

GGOS and GEO: How to Improve the Contributions and Results?

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- Review of Work Plan
- Alternatives for GGOS contributions to GEO
- Proposal

GEO Work Plan 2009-2011: Relevance of Geodesy

Based on 42 Tasks (many with several sub-Tasks):

5 Architecture Tasks

4 Data Management Tasks

5 Capacity Building Tasks

2 Science and Technology Tasks

3 User Engagement Tasks

4 Disaster Tasks

3 Health Tasks

3 Energy Tasks

3 Climate Tasks

3 Water Tasks

2 Weather Tasks

2 Ecosystems Tasks

2 Agriculture Tasks

1 Biodiversity

Overarching Tasks

SBA-specific Tasks

GEO Work Plan 2009-2011: Relevance of Geodesy

AR-09-01: GEOSS Common Infrastructure

- a) Enabling Deployment of a GEOSS Architecture: “... register related resources with GEOSS”: *register GGOS and IAG Services*
- b) GEOSS Architecture Implementation Pilot: *many opportunities to participate in interoperability studies and pilots*
- c) GEOSS Best Practices Registry: *register ITRF, georeferencing, height, gravitational potential*
- d) Ontology and Taxonomy Development: *geodetic ontology*

AR-09-02: Interoperable systems for GEOSS

- a) Virtual Constellations: *work towards geodetic virtual constellations, Earth's shape and gravity field, for geohazards, water cycle ...*

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AR-09-03: Advocating for Sustained Observing Systems: *demonstrate the role of GGOS as a “GEOSS-underpinning observing system and propose a sub-Task for GGOS. Formal recognition of GGOS through UNESCO would support this.*

AR-09-04: Dissemination and Distribution Networks

a) GEONETCast

b) GEONET

Both sub-Task could be of interest for distribution of real-time and low-latency products (e.g. station displacements) to users; could be complementary to Ntrip or the NASA Datastream.

AR-06-11: Radio Frequency Protection: *could be of interest for the protection of VLBI frequencies.*

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DA-09-01: Data Management

b) Data, Metadata and Products Harmonisation: *common reference frame is an issue,*

DA-09-02: Data Integration and Analysis

c) Global Geodetic Reference Frames: *utilize the task to inform other GEO-Tasks*

DA-09-03: Global Data Sets

d) Global DEM: “... should be embedded into a consistent, high accuracy, and long-term stable geodetic reference frame for Earth observations”: *we need to ensure that this reference frame is ITRF; also needed is a geoid model with same resolution.*

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CB-09-01: Resource Mobilization

CB-09-02: Building Individual Capacity in Earth Observations

CB-09-03: Building Institutional Capacity in Use of Earth Observations

CB-09-04: Capacity Building Needs and Gap Assessment

CB-09-05: Infrastructure Development and Technology Transfer for Information Access

Several activities which potentially could help to build capacity in geodesy in developing countries. Opportunities for regional organizations, such as AFREF to participate.

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ST-09-01: Catalyzing Research and Development (R&D)

Funding for GEOSS: *highly relevant for funding of geodetic contribution; IAG should be participating in the Task.*

ST-09-02: Promoting Awareness and Benefits of GEO in the Science and Technology Community: *This is a two-way task:*

promoting GEOSS in the science community and bringing this community into GEO/GEOSS. Of interest for IAG/GGOS. IAG should consider to co-lead.

US-09-01: User Engagement:

a) Identifying Synergies between SBAs

b) Communities of Practice and Partnership Development:

Both important for GGOS as a link and outreach to users in several SBAs.

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DI-06-09: Use of Satellites for Risk Management: “... constellation requirement definition ...”: *could be a way to promote geodetic satellites.*

DI-09-01: Systematic Monitoring for Geohazards Risk Assessment:

a) Vulnerability Mapping and Risk Assessment; includes the “supersite” initiative: *data from the global geodetic networks is highly relevant; UNAVCO is involved and could help to bring in GGOS.*

b) Seismographic Networks Improvements and Coordination; “Improve the capability of ... GNSS networks ...”: *UNAVCO, NASA, and IGS real-time products are highly relevant and should be reported; networks could be coordinated with seismic networks.*

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DI-09-02: Multi-Risk Management and Regional Applications

b) Regional End-to-End Disaster Management Applications:
potential for GNSS meteorology.

DI-09-03: Warning Systems for Disasters:

a) Tsunami Early Warning System of Systems: *geodesy is central; contributions should be flagged as GGOS contributions where possible.*

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EN-07-01: Management of Energy Sources

EN-07-02: Energy Environmental Impact Monitoring

For both tasks, georeferencing is important. For impact, subsidence is relevant.

CL-06-01: A Climate Record for Assessing Variability and Change

a) Sustained reprocessing and reanalysis of climate data:
dedicated reanalysis of GNSS, satellite altimetry, satellite gravity missions to improve the climate record

c) Key Climate Data from Satellite Systems: *satellite altimetry, satellite gravity missions, ...*

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WA-06-02: Droughts, Floods, and Water Resource Management

- a) Forecasting for Droughts and Floods: *teleconnections: satellite altimetry and satellite gravity missions.*
- b) Impacts from Droughts: *soil moisture and groundwater changes from geodetic observations.*

WA-06-07: Capacity Building for Water Resource Management

- b) Africa: *focus of the IGCP 565 Project.*

WA-08-01: Integrated Products for Water Resource Management and Research

- a) Soil moisture
- c) Groundwater
- d) Precipitation
- e) Water Cycle Data Integration

For all of these areas, geodetic observations are relevant and should be promoted.

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WE-06-03: TIGGE and the Development of a Global Interactive Forecast System for Weather.

WE-09-01: Capacity Building for High-Impact Weather Prediction.

Both task might benefit from GNSS troposphere products.

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EC-09-01: Ecosystem Observation and Monitoring Network (GEO EcoNet)

b) Ecosystem Status and Trends: *Perhaps Hydrology mapping through satellite gravity field?*

EC-09-02: Ecosystem Vulnerability to Global Change

a) Impact of Tourism on Environmental and Socio-Economic Activities: *Monitoring of sea level rise (e.g. the Mediterranean); reference frame, altimetry, GPS positioning of tide gauges; Use of satellite derived gravity field to observe changes in hydrology conditions;*

c) Vulnerability of Sea Basins: *Monitoring of sea level rise (e.g. the Black Sea); reference frame, altimetry, GPS positioning of tide gauges; Monitoring of coastline subsidence with GPS.*

d) Vulnerability of Mountain Regions: *Monitor Ice volume with altimetry (like ICESat)? Canopy Monitoring (Like VCL)?*

GEO Work Plan 2009-2011: Relevance of Geodesy

BI-07-01: Developing a Global Biodiversity Observation Network

a) Biodiversity Observation Network: *Sea level (reference frame and altimetry) and hydrology (gravity field). Canopy monitoring (VCL). We have the ability to monitor changes in height – subsidence should be important for some ecosystems like the Everglades and New Orleans.*

Alternatives for GGOS Contribution to GEO

- Business as usual: low ratio of measurable results to effort
- Increased contribution at Task and/or CoPs Levels (horizontal alternative): can be at the research/science level, requires considerable individual efforts, no necessarily increasing visibility of GGOS
- Focus on one theme (vertical alternative): Visibility at all levels, likely measurable results
- Top-Level: Co-Chair(s) of Committee(s): highest impact on development of GEO and GEOSS; high visibility.

Independent of these alternatives:

- Registration of Services

Proposal

- Registration of Services: *relatively small effort;*
- Continuation of Task DA-09-02c: *but better promotion in the GEO Community and in other relevant Tasks;*
- Contribution to several, carefully selected Task;
- Increased participation in CoPs (CZCP, Geohazards, Water, Cryosphere, Energy?)
- One vertical Theme: Geohazards or Water
- At least one Co-Chair (STC?)