IGS

# EXECUTIVE REPORTS

# IGS Governing Board 1999-2002

*Christoph Reigber*

GeoForschungsZentrum, Potsdam, Germany

## Introduction

These two years continue to realize the collective success of the IGS. A key focus of both years has been the IGS Strategic Plan and the process for implementing actions to accomplish the objectives. The key parts of this plan refine the mission, long term goals and objectives of the IGS which are included here. The directions of the IGS as formulated in this plan promise productive and rewarding years to come in this unique global federation of the IGS.

## Mission

The International GPS Service is committed to providing the highest quality data and products as the standard for global navigation satellite systems (GNSS) in support of Earth science research, multidisciplinary applications, and education. These activities aim to advance scientific understanding of the Earth system components and their interactions, as well as to facilitate other applications benefiting society.

## Long-Term Goals and Objectives

The IGS strives to:

- Provide the highest quality, reliable GNSS data and products, openly and readily available to all user communities.
- Promote universal acceptance of IGS products and conventions as the world standard.
- Continuously innovate by attracting leading-edge expertise and pursuing challenging projects and ideas.
- Seek and implement new growth opportunities while responding to changing user needs.
- Sustain and nurture the IGS culture of collegiality, openness, inclusiveness, and cooperation.
- Maintain a voluntary organization with effective leadership, governance, and management.

The final document was approved by the Board in late 2001 and published in March of 2002. Separate copies are available from the Central Bureau.

*Highlights*

The table below indicates the significant events of the IGS and more are described in the submissions to this document and the Technical Reports.

*IGS Significant Events 2001*

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| January | R. Weber replaces T.A. Springer as IGS Analysis Coordinator, University of Bern |
| February | • LEO workshop, GeoforschungsZentrum Potsdam<br>• First meeting of the IGS Real-Time Working Group, Co-Chairs named, M. Caissy, NRCan and R. Mullerschoen, JPL |
| Early 2001 | IGS Predicted product terminated, IGS Ultra officially accepted which includes the prediction. |
| March | IGS Board establishes the International GLONASS Service Pilot Project, IGLOS-PP |
| March 9-17 | CONSAS and AFREF Meeting in Capetown supported by the Central Bureau |
| *March 25* | *IGS Governing Board Meeting, Nice, France* |
| | TIGA Project established by the GB, Chaired by T. Schoene, GFZ |
| April | High Rate Tracking Campaign for Ionospheric research during solar eclipse |
| April 23-27 | GLOSS meeting Hawaii joint with TIGA project |
| mid-2001 | IGS Workshop Proceedings published externally:<br>GPS Solutions: Analysis Center Workshop, September 2000 US Naval Observatory<br>Physics and Chemistry of the Earth: Network Workshop of the IGS Oslo, Norway, Norwegian Mapping Authroity |
| **September 1** | *IGS Governing Board Meeting, Budapest, Hungary at the IAG General Assembly* |
| **December 9** | *IGS Governing Board Meeting, San Francisco, California* |
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*2002 Significant Events*

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| January | Ionosphere Workshop, ESA/ESOC, Darmstadt, Germany |
| Early - 2002 | IGS Strategic Plan 2002-2007 Completed and Published |
| April | Ottawa Workshop – 'Towards Real-Time', Natural Resources Canada |
| **April 11** | *IGS Governing Board Meeting, Ottawa, Canada* |
| | Data Center Working Group established naming C. Noll as Chair |
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| June | IGS Representation on the UN GNSS Action Team, Vienna |
| June 21 | Marks ten years since IGS Pilot Project initiated |
| July | UN Regional GNSS Workshop, Lusaka, Zambia<br>AFREF meeting |
| **September 10** | *IGS Governing Board Meeting, Potsdam, Germany* |
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| **December 10** | *IGS Governing Board Meeting, San Francisco, California* |
| | •J. Dow elected to succeed C. Reigber as IGS Governing Board Chair<br>• GNSS Working Group established with R. Weber as Chair<br>• IGS/BIPM Pilot Project dissolved as timing activities become part of IGS official suite of products, K. Senior, US Naval Research Lab named timing Coordinator. |

*2001 Key Events*

A major challenge to the IGS was met by Prof. R. Weber, who succeeded Prof. T. Springer as IGS Analysis Center Coordinator mid-term. This demonstrated the University of Bern's deep commitment to this task through 2002 and was greatly respected by everyone. In February, GeoForschungsZentrum organized a Low Earth Orbiter Workshop in Potsdam, Germany, which was co-hosted by the IGS. This was well attended and provided a venue to discuss the end-to-end aspects of LEO missions, particularly CHAMP, and their applications which include POD, gravity, atmospheric occultation, ionospheric tomography. Following the workshop, the first meeting of the IGS Real-Time Working Group was held in Potsdam to develop the charter and technical approach to building a real-time IGS sub-network and related processes. The IGS supported a campaign of the Ionosphere Working Group to collect and analyze high-rate data during the period of the total eclipse of the sun during April.

A new project called TIGA was established within the IGS to use GPS observations at tide gauge bench-mark stations in order to assess long-term sea level change. GPS observations will be used to remove the signals from coastal crustal deformation or subsidence from the long-term records. The TIGA has very challenging vertical measurement requirements that will span decades. The project has facilitated analyzing data from stations with high latency data availability – some collected only once per year from remote locations with no access to the internet.

The need for a continental reference system in Africa has been increasingly underscored and is termed AFREF. Discussions were held in Capetown, South Africa with Surveying and Mapping representatives from most of the southern African nations to discuss and plan a regional realization of AFREF and included representatives from the Central Bureau. See the report by Wonnacott in this annual report.

*2002 Key Events*

A true highlight of the year was a full workshop of the IGS titled 'Towards Real-Time' skillfully managed by the Natural Resources of Canada, host and local organizer in April. This was the first workshop in many years that brought all components of the IGS together and it was agreed that this was an excellent workshop. Proceedings of this Ottawa workshop are available at the IGS website. A workshop to discuss the status of the Ionosphere Working Group was held in January at ESA/ESOC in Darmstadt.

IGS became a member of a United Nations Action Team on Global Navigation Satellite Systems (GNSS) with the Central Bureau Director as the designated representative. This Team focuses on the use of GNSS especially in developing countries, and is chartered by the UN Office of Outer Space Affairs in Vienna to address various GNSS related issues. More progress is expected as the Team prepares its report for the 2004 UNISPACE conference.

The LEO mission GRACE launched successfully promising additional data for the LEO Working Group. At the December Governing Board meeting, my term as Chair of the IGS Governing Board was completed and Prof. John Dow of ESA/ESOC was elected to lead the

Board and the IGS. A proposal for the next Analysis Center Coordinator was also approved by the Board with Prof. Gerd Gendt, GFZ, to succeed Prof. Robert Weber, AIUB and Technical University of Vienna. This was unanimously approved based on technical expertise and committed support of GFZ. The expected transition period is set to be complete by mid-2003. A GNSS Working Group is set up with plans to position the IGS to take advantage of the future Galileo and modernized GPS. Due to all of these increasing demands on the data and product access, a Data Center Working Group was approved earlier this year. IGS timescale activities moved seamlessly from USNO to Naval Research Laboratory with continued expertise.

I have very much enjoyed working with the Board and the people of the IGS, and am convinced that the IGS will continue to flourish. I will remain on the Board until 2004, working on the strategic issues and the new project of the International Association of Geodesy: Integrated Global Geodetic Observing System ( IGGOS).

# Central Bureau Status and Perspective

*Ruth Neilan*

Director IGS Central Bureau
NASA/Jet Propulsion Laboratory
California Institute of Technology

The Central Bureau continues to promote the IGS organization, data and data products as setting the world standard for GPS/GNSS geodetic applications as outlined in the IGS Strategic Plan. The Central Bureau was responsible for the organization of the strategic planning process, preparation of all documents, and the editing and publication of the plan. This was a major activity and the Board's consensus on the plan is a significant milestone in the evolution of the IGS. The Central Bureau is responsible for the day-to-day management of the Service. With 200 organizations in over 80 countries and a ground network of ~350 stations, this requires daily interfaces on many different levels globally. The separate summary of the IGS Network Coordinator is included in this annual report and demonstrates the vital technical tasks of the Central Bureau. The CB is also responsible to arrange and organize all Board activities and is involved in the supporting the planning and logistics of all IGS workshops and meetings.

In 2001-2002, the CB focused effort on outreach to other nations to garner participation in the IGS for a mutual benefit. Continued discussions with principals of China's 'Crustal Motion Observation Network of China' (CMONOC) at the China Seismological Bureau (CSB) demonstrate their deep interest in becoming more involved with the IGS. Similarly in Africa, the CB has been active in 2000 and 2001, to further the concept of a continental reference system for Africa – 'AFREF', taking part in meetings and discussions in Capetown. The initiative is being embraced by principal people within Africa, a key requirement for the long-term viability of a reference frame realization.

The CB began working with the United Nations Office of Outer Space Affairs (UN/OOSA) to assist in the planning of the regional series of UN/GNSS workshops, with the objective to obtain broader international participation in these meetings. In particular, a key workshop took place in Lusaka, Zambia in July 2002 where many people from throughout Africa were present. One of the sessions of the workshop was devoted to unifying the African continental reference frame (AFREF) and was very well attended. The IGS exhibit was displayed and nearly all handout materials evaporated due to keen interest. One of the main problems facing Africans is the ability to interface with the international community and this was seen as an opportunity for them to make connections that help to build up their base of sustainable technology.

This year the IGS published workshop proceedings in conjunction with outside publishing companies as a variant on CB publications: GPS Solutions published the proceedings from the 2000 Analysis Center Workshop (some copies are available from the CB); and Physics and Chemistry of the Earth published the IGS Network Workshop proceedings joint with 'Towards Operational Meteorology', the European COST 716 Action "Exploitation of Ground-Based GPS for Climate and Numerical Weather Prediction Applications". These are excellent proceedings,

however, copyright issues preclude their posting to the IGS website which limits the availability of information, especially to the wider global community.

The CB continues to improve efficiencies with very limited resources and staff and looks forward to working with the GB to accomplish one of the objectives of the strategic plan, '*to strengthen and stabilize the Central Bureau'.*