

First Meeting of the United Nations Subcommittee on Geodesy

26-27 November 2017
INEGI, Mexico City, Mexico

Summary Report

Introduction

The First Meeting of the United Nations Subcommittee on Geodesy (SC-Geodesy) was convened in Mexico City, Mexico, from 26-27 November 2017, and was hosted by the Government of Mexico through the National Institute of Statistics and Geography (INEGI). This meeting preceded the Fifth High Level Forum on UN-GGIM held from 28-30 November 2017, also hosted by INEGI, Mexico. The convening of these important technical meetings back to back was welcomed by participants and provided a considerable opportunity to leverage the many synergies and commonalities that existed between these two communities.

The SC-Geodesy was attended by 23 participants from: Argentina, Australia, Burkina Faso, China, France, Germany, Japan, India, Mexico, Norway, the Russian Federation, Saudi Arabia, the United States of America as well as representatives from IAG, FIG, NASA, the University of the West Indies, SIRGAS and UNSD as the Secretariat. The meeting was initially Co-Chaired by Mr. Gary Johnson (Australia) and Ms. Laila Loevhoeiden (Norway) before the SC-Geodesy nominated Mr. Alexey Trifonov (Russia) as the new Co-Chair to replace Norway.

The objective of the first SC-Geodesy was to collectively work on the implementation plan of the roadmap for the Global Geodetic Reference Frame (GGRF), further establish the governance plan for the SC-Geodesy, and receive feedback from its focus groups (Geodetic Infrastructure, Education, Training and Capacity Building, Communications and Outreach, Policy, Standards and Conventions and Governance). The meeting was conducted through a combination of presentations, updates, and discussion sessions. The agenda of the meeting is provided in Annex I to this report.

Session 1 – Introductory Session

Chair: UN SC-Geodesy Co-Chairs

Purpose: *Update SC-Geodesy members on progress and other relevant meetings.*

Following welcome remarks and introductions by the SC-Geodesy Co-Chairs and INEGI Mexico, the introductory session opened with a review and summary of progress. The last meeting was held in New York on August 1st 2017 on the margins of UN-GGIM 7th session. Since that time, the SC-Geodesy has been elevated from a Working Group as an outcome of a decision made by the UN-GGIM Committee of Experts at its seventh session in August 2017. Going forward, the SC-Geodesy will continue towards knowledge exchange, implementation of the GGRF roadmap, and the interaction with existing, new and emerging global and regional bodies.

Pertinent observations by the Co-Chairs for consideration by the SC-Geodesy included:

- We are currently at a historical moment – Geodesy has existed as a science for more than 150 years. In this time, much has been accomplished, but the past three years have been very special. These events have included:

- The General Assembly resolution 69/266, adopted in February 2015, entitled ‘A Global Geodetic Reference Frame for Sustainable Development’;
- A road map for the enhancement and sustainability of the GGRF was subsequently developed by the then Working Group and provided to UN-GGIM at its sixth session, held in August 2016; and,
- The creation of this SC-Geodesy in 2017.
- As things progress, we will move into supporting the creation of regional Geodetic Reference Frames, as a derivation of the Global Frame;
- It is not a level playing field – we need to ensure there is a sufficient level of capability and capacity for developing countries to use and contribute to the reference frame.

The SC-Geodesy proceeded to discuss the nature of government engagement and geodesy. This discussion raised the following points (captured in order of inputs):

- There is a strong need to bring the intergovernmental mandate to geodesy;
- The many geodetic products and services that are now being provided are being picked up extensively by industry; but,
- Governments are not necessarily aware that this is happening and the positive impact that this can bring;
- Communication, outreach, and training are key to the amelioration of this.

The SC-Geodesy was then asked about how to improve participation to have a representation from Member States and professional organisations to add to its value proposition. This discussion raised the following points (captured in order of inputs):

- Review the options to reach out again to the Regional Committees of UN-GGIM to complete nominations on a pro-rata basis; for those nations not nominated, it’s possible to nominate as an associate member;
- Associate members, International Association of Geodesy (IAG) and the International Federation of Surveyors (FIG) are key members that are recognised. Other associate members have the potential to be invited. However, IAG and FIG are primary actors as they not only use the reference frame, they also contribute to it;
- It is the aim of the SC-Geodesy to be as inclusive as possible – but it’s important that the representation of the Member States is paramount. This is a nuanced process, as some like NASA, are part of the government process/system – others are not. Expert contributions are always valuable and needed. For those that are important to participate, they can be invited as an observer. Complexities occur with committees/federations like ESA who are not a Member State, but would be able to represent their organisations as an observer;
- There is a challenge of no nominations from Africa – need to find suitable representatives from Africa. It’s important for the SC-Geodesy to find representatives from all regional entities, but also to share knowledge and capability through to underserved regions and support knowledge exchange;
- In considering the nature of engagement between technical and political officers within government, the initial work has been undertaken at a technically focused level, not at the political level. This has enabled the rapid progression of the work of the SC-Geodesy, but has had the downside of sitting outside the standard UN process. The 2016 ECOSOC resolution (E/RES/2016/27) that strengthened the mandate of UN-GGIM, inclusive of the political engagement and perspective on geospatial information globally, means that UN-GGIM now can report directly and more often into the Bureau of ECOSOC as well as annually via the formal reporting.

Session 2 – Development of Road Map & Implementation Plan

Chair: UN SC-Geodesy Co-Chairs

Purpose: *Update SC-Geodesy members on progress of the road map implementation and feedback from the focus groups.*

Session 2 considered the development of the road map and the implementation plan. It sought updates from attending Focus Groups of the SC-Geodesy: Geodetic infrastructure (Australia); Education, training and capacity development (FIG); Outreach and communication (Norway); and, Governance (Norway). Following this introduction, the Focus Groups presented.

Session 2a. Focus group on geodetic infrastructure (Australia)

This session provided an update on the activities of the focus group in supporting the inter-governmental process in the further development of the global geodetic reference frame, and in having a frame relevant for adoption to sea level rise and climate change generally. This will necessitate an understanding of vertical datums.

It was presented that there are three types of infrastructure to be enhanced to achieve a full geodetic infrastructure: Physical Geodetic observing instruments; Policies, standards and conventions; and, Education, training and capacity building. These infrastructures will be underpinned by: Appropriate governance and Outreach and communication.

The ensuing discussion raised the following points (captured in order of inputs):

- We have the dual challenge of 1) Aging infrastructure; and, 2) A bias towards the northern hemisphere. Here, even there are gaps in the Northern infrastructure with opportunities for improved coverage. However, in the global south it can be non-existent, this is a situation that needs to be investigated and mitigated.
- This is further complicated by the challenge of global coordination. This coordination is not yet fully effective and improvements can be made to facilitate sharing of best practices, improved data exchange and federation.

The following recommendations were distilled:

- At a minimum, we aim to continue with the current systems – *but this is a minimum requirement*;
- We need to distribute the core infrastructure so that the reference frame can be improved through enhanced geometry;
- We need to ensure that we coordinate so to stop/prevent and mitigate system(s) and hardware failure; and, ensure that services under the provision of IAG can continue and be interoperable in the current infrastructure;
- We need to discuss with our communities on what mechanism(s) can support capacity development and knowledge exchange between nations. Geodetic data is inconsistently shared across Member States. This is due to a combination of culture and policies but also a sparseness of infrastructure. Accordingly, data sharing needs to be done while respecting local and national legal and policy frameworks;

Session 2b. Education, training and capacity building (FIG)

This focus group provided updates on the Education, Training, and Capacity Building (ETCB) focus group to enhance the implementation of the GGRF. An overview provided the purpose of the focus group: to assess the current availability of education, training, and capacity building, identify gaps to enable the use of the GGRF, and foster a culture of sustainability with its use.

FIG expanded on the challenges faced by the SC-Geodesy in supporting skills/capacity development. This is challenging in some countries due to a lack of fundamental geodetic skills or that the capacity of those individuals with those skills is low. This is compounded by poor skills and knowledge generation. Geodetic concepts and theory are scanty taught in universities in developing countries; this is compounded by the fact that the technical competencies of geodesy are even less taught. As such, there are limited appropriate skills, severely limiting capacity to push things forward: *we need to improve the capability and the number of people with these skills.*

It was further elaborated that one of the tasks of the focus group is to develop an *Educational Needs Assessment* that will establish a priority list of short- and long-term training needs, their objectives and required resources. This will require strong organisational support from national geodetic organisations and from national and international organisations such as IAG and FIG. The Education Needs Assessment will:

- Provide a framework for Member States to identify both their level of competency and their requirements;
- Maintain a register of Member States self-reported “level” of competency, professional, and technical requirements;
- Identify training and educational gaps for Member States, working on a regional basis where appropriate;
- Provide training modules and assist with running specialised training courses to fill gaps;
- Encourage other agencies to run specialised training where gaps have been identified;
- Maintain a register of courses and training opportunities;
- Maintain a register of trainers and training institutions;
- Identify SDG indicators that benefit from, or require geodetic data.

In collaboration with UN-GGIM Asia Pacific (UN-GGIM-AP), the focus group has proposed to send out a self-evaluation questionnaire. It was also noted that not all countries will need to reach the highest level of this framework, just enough need to be there to share knowledge – emphasising the need for collaborations across the community.

The following discussion raised the following points (captured in order of inputs):

- Are countries technically proficient to fully appreciate the importance of the GGRF? Are we working at the right level for outreach? It can be challenging for countries to fully recognise where they are in the development of their national reference frames, and to admit that to the world.
- The SC-Geodesy will need to consider appropriate mechanisms for political engagement, with the need to bridge the technical and political environments. Technology can enable it and can support an enablement of this bridge. This is critical to support other areas, such as disasters, but we have under-representation from disaster prone member states, here geodesy can have the largest impact, but others do not engage;
- The ETCB focus group should engage further with the UN-GGIM Academic Network;
- The SC-Geodesy should consider what is an optimum level of geodetic attainment for a country, based on the individual country’s geodetic capacity and capability. *This decision is one that needs to be taken by the individual countries, be country owned and country led, but countries should consider how to achieve a level that is suitable for them.* The SC-Geodesy should also recognise that countries reached the highest Level of the framework (the most advanced nations) should exist in each region. Currently, there is strong leadership from Europe and North America, but if other regions will benefit, there needs to be further representation.

This led to specific recommendations and actions being distilled from the focus group:

- **We need development organisations to consider investments in national and regional geodetic capacity;**
- **Member States are to establish a group with IAG to support advancing enhanced education and skills;**
- **We need to work with the Regional entities to ensure that we can achieve our potential; also,**
- **It was proposed to consider the permanent establishment of the ETCB, but further discussion is still needed;**
- **The focus group will present an implementation for the Educational Needs Assessment (below) for the committee to consider at the next meeting.**

Session 2c. Focus group on outreach and communication (Norway)

This focus group is covering the detailed actions in raising awareness through communications. The overview discussed the crucial nature of geodesy, and emphasised that knowledge of its importance isn't common in decision makers. We need to ensure high level policy makers understand the value of geodesy. This is further challenged by the scientific, complex nature of geodesy. But, it is up to the Member States to initiate, encourage and promote improved outreach cooperation between and within governmental agencies.

The focus group recognised that no one country can support outreach and communicate work alone, we need to work in a best effort basis, as support is given. We are building a GGRF ambassador program, we will build a web of communication experts.

The following discussion raised the following points (captured in order of inputs):

- Outreach and communication is fundamental to what we do. The focus group is working on creating specific actions from the outreach and communications group to support the translation of objectives of the activity into actions;
- We need to consider the political reality and timescales with the adoption and generation of policy. We should link the development of geodesy with the SDGs – this could help drive traction and impact of the GGRF. Through framing the GGRF that geodesy is important because of specific component in their agenda, this could help accelerate understanding of the importance of geodesy and the GGRF.
- The outreach and communications group is engaging two constituencies: 1. Geodetic officials in Member States; and, 2. Political officials. Governments wish to do things, but there is a limitation of funds.

This led to specific recommendations and actions being distilled from the focus group:

- **If SC-Geodesy members create a video or a briefing note they should share it on the website. This will help drive interconnectivity, cooperation, and impact that we can have collectively. We should add functionality to the website to achieve this;**
- **The focus group will explore how to work with international funding organisations i.e. World Bank to work at a regional level. A key factor for this is to understand the financial impact to GDP of geodesy;**
- **The focus group asks all SC-Geodesy members to invite communication experts in your organisation into geodesy. These experts and ambassadors need to fully represent all regions. To support this, we have a landing page for outreach - <http://www.ungrf.org/> containing for-print versions of geodesy fact sheets;**

Session 2d. Geodetic Infrastructure Focus Group (Australia)

This focus group is covering the GGRF infrastructure part of the implementation plan. The following points were put together as a joint vision by the SC-Geodesy:

- We hope that the GGRF's infrastructure is geographically distributed. Member States will need to 'fill the gaps';
- We aim that regional entities are organised to provide focal points for geodetic activities;
- There isn't a 'magic number or location' for GNSS sites. But there is guidance to Member States for them to decide for themselves, but nations should align to the Global Geodetic Reference Frame to ensure that we are aligned with GNSS;
- Before we succeed at a national level, we need to facilitate international cooperation to build capacity and strengthen education, share joint aspirations and best practice;
- Within the comprehensive plan, we need to develop comprehensive counter-factual messages – i.e. point out what will happen if countries *do not* support the strengthening of the global geodetic system. Participation is also challenging as some nations that want to get involved do not always know where to start.

This led to specific recommendations and actions being distilled from the focus group:

- **The global infrastructure plan will support developing nations to achieve a geodetic system. We need to communicate the benefits that will be achieved once this infrastructure is in place;**
- **We should consider how we kick-start the process of cooperation and collaboration between countries. The SC-Geodesy will draft a comprehensive plan for this. Also the coordinated science plan for GGRF infrastructure will need to be developed as soon as it is possible.**

Session 2e. Focus group on governance (Norway)

This focus group is covering the variety of government mechanisms to coordinate the maintenance and development of the GGRF. It was presented that some bilateral agreements exist between space agencies and national mapping organisations, *but there is no comprehensively overarching international binding governance for the GGRF*. Accordingly, contributions by Member States are given by individual Member States with no guarantee of availability or long-term continuity as support *is given as a best effort basis, with no legal enforcement*. This challenge of governance within the global geodetic system is further complicated as there is little visibility of the GGRF. These challenges further restrict budgetary provision within Member States for the GGRF. A method of improving would be to enhance the role/engagement in the regional entities. Further points made include:

- The current working thesis of the focus group for governance is that the most appropriate governance arrangement for global geodesy is a UN specialised agency. However, the establishment of such an entity would be extremely difficult in the current global environment, and without considerable donor funds. The focus group proposed to write a position paper to establish a global geodetic entity, and to answer the question: Where will the world be in 50 years, if we have an international organisation for geodesy, conversely, where will we not be?
- There is a difference between specialised agencies of the UN (those that submit budgets to the UN Secretary General) and other international organisations – as a method of progressing the GGRF consideration should be made on how to expand the GGRF. This is aided by there being many lines of cooperation that already exist – such as bilateral commitments;
- We need counter arguments to remedy them in the position paper: why this approach of creating a specialised agency instead of strengthening existing infrastructure, such as via the IAG, Group on Earth Observations, and other geodetic agencies, associations;

The following discussion raised the following points (captured in order of inputs):

- When considering integration with international organisations we should consider who else to discuss with to get the right constituency. Additionally, it is possible for others to wonder what are the links with the 2030 Sustainable Development Agenda and Geodesy;
- Geodesy has an important role to play in land information, but there is a significant capacity gap between developed and developing countries - further dialog into policy discussions will cover this;
- Regarding the creation of a UN specialised agency, there is a challenge to bridge between inter-governmental engagement and national implementation. Linking different initiatives, such as the IAEG to integrate statistics and geospatial information together will be important as there is a lot of inter-dependency between these agendas – whether it's in climate change, sea-level rise, SIDS and other agendas;
- The creation of a global geodetic entity is an interesting proposition - but UN-GGIM will remain as an intergovernmental Committee of Experts, as a group we should consider how to reduce complexity within this process.

This led to specific recommendations and actions being distilled from the focus group:

- **The structure of the Position Paper will be: Introduction; Arguments; Counter Argument; and, Conclusion;**
- **There is no one right answer to governance, however, the result must fully encompass the competencies of a specialised agency (such as communications and legal concerns).**

Session 2f. UN-GGIM Fundamental Geospatial Data Themes (UN-GGIM Secretariat)

This session was led by the UN-GGIM Secretariat. It started through briefing on the Fundamental Data Themes, stressing that these are not data sets – but broad categories. These fundamental data themes are now taking a broad adoption, for example by the World Bank. The intent is to guide countries that don't have a lot of background in the fundamentals of data to get started. It is also possible for other countries to target specific themes, based on their national requirements. This will be based on their own capacities, capacities and prioritisation set by policies. The fundamental data themes icon set is under preparation, in a similar manner to the SDGs There will be a technical workshop in Africa on technical implementation next year (in 2018). In preparation for this, the secretariat is currently working on understanding where the fundamental data themes fit within the construct of the 2030 Agenda and the 2020 Round of Censuses.

The ensuing discussion raised the following points (captured in order of inputs):

- The World Bank are developing/funding for datasets to be acquired for land administration and mapping. Often within that funding, there is a geodetic component, very often, the underlying geodesy isn't good enough to match the quality of work required;
- Geodesy is fundamental to producing good datasets, but this isn't fully taken on board by the funding/development agencies.

Session 3 – Development of the Five-Year Strategic Plan

Chair: UN SC-Geodesy Co-Chairs

Purpose: *Discuss the unique characteristics needed to contribute to the topics and needs of UN-GGIM:*

- Should there be a focus group or a task team that deals with capacity building?
- What is the five-year plan of the SC-Geodesy – what should it be?
- What modalities do we need to implement the concepts raised?
- In addition to the detail in the roadmap, how should the workplan items of the the SC-Geodesy be discussed within its remit? We have broadened our scope – what should we also articulate and update within our workplan?
- What is the plan/longer term vision once we've implemented the work plan? How do we implement it and how?
- The implementation plan has a goal of setting actions for member nations. In return, what action do you think the member nations should set the sub-committee?

Following this brief, four small discussion groups were formed and reported back the following, harmonised, points (captured in order of inputs):

- Governance is the critical factor and coordination within nations is crucial – need to keep an eye on capacity building and regional collaboration;
- The implementation within a government may take more than 5 years – how do we leave a legacy and support continuity of our programme?
- We really need to stress the benefits of the GGRF within and to neighbouring disciplines;
- There is a role within the Regional Commission to progress this – but we, as a sub-committee should work with the regional commissions to ensure consistency and fluency in the delivery of the message;
- Satellite missions and space agencies are major players. As such, the sub-committee needs to be very clear how it's interacting and moving forward.

This led to specific recommendations and actions being distilled from the focus group:

- **The Chair proposed a recommendation to move away from WGS84 for precise applications as it is not fit for purpose;**
- **Develop a timeline and see what is achievable over a five-year period. This should consider: Our Focus and Purpose, Unique Characteristics of the GGRF, and How we can achieve this?**

Session 4 – Business of the SC-Geodesy

Chair: UN SC-Geodesy Co-Chairs

Purpose: *Discuss the business of the SC-Geodesy*

This session began with discussing the business of the SC-Geodesy. Norway left the chair, with Russia ascending to the chair by unanimous vote. Germany, France, FIG, and India provided thanks to Norway's leadership and echo the (re)nomination of Australia and nomination of Russia.

Session 4a. Interaction with regional entities' GGRF working Groups

This session followed on from the previous day's discussion on governance and the need for regional engagement. The SC-Geodesy has a challenge in ensuring we have the right Terms of Reference to ensure outreach and engagement within the regions. This is crucial to resolve as different regions are in different levels of attainment with their geodetic capacity and capability.

The secretariat illuminated that there are bureau meetings, that ensure an ongoing connection between our activities and objectives. The secretariat also has working activities, under the global and five regional committees. An agreed action has been to produce a series of regional meetings, identify complementary events and join with those.

Session 4b: Interactions with Expert Groups and Working Groups of UN-GGIM

The UN-GGIM secretariat provided an overview of the UN-GGIM strategy for Strengthening the Global Data Ecosystem, focusing on the need to communicate the actions and needs of the SC-Geodesy in clear and consistent manner. The following discussion raised the following points (captured in order of inputs):

- The SC-Geodesy should act as a forum to share information, connect people within our community, and demonstrate the benefits of geodesy in economic terms. There is a broad extent of geodesy's products and services that enhance the impact of cooperation. This committee could provide that networking connection for those efforts; All participants of the SC-Geodesy have a responsibility to provide assistance to fully carry through this interaction;
- We can support SC-Geodesy members by making a map/communication plan to track what we're doing and be more systematic.

Session 4b. Update on Progress

This session opened discussion on the focus groups and for them to identify what they need to do for them to progress. This also considered, how they integrate their work into the SC-Geodesy's implementation plan. This may support more targeted recommendations to Member States.

The overall workplan and actions below will need to be drafted with implementation plans by the end of May in preparation for the eighth session of UN-GGIM.

Education, Training and Capacity Building Focus Group (FIG)

- The focus group suggests that it becomes a permanent, to fully focus capacity building;
- There is a high importance of collaboration with the UN-GGIM Academic Network and other academic institutions to deliver the aims of the focus group;
- The group stresses the four levels of geodetic attainment. It is very important countries self-report their level (through a questionnaire conducted by the focus group), but there are challenges of coordination internally within governments - This may mean that surveys do not land at the right level. The recommendation from India is engagement at an apex level and fit the approach of the questionnaire to those governmental processes.

Actions:

- **Identify the geodetic focal points globally to ensure a targeted approach to capacity development;**



- Start with the ETCB work programme with UN-GGIM-AP to see if this is a way forward. We will evaluate the efficacy of this via a questionnaire;
- Build up a registry of online courses (preferably in collaboration with the UN-GGIM Academic Network);
- Consider establishing benchmarks for countries to attain;
- Conduct a pilot questionnaire and evaluation to ensure the process of benchmarking a nation's geodetic attainment is as easy as possible.

Communications and Outreach Focus Group (Norway)

- The focus group is researching on how to get contacts from the regions, but the challenge is that not all regions are into geodesy - We need to put real people to the stories on geodesy. This will give it a human face;
- We need to integrate with other focus groups to work out mutual needs and requests;
- We need to communicate what geodesy means in a clear and cogent manner;
- We need to focus on our key messages – all communications should be based off that.

Actions:

- **SC-Geodesy delegates must engage their communications team into the outreach process;**
- **Provide the SC-Geodesy members with a set of desired skills for communicators;**
- **Build a web of communications experts;**

Governance Focus Group (Norway)

- The focus group has a working concept to establish a UN specialised agency. The focus group need to consider how to do the consultation and start communicating this intention to our ministries and potential donors of such an entity;
- The focus group wishes to work out the agreements and approaches to formalising the position paper on governance. This should include an understanding of our needs and missing skills;
- France countered by noting that we are not yet at the stage to propose something at the next session. We are not yet ready to work out what types of organisation we are dreaming of doing.
- In more immediate terms, we need ten core geodetic sites globally – we should consider the funding mechanisms to make this possible;
- The chair noted that the SC-Geodesy members should use their discretion with consulting their foreign ministries with regard to the recommendation of the focus group especially considering the decision of such magnitude.
- We may need to have a wider consultation internally with mapping agencies and other relevant internal government departments to gather as much information as possible
- Norway suggested that the SC-Geodesy discuss and consider whether revising the Terms of Reference can help improve GGRF governance. Should the ToRs be revised by the SC-Geodesy, they can be agreed by the Committee of Experts as its 8th Session. However, to do so would require the substantive change to the ToRs and agreement by the SC-Geodesy.

Actions:

- **The governance focus group will synthesize their work and efforts into a single position paper;**
- **The focus group to try to determine the most effective type of intergovernmental commitment that is needed to sustain the GGRF and ensure continued investments in GGRF infrastructure, the making and the use of conventions and standards, for training and capacity building and finally the implementation of the GGRF Road Map in general.**

Session 4c. New business

SC-Geodesy member France suggested that the subcommittee agree on a resolution regarding ITRF. The following was put forth:

- The International Terrestrial Reference System (ITRS) has been recommended by the IUGG and the IAU for applications in space and Earth Sciences. Access to ITRS is primarily through the International Terrestrial Reference Frame (ITRF). France proposed to adopt the ITRF by the UN-GGIM Committee of Experts as the standard reference for geospatial applications;
- There is some serious confusion within some areas of the geodetic community regarding the GGRF and ITRF, with many specialists believing they are different reference systems, regardless of their synchronicity. A unique reference system/frame is fundamental for ensuring interoperability of geospatial datasets
- France noted that there is a desire from the user communities to have an official decision on adopting the ITRS/ITRF as a *legal* standard. Though, it was noted that developments are currently being undertaken by the IAG for the definition and realisation of the international height reference system.
- Following this, the USA/NASA commented that resolutions would need to be submitted to the IAU process should follow the IUGG process as this will wait until their next assembly in 2021. Alternatively, if submitted prior to February it could go into the next congress.

Conclusion:

- **SC-Geodesy agreed that the discussion of items like this must be added to the agenda of the SC-Geodesy formal meeting in good time to secure an appropriate process.**

Action

- **SC-Geodesy member France is encouraged to promote the suggestion with necessary supporting material in good timing before the next formal SC-Geodesy meeting in China next year**
- **The co-chairs will work with the UN-GGIM secretariat to consider holding its next meeting on the margins of the UN World Geospatial Information Congress, being convened in China in November 2018.**

Session 5 – Wrap-up and closing session

Chair: UN SC-Geodesy Co-Chairs

Finally, the meeting was closed by remarks by the two co-chairs and the hosts, Mexico.