Temporary Foreword

The text in Roman type covers topics that need to be included in the version of the draft Framework presented to GEO-2. The precise text to be used will be refined and expanded through contributions from the five Subgroups.

The text in italics consists of explanation, comments and advice directed at the GEO Secretariat and/or the Subgroup Co-Chairs. As such, the italicised text will not, of course, figure in the final draft of the Framework that goes to GEO-2.

Please also note that the guidance contained in this document is intended to build upon and amplify that contained in the Terms of Reference provided to the GEO Subgroups.

Annotated draft FRAMEWORK OUTLINE

I. Introduction (to be completed by the Secretariat)

The GEO Secretariat will compile the Introduction with substantial inputs from the Subgroup Co-Chairs and members of the five GEO Subgroups. After the incorporation of comments from GEO members and participants, a draft Framework will be distributed in good time for consideration at GEO-2 scheduled to be held in Baveno, Italy on 28/29 November, 2003.

The Outline is intended to provide guidance to the Subgroups in their work (including interaction between Subgroups) and in the drafting of their contributions to the draft Framework. The draft Framework will form the basis for discussions at GEO-2 and to facilitate the production of the substantive Framework document to be submitted to the GEO meeting held in Tokyo in the second quarter of 2004.

The intention is that the Framework document as it emerges from the GEO meeting in Tokyo will be transformed into the 10-year Implementation Plan, scheduled to be considered by the GEO (*presumably just before the ministerial meeting to be arranged in Europe)* in the 4th quarter of 2004.

In preparing this document full account has been taken of the Declaration of the Earth Observation Summit and of the relevant discussions at GEO-1.

II. Purpose (to be completed by the Secretariat)

The purpose of the Framework is to describe the major elements and the general approach to achieving a comprehensive, coordinated, and sustainable Earth observation system or systems which can realistically be put into place within the next 10 years, making the maximum practicable use of, and where possible strengthening, existing contributory elements. The document also has to indicate clearly what decisions and actions are required of subsequent GEO meetings in order to allow a 10 year Implementation Plan to be presented in the 4th quarter of 2004, for adoption at the European Summit.

III. Benefits of the GEO Initiative

It is not necessary in the Framework to go into detail on the potential benefits from the development of a comprehensive, coordinated, and sustained Earth observation systems or systems. This GEO Initiative (suggested as a replacement for the term "IEOS"); GEO members and participants are presumably already convinced that the effort is justified. Outreach is needed, not "inreach".

There has been wide recognition of the considerable benefits that can be produced by international, comprehensive and sustained Earth observations and the transformation of these observations into products and services. The benefits will be not only in socio-economic terms, but also in relation to improving the understanding of the Earth system, providing support to decision-making processes, and, perhaps most significant of all, in supporting sustainable development.

It is important to note that some benefits would accrue even in the short-term, that is, as soon as there is a wider and regular exchange of Earth observation observations from *in situ,* aircraft and satellite networks, dedicated to the purposes enunciated in the Declaration, and available in a full and open manner with minimum time delay and minimum cost to the user. Provider and user agencies should be encouraged to work to identify products that could be derived from existing data and which would produce short-term benefits.

Sections IV through IX will be completed by contributions from the 5 Subgroups. Inevitably in such a multi-disciplinary exercise, there will be some overlapping of interests among the Subgroups. Attention will be drawn in the following sections to specific areas where consultation between two or more Subgroups appears to be critical, but in addition Subgroup Co-Chairs are in general invited to establish informal contacts with the Subgroup Co-Chairs of other Subgroups with a view to agreeing a sensible division of work. This informal horizontal consultation will continue to be important in the drafting of the substantive Framework document once the draft has been approved by GEO-2.

The development of the Framework document is not intended to be a significant amount of writing. It is envisioned to be a high-level, perhaps 15-20 page document. If time does not allow for the production of a full text, Subgroup Co-Chairs should feel free to use bullet headings, provided that their intent is clear. A more extended and detailed text will, of course, be required for the substantive Framework document to be submitted in the 2nd quarter of 2004.

IV. User Requirements

The GEO Initiative is intended to meet the needs and requirements of many science disciplines and useful applications, and to provide key information for decision-makers worldwide. It is clearly important, therefore, for the work in the next year to take full account of users' needs. It will be essential for these needs to be expressed by the users in terms of information needs, rather than by trying to consider how the requirements can be satisfied by the providers of observations or by existing data processing and distribution systems.

For the purpose of the draft Framework, the emphasis is placed on describing the existing inventories of user requirements and their present status. In particular, the CEOS/WMO database (including its latest update), the IGOS Partnership theme reports, the GCOS 2nd Adequacy Report, WCRP's requirements. Long-term data requirements should be considered as well. *(Those connected with these initiatives consider that collectively they may cover around 80-90% of major user requirements for Earth observation. However, other existing inventories should be considered as well. It would be valuable for the draft Framework to have a view on this from the User Requirements & Outreach Subgroup, and also to have a first list of the perceived gaps in the current overall inventory of user requirements. Input from the Users Requirements Subgroup will be critical for other Subgroups and it is therefore important for an early start that immediate use be made of existing data banks.)*

V. Outreach

A prominent part of the substantive Framework document will deal with outreach, and the need to promote a much wider awareness of the benefits of a comprehensive, coordinated and sustained Earth observation system or systems. This will be particularly –but by no means exclusively – of interest and value to developing countries. The maximum use should be made of existing outreach mechanisms, such as those conducted by members of the IGOS-P community, and a complementary programme will need to be developed to actively demonstrate the usefulness of Earth observations to key user communities at a decision-making level.

(*Although some reference to Outreach will need to be provided by the User Requirements and Outreach Subgroup for inclusion in the draft Framework, it is suggested that the detail should be reserved for the post-GEO-2 phase when the Framework will be developed. The Capacity Building and the International Cooperation Subgroups will*

have an interest in Outreach, and the User Requirements and Outreach Subgroup should take responsibility for arranging this coordination. Higher level outreach efforts should be pursued as well, perhaps in the International Cooperation Subgroup or by the GEO Co-Chairs.)

VI. Architecture

The Architecture Subgroup will need, as soon as practicable, to have a substantial input on user needs from the Requirements and Outreach Subgroup. In the short time available, it is unlikely that this input can arrive in time for the Architecture Subgroup to take it adequately into account in preparing its contribution to the draft Framework. In the first instance the Architecture Subgroup will need to determine at what level of detail the architecture should be specified. Is the WMO, WWW-GOS the appropriate level (including all the information on data formats and collection techniques) or is a more detailed treatment needed?

It is therefore suggested that, for this initial purpose, the Architecture Group might concentrate on taking into account the existing Earth observation systems and the ongoing developments - both in situ and space-based - to improve their efficiency, as well as to provide a first top level appreciation of the architectural form into which the GEO Initiative may conveniently develop.

Any recommended Architecture will need to allow access to existing observations as well as those that become available in the longer term. Current international Earth observing systems include

- WMO's World Weather Watch and its Global Observing System;
- Global Climate Observing System (GCOS);
- Global Ocean Observing System (GOOS); and
- Global Terrestrial Observing System (GTOS).

It should be noted that the responsible agencies for these systems, which include *in situ*, aircraft and space observations, are all Partners of IGOS-P. Valuable additional information is provided by the CEOS Handbook and by the IGOS Partnership Theme Reports.

Of course there are other observing efforts that are perhaps only partially within the four mentioned above, and others perhaps are not included at all. Some examples could include BRSM (Baseline Surface Radiation Network), FLUXNET (Global network to measure exchange of CO2, water vapour and energy between terrestrial ecosystems and the atmosphere), International Arctic Buoy Program, international seismic networks, and volcano observatories – to name but a few.

None of the systems listed above is sufficiently comprehensive nor adequately supported (politically, financially and technically) to accomplish the full purpose of the GEO Initiative. Some work on unrealistically tight budgets, particularly in relation to *in situ*

observations where dedicated staffing resources are very scarce. They all nevertheless constitute valuable building blocks, and can provide an insight into the difficulties that have to be overcome in giving effect to the aims of the Earth Observation Summit Declaration (Washington).

The important question of resource requirements cannot be avoided. This may need to be addressed by a joint task force from the Architecture and International Cooperation Subgroups, and cannot be provided in time for the draft Framework.

VII. Data Utilization

This crucial aspect is complicated by the fact that several information components are in fact outside the scope of the GEO Initiative. The generation of useful products, for instance, will require an integrated approach for sharing multi-scale data sets and model output. Increasing the utilization of existing data is essential, and mechanisms will also be needed to ensure proper interfaces between Earth observation information models and the decision support tools used by decision makers. The product of the GEO Initiative will be incomplete if these peripheral areas are not considered in consultation with the relevant user bodies.

It will be important to define common language and protocols, as has been done within the WMO, in order to enable systems to speak to systems.

In working to develop a long-term data utilization strategy, it is suggested that the contribution of the Data Utilization Subgroup to the draft Framework must already demonstrate the complexity of this area, and provide assurance that the necessary liaison with other Subgroups (International Cooperation and User Requirements in particular) is being tackled, if necessary by the formation of joint task forces, and that the most important external interlocutors have been identified, so that these aspects can be addressed immediately after GEO-2.

VIII. Capacity Building

Because there are already many initiatives in building Earth observation capacity, priority will initially be given to identifying what already exists or is firmly planned by local and national governments, by regional organisations and, of course, international organisations. The initial aim of the Capacity Building Subgroup will be to identify priority areas in which Earth observation capacity building would have the greatest impact and benefit on local and national societies.

Special attention is being given to the various activities that have been developed as a part of the follow up to WSSD. The efforts of WMO, UNOOSA (including the UNISPACE Action Teams), CEOS and IGOS-P in this domain are all worthy of attention.

IX. International Cooperation

This Subgroup will need to identify its interfaces with other Subgroups, and liaison meetings between Subgroup Co-Chairs will be required, and perhaps the creation of inter-Subgroup task forces to deal with specific topics which overlap two or more Subgroups.

For the purposes of the draft Framework, therefore, the International Cooperation Subgroup should place emphasis on identifying example organisational and institutional mechanisms for potential future consideration for an ongoing GEO Initiative, and beginning to make a first assessment of gaps, shortcomings, and opportunities (or at least identifying criteria to be used for such an assessment).

Major tasks include:

- Investigating how best to move from the initial 34 member nations and 22 participating agencies to effectively cover the whole world; whilst maintaining a viable executive coordination and oversight function;
- Identifying entities capable of expanding into a wider operational role;
- Ensuring that no existing entity with a potential input is excluded or any relevant effort missed; and
- Assuring an acceptable balance of benefits to developed and developing countries.

X. The Way Ahead

GEO-2 is expected to give guidance on the suitability of the draft Framework, so that the five Subgroups and the Secretariat can transform it into the Framework required for the Tokyo meetings. It appears at present that the same structure of Subgroups will be appropriate for this next stage of the work, but it will be necessary for the Framework also to go into some detail on how it is proposed to transition from the Framework to the 10-year Implementation Plan.

(It is suggested that it would be premature in the draft Framework to speculate on how the Framework is to be transformed into the Implementation Plan. Work on this can indeed start in November, but it would be unrealistic to give an undertaking to have a meaningful plan in time for the November GEO-2.)