GOFC/GOLD RED (Reducing Emissions from Deforestation) Working Group

Established to provide technical input to UNFCCC discussions on reducing emissions from deforestation, particularly related to space-based observations.
## Ensure contribution through participation

<table>
<thead>
<tr>
<th>Event</th>
<th>Date Range</th>
<th>Details</th>
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<tbody>
<tr>
<td>GOFC-GOLD working group initiation</td>
<td>Jul '05</td>
<td>GTOS/GOFC report</td>
</tr>
<tr>
<td>1st GOFC-GOLD workshop</td>
<td>Dec '05</td>
<td>GTOS/GOFC report</td>
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<td>ED SBSTA side event</td>
<td>Feb/Mar '06</td>
<td>ED SBSTA side event</td>
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<td>GTOS submission I</td>
<td>May '06</td>
<td>GTOS/GOFC report</td>
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<td>COP11 Montreal</td>
<td>May '06</td>
<td>Subm. of view by parties I</td>
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<td>SBSTA 24</td>
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<tr>
<td>COP12 Nairobi</td>
<td>Aug '06</td>
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<tr>
<td>COP13 Bali</td>
<td>Nov '06</td>
<td>Subm. of view by parties II</td>
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<td>SBSTA 26</td>
<td>Nov '06</td>
<td>2nd SBSTA workshop</td>
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<td>2nd GOFC-GOLD workshop</td>
<td>Nov '06</td>
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<td>GTOS submission II</td>
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<td>GTOS/GOFC technical guideline</td>
<td>Dec '06</td>
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<td>3rd SBSTA workshop</td>
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### Topics
- Scientific and methodological issues
- Policy options and incentives
- Post 2012 implementation?
Bottom Line Conclusions from Jena Workshop

- Various methods are available and appropriate to measure change in forest cover at national level
  - *Caveat: constraint of access to high resolution data and national capacity for analysis*
  - *National examples exist*
- Forest degradation important but more challenging
- Carbon stock estimates and approaches to estimate emissions more uncertain but existing IPCC guidelines can be applied
- Interannual variability of deforestation high: challenge for reference period
Global observations

- MODIS-type sensors
  - Deforestation (~10-20 ha)
  - (intra-) annual
  - Hot spots of forest change

Hot spot/large deforestation detection

Wall-to-wall mapping

National/local observations

- Landsat-type sensors
  - Deforestation (~0.5-1 ha)
  - Inter-annual (5 – 10 years)
  - Regionally-tuned forest degradation mapping

Landsat-type sensors

Sampling approach

Change in forest area and density

Fine-scale/in-situ observations

- Nat./Reg. forest inventories
- In-situ/plot data
- Targeted remote surveys
- IPCC-LULUCF / AFOLU

Estimation of carbon emissions

GOFC-GOLD
<table>
<thead>
<tr>
<th>CAPABILITY</th>
<th>CURRENT LIMITING FACTOR</th>
<th>STATUS OF SCIENCE TO OPERATION TRANSITION</th>
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<tbody>
<tr>
<td>Deforestation/ degradation area</td>
<td>High resolution data cost and access; national capacity</td>
<td>Potentially operational</td>
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<tr>
<td>Carbon stocks</td>
<td>RS/ground data methods; radar/lidar data availability</td>
<td>Need methods development</td>
</tr>
<tr>
<td>Emissions estimates</td>
<td>Accepted approaches</td>
<td>Need science development</td>
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</table>
What do we need to achieve here?

• **Learn from case studies**
  – Are there common impediments to estimating emissions?
  – Are case study approaches transferable across countries?

• **Address unresolved issues**
  – What is degradation and how to monitor
  – Methods for estimating carbon emissions
  – Approaches for reference period

• **Plan the way forward**
  – Manual for estimating emissions from deforestation
  – Publication on case studies
  – Participation in UNFCCC process
Workshop organization

• Tuesday
  – Recent developments and policy updates
  – Ongoing activities and case studies

• Wednesday
  – Break-out groups
  – Data access and methodologies

• Thursday
  – Break out groups and writing
  – Plans to move forward
### Various approaches to estimating carbon emissions from deforestation

<table>
<thead>
<tr>
<th>Source</th>
<th>1980's (PgC/yr)</th>
<th>1990's (PgC/yr)</th>
<th>Spatial coverage</th>
<th>Method for area</th>
<th>Method for carbon flux</th>
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</thead>
<tbody>
<tr>
<td>Houghton (2003)</td>
<td>2.0</td>
<td>2.2</td>
<td>Global, 9 regions</td>
<td>FAO and inventories</td>
<td>Bookkeeping</td>
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<td>Fearnside (2000)</td>
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<td>Pan-tropic, 6 regions</td>
<td>FAO and inventories</td>
<td>Bookkeeping</td>
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<td>McGuire et al (2001)</td>
<td>0.9-1.6</td>
<td>-</td>
<td>Global</td>
<td>Cropland change</td>
<td>Ecosystem models</td>
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<tr>
<td>DeFries et al (2002)</td>
<td>0.6 (0.3-0.8)</td>
<td>0.9 (0.5-1.4)</td>
<td>Pan-tropics</td>
<td>AVHRR</td>
<td>Bookkeeping</td>
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<tr>
<td>Achard et al (2004)</td>
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<td>1.1 ± 0.3</td>
<td>Pan-tropics, sample</td>
<td>Landsat</td>
<td>Bookkeeping</td>
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<td>Houghton et al (2000)</td>
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<td>0.2</td>
<td>Amazon</td>
<td>Landsat-derived</td>
<td>Bookkeeping</td>
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<td>Fearnside (1997)</td>
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<td>0.261</td>
<td>Brazilian Amazon</td>
<td>Landsat-derived</td>
<td>Bookkeeping, committed flux</td>
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<td>Potter et al (2001)</td>
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<td>0.2-1.2</td>
<td>Legal Amazon</td>
<td>Satellite-derived fire</td>
<td>Fire emission and ecosystem model, gross flux</td>
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</table>
Reducing emissions from deforestation

• EU council (20.Feb.07) - elements as essential parts of an effective and appropriate post Kyoto framework:
  - Reducing emissions from deforestation and reverse them within the next two to three decades
  - Maximizing co-benefits with biodiversity protection and sustainable development (CBD, CCD)

• EU submission to SBSTA (23.Feb. 07):
  - it is very likely that both remote sensing and ground-based data will be needed
  - By 2012 activities to improve the monitoring and reporting capacity required

• GOFC-GOLD working group (2 GTOS submissions to SBSTA):
  - Satellite monitoring is the only objective approach in developing countries
  - Forest changes can be monitored with confidence for assessing and comparing historical and future rates of deforestation
  - Consensus technical guidance on current and future EO capabilities for monitoring deforestation
Reducing Greenhouse Gas Emissions from Deforestation in Developing Countries: Considerations for Monitoring and Measuring

- **Executive summary**
  - Common statements on technical feasibility
- **Context from agenda item 6 of COP-11**
- **Monitoring deforested area**
  - Can be done with confidence, variety of methods
- **Monitoring degraded forest area**
  - Important, more challenging
- **Monitoring carbon stock changes**
  - Already established in IPCC + remote sensing
- **Estimating emissions**
  - Area x carbon stock change

August 2006
www.fao.org/gtos/pubs.html
17-19. April 2007 - 2nd GOFC-GOLD REDD workshop:
“Measuring and monitoring greenhouse gas emissions from deforestation in developing countries: from case studies to implementation guidelines”

Objectives:
- Coordinate recent and ongoing case studies on the REDD issue and discuss and synthesize their practical experiences
- Discuss specifically key challenging issues
- Organize the development of methodological guidelines towards a detailed technical protocol for measuring and monitoring including ‘reliability’ assessments
- Formulate technical and methodological recommendations for implementation at regional and national scales