brisbane, Queensland

[Directions](#)

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Customs House is a heritage-listed customs house located on Queen Street by the Brisbane River in Brisbane, Queensland, Australia.
[Wikipedia](#)

Address: 399 Queen Street, Brisbane QLD 4001

Opened: 1889

Floors: 3

Phone: [\(07\) 3365 8999](tel:0733658999)

Hours: Open today · 9:00 am - 9:30 pm

Reviews

4.1 ★★★★★ 36 Google reviews

More reviews: [dimmi.com.au](#) [tripadvisor.com.my](#) [here.com](#) [tripadvisor.com.sg](#)

Contacts

For more information about workshop content and schedule, please contact

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For more information about workshop logistics (venue, accommodation), please contact

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