



International Gravimetric Bureau (BGI)

web: bgi.cnes.fr

Director: **J-P. Barriot** (France)

Objectives and Terms of Reference

The main task of BGI is to collect, on a world-wide basis, all gravity measurements and pertinent information about the gravity field of the Earth, to compile them and store them in a computerized data base in order to redistribute them on request to a large variety of users for scientific purposes. The data consists of: gravimeter observations (mainly location – three co-ordinates, gravity value, corrections, anomalies...), mean free air gravity values, gravity maps, reference station descriptions, publications dealing with the Earth's gravity field. Other data types are sometimes used for data validation and geophysical analysis, such as satellite altimetry derived geoid height and gravity anomalies, digital terrain models, spherical harmonic coefficients of current global geopotential models.

BGI has been developing various algorithms and software for data validation and analysis, as well as its own data management system. A large number of services are offered to the users (see below).

All kinds of gravity data can be sent to BGI, with or without restrictions of redistribution to be specified by the contributors, sometimes in the form of a protocol of usage.

Program of Activities

- Continue publication of the Bulletin d'Information,
- Continue data collection, archiving and distribution: emphasis will be on those countries which have not, or seldom, contributed to the BGI data bank. First priority is then given to careful data evaluation; Land data and marine data are validated using different software. Satellite altimetry derived free-air anomalies are to be more and more frequently used to validate sea measurements.
- Assist IGGC in setting up the International Absolute Gravity Data Base Station (IAGBN), and assist in the intercomparisons of instrument.

- Establish simple procedures for the collection and archiving of absolute measurements.
- Link with the commission for the Geoid in data preparation in view of geoid computations and evaluations to be performed by the International Service for the Geoid.
- Assist in promoting satellites techniques to improve our global knowledge of the Earth's gravity field: satellite-to-satellite tracking, satellite gradiometry, etc.

Structure and membership

BGI is one of the offices of the Federation of Astronomical and Geophysical Data Analysis Services (FAGS). It may also be considered as an executive office of the International Gravity and Geoid Commission (IGGC).

It has a Directing Board composed of the following members:

Voting members

- BGI Director: J.P. Barriot (France)
- M. Vermeer (Finland)
- R. Forsberg (Denmark)
- M. Sideris (Canada)
- G. Boedecker (Canada)
- J.E. Faller (USA) to be elected
- E. Groten (Germany) to be elected
- P.P. Medvedev (Russia) to be elected
- S. Takemoto (Japan) to be elected

Non voting members

- L. Robertsson (France)
- B. Richter (Germany)
- M. Becker (Germany)
- Secretary: J. Liard (Canada)
- Secretary: E. Klingele (Switzerland)

Ex-officio:

- IGeS Director: F. Sanso (Italy)
- FAGS representative: P. Paquet (Belgium)

The central office is located in Toulouse, France, in the premises of the Observatoire Midi-Pyrénées, of which it is one of the services. The other supporting organizations are: the Centre National d'Etudes Spatiales, the Bureau de Recherches Géologiques et Minières, the Institut Géographique National, the Centre National de la Recherche Scientifique (via the Institut National des Sciences de l'Univers), the Ecole Supérieure des Géomètres et Topographes, the Institut de Recherche pour le Développement, the Service Hydrographique et Océanographique de la Marine. There exists a covenant between these agencies to guarantee their support to the BGI.

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BGI Bulletin d'Information

The office issues a Bulletin d'Information twice a year (generally in June and December). It contains:

- General information in the field of the Bureau itself, about new available data sets,
- Communications at meetings dealing with gravimetry (e.g. IGGC meeting).

Every four years, an issue (which may be an additional one) contains the National Reports of Activities in Gravimetry. The full catalogue of the holdings is issued every two years. The Bulletin is sent free of charge to individuals and institutions, which currently provide information and/or data to the Bureau. In other cases, information and subscription prices can be obtained on request. There exist 85 issues and about 360 subscribers as of December 1999.

Providing data to BGI

Essential quantities and information for gravity data submission are:

Position of the site:

- Latitude, longitude (to the best possible accuracy).
- Elevation or depth.
- For land data: elevation of the site (on the physical surface of the Earth).
- For water stations: water depth.

Measured (observed) gravity, corrected to eliminate the periodic gravitational effects of the Sun and Moon, and the instrument drift.

Reference (base) station (s) used. For each reference station (a site occupied in the survey where a previously determined gravity value is available and used to help establish datum and scale for the survey), give name, reference station number (if known), brief description of location of site, and the reference gravity value used for that station. Give the datum of the reference value; example: IGSN 71.

Give supplementary elevation data for measurements made on towers, on upper floor of buildings, inside of mines or tunnels, atop glacial ice. When applicable, specify whether gravity value applied to actual measurement site or it has been reduced to the Earth's physical surface (surface topography or water surface). Also give depth of actual measurement site below the water surface for underwater measurements.

For marine gravity stations, gravity value should be corrected to eliminate effects of ship motion, or this effect should be provided and clearly explained.

Services

The most frequent service BGI can provide is data retrieval over a limited area. Data are sent on diskettes or printouts or transferred electronically. Data coverage plots may also be provided, usually over 20° * 20° areas. Cases of massive data retrieval requests may be considered; they are studied and may be processed in a specific way. The simplest way for users is to acquire the open files of the BGI database, which are on two CDs.

Other services include:

- Data screening.
- Provision of gravity base station information.
- Data evaluation and gridding.
- Computation of mean values.
- Contouring.
- Supply of, or information on existing maps.

The costs of the services have been established in view of the categories of users—mostly contributors of measurements and scientists, and also considering the large amount of our host organizations. The charging policy is explained in detail in the Bulletin d'Information.

Some of the services may be provided free of charge upon request, to data contributors, individuals working in universities, such as students, and generally to any person who can contribute to the BGI activities on a data or documentation exchange basis.