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Committee on the Peaceful Uses of Outer Space

Unedited transcript

606th Meeting
Tuesday, 9 June 2009, 3 p.m.
Vienna

Chairman: Mr. Ciro Arévalo Yepes *(*Colombia*)*

The meeting was called to order at 3.16 p.m.

The CHAIRMAN (*interpretation from Spanish*) Good afternoon, ladies and gentlemen. I now declare open our 606th meeting of the Committee on the Peaceful Uses of Outer Space.

This afternoon, we will re-open agenda item 7, report of the Scientific and Technical Subcommittee as we have received a request from Turkey to address the Committee on this item. Then we will continue, and hopefully conclude, our consideration of agenda item 8, the report of the Legal Subcommittee on its forty-eighth session. We will continue with agenda item 9, spin-off benefits of space technology: review of current status. Item 12, space and climate change, followed by the beginning of our consideration of item 13, use of space technology in the UN system. We will also begin item 14, use of space derived geospatial data for sustainable development.

This afternoon we will hear three technical presentations. The first by a representative of the United States entitled: Iridium/Cosmos satellite collision. The second presentation will be given by another US representative: consequences of the collision of Iridium 33 and Cosmos 2251. The third presentation will be given by a representative of the GEO and is entitled: operational use of space derived geospatial data: they key role of GEOSS.

I would like now to re-open agenda item 7, the report of the Scientific and Technical Subcommittee as I have received a request from the distinguished delegate of Turkey to take the floor. You have the floor.

Mr. C. ULUSOY (Turkey) Thank you Mr. Chairman. Thanks for getting back to agenda item 7. Our delegation would like to reiterate Turkey's dedicated support to the UNSPIDER programme as a practical tool to contribute to disaster management activities. To this end, I am pleased to inform the distinguished delegates that, upon the request of the UN Office for Outer Space Affairs, Turkey decided to nominate a senior expert to work at the UNSPIDER office in Bonn on secondment status. Thank you Mr. Chairman for giving us this opportunity.

The CHAIRMAN (*interpretation from Spanish*) I thank the delegate of Turkey.

Would any other delegation like to take the floor on this item?

I see no one wishing to take the floor so we can now consider that we have concluded our consideration of agenda item 7, report of the Scientific and Technical Subcommittee on the work of its forty-sixth session.

Ladies and gentlemen, distinguished delegates, I hope that we will also now be able to complete our consideration of agenda item 8, report of the Legal Subcommittee on its forty-eighth session, with a first statement on the part of Algeria. You have the floor.

Mr. A-S. KEDJAR (Algeria) (*interpretation from French*) Thank you very much Mr. Chairman. The Algerian delegation adheres to the principle that outer space must be, and must remain, a peaceful area to the benefit of humanity. Observation of the Earth from space has undoubtedly paved the way to a number of uses that have had positive impacts on sustainable development for a number of countries and

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regions. Nevertheless, high and very high resolution satellite data are placed at the disposal of the public without any kind of restriction or regulations being imposed. Unfortunately, among the general public and covered by certain freedoms, in the trade sense, there are also malevolent users, hostile organizations, using these data in order to plan, organize and carry out, violent actions which endanger the safety and security of populations and institutions and provoke the destabilization of entire regions.

Bearing in mind these specific situations, a number of regions which are linked notably to precarious security situations, the Algerian delegation believes that this subject is of extreme sensitivity and importance for the security and safety of populations.

To this end, we should like to propose that COPUOS, one of the principal concerns of which is to ensure the peaceful utilization of outer space, place this item on its agenda. Specifically, the Legal Subcommittee can propose regulations for the distribution and sale of high resolution data as well as for its presentation on the Internet. Thank you Mr. Chairman.

The CHAIRMAN (*interpretation from Spanish*) I thank the distinguished delegate of Algeria for his statement and the proposal that he has presented to us. Thank you very much.

Is there any other delegation wishing to take the floor on this item on our agenda this afternoon?

This seems not to be the case so we will now continue with our examination of item 9, spin-off benefits of space technology: review of current status. Actually, we will consider this tomorrow morning. Now, we will turn to item 12, space and climate change. Let me take up the list of speakers. The United States, Italy, Nigeria, India, Syria, Colombia, Malaysia and South Africa. I now give the floor to the United States.

Mr. J. HIGGINS (United States of America) Mr. Chairman, the United States commends the Committee for including this important topic on its agenda.

Satellite observations are truly an indispensable tool in the search for fundamental knowledge about the impact of society on our environment and the implications of global climate change for society. This is a grand challenge, defined as a major scientific thrust as compelling for both intellectual and practical reasons. Satellites with their unique perspective of the global integrated Earth system offer the potential for major breakthroughs.

The United States, in 1960, launched its first robotic mission to explore Earth's environment from space and continues to make significant strides in developing satellites and instruments. These systems provide a baseline of observations of the Earth's environment, such as global land use and land cover changes since 1972, Antarctic ozone hole since 1978, summer time depletion of Arctic sea-ice since 1978, total solar radius at the top of the atmosphere since 1978, global sea-level rise since 1992, global ocean phytoplankton abundancy since 1997 and Greenland and Antarctic ice sheet volumes since 2002.

The United States shares in the common global goal to understand Earth's changing climate, its interaction with life and how human activities affect the environment. These satellite observations have demonstrated that global warming is, without doubt, occurring. Global deforestation is proceeding rapidly, reducing the ability of our terrestrial biosphere to absorb carbon dioxide from the atmosphere. Because of global warming the recovery of the ozone hole over Antarctica is not happening as fast as anticipated when the Montreal protocol was developed.

The summer time sea-ice coverage in the Arctic has been dramatically reduced by warming ocean waters and by increased air temperatures and this is happening much faster than expected causing increased heating of the atmosphere. Well-calibrated high accuracy measurements of the Sun's energy incident upon the Earth's atmosphere reveal that the Sun is not a significant contributor to the recent rise in global surface air temperature. Global sea-levels rising at a much faster rate than anticipated, global marine life is being diminished by increased heating of the ocean from the atmosphere and by increased absorption of carbon dioxide from the atmosphere. The Greenland ice sheet is losing more mass each year than three times the total amount of ice occurring in the Alps. The melting of Greenland and mountain glaciers and the heating of the oceans are major reasons for global sea-level rise.

Many more examples exist of the Earth's changing climate observed from satellites. As a worthy testament of our collective science and technology endeavours, satellite observations are a primary source of scientific understanding of the Earth's changing environment and thereby form the foundation for subsequent actions by society.

Mr. Chairman, the United States presently operates 15 research satellites that provide high spatial and temporal resolution, high accuracy, well calibrated sustained observation of the land surface, oceans, atmosphere, ice sheets and biosphere. It is noteworthy that 9 of the 15 satellites have 13 international partners illustrating the value of cooperation in the peaceful use of space. Research satellites also serve society on a daily basis. Seven of the 15 satellites provide data for operational forecast, for air quality, harmful algae bloom and weather. The United States is now developing six research satellites for launch in the 2009-2014 period and two of these satellites will involve international partners.

The United States further operates two geostationary satellites and two polar orbiting environmental satellites devoted to improved weather forecast and it continues to infuse new technology for its next generation of operational geostationary and polar orbiting satellites. NASA develops new technology for satellite observing systems and the National Oceanic and Atmospheric Administration, or NOAA, maintains the operational system for atmosphere and ocean. Through a partnership with NASA and the US Geological Survey, or USGS, the United States operates landsat satellites for land use and land cover changes. We are proud of these highly successful programmes.

Working in partnership with other nations is a central precept of the US satellite observation strategy for weather and climate. US satellite observing activities contribute significantly to several international observing systems, principally sponsored by elements of the United Nations, such as the World Meteorological Organization, the Intergovernmental Oceanographic Commission and the Food and Agriculture Organization. The US continues its leadership role in the intergovernmental Group on Earth Observations, or GEO, and its development of the Global Earth Observation System of Systems, GEOSS.

GEOSS will be a comprehensive and coordinated system of observing systems through which satellite and other observations are intended to flow seamlessly to users. This is a challenging endeavour but one that promises great benefits to both developed and developing countries.

Mr. Chairman, the United States strongly supports the international Committee on Earth Observation Satellites, CEOS, and the CEOS virtual constellations initiative, which is a set of space and ground segment capabilities operating together in a coordinated manner. Current constellations are atmospheric composition, land surface imaging, ocean colour radiometry, ocean surface vector winds, surface vector winds and precipitation measurements. The US co-leads five of the seven constellations and, in addition, the US currently chairs the CEOS Strategic Implementation Team which plays a central role in the coordination of existing and future missions of CEOS agencies particularly to support GEO in its realization of the space segment of GEOSS.

The United States continues to demonstrate the immense value of satellites to observe the change in global climate and for developing new fundamental knowledge on the global integrated Earth system. The combination of satellite observations and increased understanding will improve international security, enhance economic prosperity, mitigate impacts of short-term and climate-related hazards and strengthen global stewardship of the environment. We will continue to work with the international community to enable comprehensive, coordinated and sustained Earth observation systems, for the benefit of humankind, today and into the future. To achieve this vision the United States offers the world access to data from its civil satellites with minimum time delay, minimum cost and maximum information contact, so that we all may observe and understand the global climate changes occurring yesterday, today and tomorrow. We encourage all countries to similarly implement an open and transparent data policy.

Mr. Chairman, today there is a growing understanding of the interactions among our planet's atmosphere, oceans, land and ecosystems. Through Earth observations we will be able to work together across all nations to understand, protect and enhance quality of life on our fragile home planet. Thank you.

The CHAIRMAN (*interpretation from Spanish*) Thank you to the delegate of the United States. Thank you for your statement under item 12, space and climate change. We shall now listen to the statement of Italy on the part of Ms. Simona di Ciaccio.

Ms. S. DI CIACCIO (Italy) Distinguished delegates, the Italian delegation welcomes the Indian proposal to include a new item entitled, space and climate change in the agenda.

Climate change is one of the greatest long-term challenges facing humankind in the twenty-first century. As confirmed by the G8 last environment meeting held in Syracuse, in April 2009, the climate change issue has to be ardently addressed. To this goal, it is fundamental to have a better knowledge of the

Earth's system through the collection of more data and improvement of modern techniques. In this context, space assets provide information that are essential for understanding, mitigating and adapting, to climate change. Satellites uniquely provide global and synoptic observation as well as uniformity, fast availability, ____(?) and continuity of data acquisition.

I would like to mention some missions in which Italy is involved that provide observation capabilities for climate research and monitoring and, in particular, for measuring the impacts of the effects of climate change on the environment.

Europe has started to develop an operational capacity to monitor the Earth's environment and security threats through the Global Monitoring for Environmental Security, GMES, which is also expected to be the main European contribution to the Global Earth Observation System of Systems. A very much sophisticated Earth observation satellite aimed at investigating the Earth's gravitational field with unprecedented resolution and accuracy has recently been launched.

GOCE, Gravity Field and Steady-State Ocean Circulation Explorer, is the first of a series of European Space Agency satellites dedicated to the exploration of the Earth. The objective of the mission is the realization of the first map of the Earth's gravitational field at the highest resolution. An accurate measure of the Earth's gravitational field will serve to improve the understanding of the oceans' currents which is a determining factor for the Earth's climate. The prime contractor is an Italian manufacturer.

Cosmo-SkyMed is proving a useful tool to this goal. The Italian Space Agency with the Cosmo-SkyMed satellite participates in a survey of the poles and the monitoring of Arctic ice. The study of glaciers and the poles is of extreme importance for climate change and their impact on the planet. With the antenna SAR X-band mounted on each of the satellites, Cosmo-SkyMed has been acquiring images over the area of the Wilkins Ice Shelf from March 2008 revealing the overall phenomenon of disintegration of the ice. In March 2009, a new consistent collapse occurred causing the break of the ice bridge located between the Charcot Island and the Antarctic peninsula. In April and May 2009 the phenomenon is going ahead and main cracks appeared also in the south between the Latady Island and the Antarctic peninsula.

The capacity to observe, under any weather conditions and both day and night, the flexibility of the system due to the use of radar sensors and the short time between two subsequent images of the same target make Cosmo-SkyMed a fundamental asset also for monitoring forest and woods. It supports the assessment of damage of woodland fires, keeping deforestation under control and studying bio-diversities. Indeed, the major problem in Earth observation by satellite is the equatorial location of the majority of the biggest fluvial forests. However, clouds are not a problem for SAR radar sensors which Cosmo-SkyMed is equipped with.

MioSat is an optical mission based on a micro-satellite with an electro-optic payload. The technological target is ____(?) to deepen the understanding of complex physical systems as the Earth through the employment of space and spectrum high resolution spectroscopy. It is capable of providing, in addition to the geometric image, the energy contents of the scenario observed. The mission will allow the collection and distribution of spectroscopy data including information on the quality of air, on geology, mineralogy, vegetation, volcanology, which may be applied to application research in the field of atmosphere physics and to physics of biological, biochemical processes of the land surface.

PRISMA (PRecursore IperSpettrale of the application mission) is an earth observation system with innovative electro-optical instrumentation which combines a hyperspectral sensor with a panchromatic, medium-resolution camera. There are precise advantages coming from this combination. In addition to the classical capability of observation based on the recognition of the geometrical characteristics of the scene, there is the one offered by hyperspectral sensors which can determine the chemical-physical composition of objects present on the scene. This offers the scientific community and users many applications, such as environmental monitoring, resource management, crop classification, pollution control.

Mr. Chairman, we would like to spend some words also for another Italian mission mainly dedicated to a better knowledge of climate change, specifically ROSA, Radio Occultation Sounder for Atmosphere. A premise is necessary, one of the main results of the reports of the International Panel of Climate Change, IPCC, is that the experimental evidence of the recent increasing of atmospheric temperature is correlated to an increasing of the content of water vapour in the troposphere and a decreasing of the stratospheric temperature. Due to the difficulties to measure the physical characteristics of the atmosphere in a global, precise and affordable way, it is necessary to develop

new techniques and instruments able to measure temperature, pressure and humidity of our atmosphere. The radio occultation technique is a very powerful tool for sounding the structure of atmosphere of our planet. This technique can provide accurate measurements of the atmospheric refractive indexes from which it is possible to derive atmospheric vertical profiles of temperature, pressure and humidity as well as profiles of the electron content in the ionosphere. The application of radio occultation technique to sound the Earth's atmosphere, make the presence of transmission sources like the satellite of GPS, Global Positioning System constellation.

The importance of the radio occultation applied to GPS measurements has increased during the last decade and the Italian instrument ROSA is an example of this. The radio occulation technique is based on the effects of interactions between the electromagnetic sequence emitted by the navigation satellite and the atmospheric layers crossed. ROSA uses the radio occultation technique to perform the vertical profile of atmospheric temperature, pressure and humidity as well as the profiles of the electron content in the ionosphere. The ROSA instrument is able to measure the atmospheric vertical profiles with very high resolution and high thermal accuracy and for this reason can be considered as a very precise global thermometer. The Italian Space Agency is working in collaboration with other space agencies for an exchange of their radio occultation data, in fact ROSA will be embarked on two satellites, the Indian satellite, OCEANSAT-2, which is planned to be launched in September 2009 and the Argentinean satellite, Aquarius/SAC-D, launch date 2010 or 2011. The information that radio occultation data can provide will be essential for the necessary consequence political decisions that have to be taken to tackle the vast consequences on the natural environment of the effects of climate change.

Mr. Chairman thank you for your attention.

The CHAIRMAN (*interpretation from Spanish*) We thank the distinguished delegate from Italy for their presentation. My next speaker is Mr. Otepola from Nigeria.

Mr. A. OTEPOLA (Nigeria) Thank you Mr. Chairman. As this is a new topic on the agenda of our Committee we would like to make very preliminary remarks especially regarding the interrelation between climate change and space science and technology.

On 18 May 2009, the Executive Secretary of the Economic Commission for Africa, the Ministers of Environment of Sweden and Rwanda made a joint statement in preparation for the Copenhagen meeting in December 2009 that would hopefully find a successive programme and protocol to Kyoto.

They referred to a fundamental unfairness interested in climate change where the poorest and most vulnerable countries, groups and people, who bear the least responsibility for climate change are, on the other hand, its worst victims. Here the reality is clear that we have passed the stage to apportion blame on climate change, who is and is not doing what, but urgently find ways to adapt and mitigate climate change. What we need now are measures to protect the environment, including the most vulnerable communities, against the vagaries of climate change as vacillation will make matters worse in terms of human suffering, health hazards, economic costs and destruction of the ecosystem.

We are also aware, Mr. Chairman, that one of the key objectives of the ongoing reforms in the United Nations to achieve system-wide coherence is to get agencies to act and deliver as one. In this spirit, we believe that COPUOS should actively contribute to the efforts to halt and reverse the negative effect of climate change. This can be done, we believe, if COPUOS works and collaborates with the United Nations Convention on Climate Change and also takes into account the work of the Intergovernmental Panel on Climate Change and, to this end, we would encourage the participation of these bodies in the future work of this Committee, specifically on the issue of space and climate change. But, on our part Mr. Chairman, we also further believe that COPUOS should contribute positively to the ongoing efforts by evolving ways and means through which space-based information can be deployed to mitigate the effects of climate change, including early warning systems. The future of every country will depend, to a large extent, on what it does now to address climate change especially if we understand and appreciate the nexus between climate change and the preservation of the environment for future generations. Thank you Mr. Chairman.

The CHAIRMAN (*interpretation from Spanish*) Let me thank the distinguished delegate of Nigeria for that statement and I now give the floor to the delegate from India, Ms. Ramachandran.

Ms. R. RAMACHANDRAN (India) Thank you Mr. Chairman. Mr. Chairman and distinguished delegates, the Indian delegation would like to place on record its appreciation to the Committee for including

this important agenda item and also thank the members that supported India in this initiative.

The Indian delegation also notes its appreciation that a symposium was organized during the forty-sixth session of the Scientific and Technical Subcommittee in February 2009 and the role of space technology in understanding and addressing the concerns of climate change. It will be noted that India participated in this symposium and made a presentation highlighting the status, in terms of initial tests and preliminary results, future plans and the need for integrating space-based and ground-based observation network.

Mr. Chairman, significant changes in the global climate system, apparent from the melting of snow cover, increasing global average temperature and associated rise in sea-levels are expected to cause irrecoverable loss to the planet Earth and ultimate threat to humanity. The ____(?) component in the climate change issue has become a cause of serious concern due to its impact on the Earth's radiation ____(?) and related implications on food production, water supply, health, energy, etc. Climate change is perhaps one of the most challenging issues ever to be addressed by the global community in general and the scientific community in particular.

Mr. Chairman, a broad consensus is presently emerging among the global scientific community and the possible impact of the changing climate, leaving major issues to be tackled urgently by humankind, present and future. To understand the vagaries of climate, space-based technology and applications have become crucial especially for retrieving the pertinent land, ocean and atmospheric data. Space provides a unique platform to monitor Earth system processes and satellite-based measurements can provide long-term data that can be accumulated in global climate models for predicting and monitoring long-term climate variabilities.

The Indian Earth Observation System consists of a constellation of geo, polar and low inclination orbiting satellites for providing data for mapping and monitoring ____(?) systems, detecting changes in atmospheric parameters on a temporary and spatial scale, and retrieving the land, ocean and atmosphere parameters for calibrating and validating the general circulation models.

Mr. Chairman, India has put forward concerted efforts to study and monitor climate change indicators that include, glacial retreat in the Himalayas, polar ice-cover change, shift in alpine vegetation ____(?) and leaching of coral reefs. Space-based observations for integrated existing global climate models to understand the current state with regard to this issue. India has also developed and commissioned ground-based observational network to provide ____(?) conditions for atmospheric models for accurate, global and regional weather predictions. These include the indigenously developed automatic weather stations, Agromet towers, doppler weather radars, Multi Wavelength Radiometer, ____(?) and GPS sonde. In addition, India has acquired multi-platform, multi-instrument capability for a comprehensive understanding of atmospheric compositions and also successfully carried out a few ship, air balloon ground-based scientific ____(?).

Mr. Chairman, India has plans to launch a series of Earth observation satellites such as OceanSat-2, INSAT-3D, Megha Tropiques, I-STAG and SARAL for acquiring data for global chain studies. These satellites will carry advanced payloads developed indigenously and also through international cooperation. India certainly looks forward to joining hands with member countries ____(?) in global climate modelling to evolve a unified approach to address the problem of climate change.

Mr. Chairman, in conclusion, the Indian delegation is confident that a great headway is possible with availability of high quality space-based Earth observation data in conjunction with ground-based observations to carry out research on climate change issues and also by translating these into socio-economic impacts that the countries and communities would have to deal with in future. The deliberations under this agenda item would certainly pave the way for a better understanding of the climate system and nurture several projects in international cooperation. Thank you Mr. Chairman.

The CHAIRMAN (*interpretation from Spanish*) Thank you very much India, we very appreciate the fact that it was your delegation that put this item on the agenda and that it had such great participation from other delegations.

Syria is next on my list, you have the floor.

Mr. O. AMMAR (Syrian Arab Republic) (*interpretation from Arabic*) Thank you Mr. Chairman. I hope you will be patient enough to listen to what I will have to say.

There is no doubt that the phenomena resulting from climate change are increasing globally in general as well as in our region in particular. Many of these phenomena have exacerbated in our region, or

appeared, whether with regard to low precipitation or no water or desertification or drought or sandstorms as well as other phenomena which, year after year, are exacerbating in our area. We are convinced and we know that these phenomena are global and must be addressed globally, or at least regionally, when there is a way to address them in a harmonious way and in conformity with addressing them globally. Therefore we have cooperated with some neighbouring countries who share some of these problems.

We have set up projects, carried out studies, in order to study those phenomena and in order to reduce them. We have thus set up projects to study the vegetation cover, desertification control, sandstorms, dust storms or studies related to the degradation of land, in cooperation with some countries in the region such as Algeria, Libya, Egypt and Iran. I would like therefore to thank and greet all competent authorities in those countries which have cooperated and shown a sense of responsibility in cooperating with us in addressing those phenomena.

We try to fight those phenomena with limited resources, we often lack those resources although we suffer from these phenomena and we do not provoke them, we do not cause them. The damage is double.

First when the phenomena occurs and secondly when we have to devote resources to acquire techniques that would help us in addressing those phenomena. Therefore, I think that we should be very serious in addressing those problems. Of course there are countries that contribute to greenhouse gases, to the increasing of Earth's temperature or contribute to pollution and they own remote sensing techniques, they own satellites, whereas we suffer from those phenomena and we do not influence them, we just face them with our limited resources. We hear nice words, calls to cooperate, but have we been honest towards ourselves and ____(?) seriously, have we requested those countries, for instance, to pay in part for those phenomena to help our countries with limited resources to face those phenomena.

We should think in a practical way, for instance, OOSA could be a focal point between those owning those techniques and those suffering from these phenomena who cannot face them alone. Countries who pollute and own those techniques could play a part in addressing global phenomenon, which they caused and aggravated to begin with. There should be perhaps a data bank, a satellite images bank, so that OOSA could help those countries in implementing projects related to the study of this phenomenon and the reduction of that phenomenon in our region or any other region in the world. I wish we could take a practical step to not only talk of theoretical cooperation but rather practical cooperation in order to face those phenomena together. Thank you.

The CHAIRMAN (*interpretation from Spanish*) Let me thank the distinguished delegate from Syria for those words, I am sure that OOSA is doing all it can to ensure practical cooperation in this respect.

I now give the floor to Colombia.

Mr. I. GÓMEZ GUZMÁN (Colombia) (*interpretation from Spanish*) Mr. Chairman, good afternoon. Climate change is indeed affecting many countries of the world and it is space technology which can be seen as a tool to fight this phenomena which is adversely affecting everyone.

As far as climate change is concerned, Colombia is currently a part of the UNFCCC, the Framework Convention, and we have also signed and ratified the Kyoto Protocol. In Colombia, we have developed a political ____(?) institutional framework to coordinate this effort. As a part of the Convention, in 2001 we held the first national climate change convention, this was led by IDEAM with participation of over 70 public and private institutions.

We have also developed a national climate change policy as well as a comprehensive national action plan. This includes studies on vulnerability, adaptation and mitigation of climate change. Part of these national objectives include the development of detailed studies on the vulnerability of islands and high altitude mountains, this for the year 2010.

We have also developed these kinds of studies for other ecosystems in mountainous regions as well as for the agricultural field and the health field which will run through 2019. We also seek to benefit from the opportunities offered by the different international agreements on climate change by drawing up projects that employ cleaner technologies for production.

The Colombian satellite programme, run by our space agency with different entities and sectors of the country, has marked climate change as one of the 36 areas for the application of technology, such as remote satellite sensing which are priorities for Colombia and whose use we want to increase. The different bodies that are part of the Colombian space agency working in this field and which incorporate geospatial technologies are all working on climate change topics.

We are currently looking at projects dealing with the rise in sea-level on the coastline of the country using data coming from Earth observation satellites and GPS. This is all lead by the Agustín Codazzi Geographical Institute, IGAC and DIMAR.

The Ibero-American monitoring network for forest ecosystems faced with global climate change is working with different governmental entities as well as academics from Spain, Mexico, Ecuador, Bolivia and Argentina to develop modelling methodologies for different source data. This would allow us to determine the effect of climate change on tropical forests, Andean forests, Amazonian forests and, in the Caribbean region. These tools will allow us to plan for mitigation and adaptation of our strategic ecosystems on a national level and with the economic support of international entities.

In 2006, we drew up our comprehensive pilot plan for adaptation to climate change. This is in order to produce programmes for adaptation to meet the effects of climate change in the mountainous regions, in the Colombian/Caribbean islands as well as the effect on human health. Non-governmental organizations and other State entities are involved in this effort and they all use data that come from remote sensing in order to diagnose, analyse and take appropriate measures for the prevention and mitigation of climate change.

Mr. Chairman, this is a very short report on what we are doing in Colombia using space technology in order to help the world, as a whole, fight the ill-effects of climate change. Thank you.

The CHAIRMAN (*interpretation from Spanish*) Thank you very much. The gentleman who spoke is the Executive Director of the Colombian Space Commission and who, tomorrow, we will have the pleasure of hearing during a presentation of the work of that body. Thank you very much.

Pakistan asked for the floor.

Mr. I. IQBAL (Pakistan) Thank you Mr. Chairman. Climate change is having an effect on water security in Pakistan for agriculture and other purposes. The Pakistan delegation expect OOSA to play a more pro-active role in addressing this issue through carrying out advisory, advocacy and acting as a bridge between nations to carry out collaborative projects to assess the effects of climate change in countries who do not have the technological capability to do so on their own. Thank you.

The CHAIRMAN (*interpretation from Spanish*) I thank the representative of Pakistan for his intervention.

I now give the floor to Malaysia.

Mr. M. MASTOR (Malaysia) Thank you Mr. Chairman, ladies and gentlemen.

With regard to the climate change issue, the Malaysian Meteorological Department, MMD, has included the collection and better usage from satellites in the World Meteorological Organization's World Weather Watch System through various supply data reception systems, in addition to the surface and upper air network observation stations, ____(?) observing stations and other specialized networks and facilities such as radar, lightning detection, solar ____(?) radiation and other monitoring facilities.

This satellite information enables the Malaysian Meteorological Department to monitor day-to-day weather conditions and, in the longer term, climate change over the country and the region. Several different types of satellite images are made available from the satellite data reception systems installed by the Department. We have provided cloud cover imageries and other derived parameters, such as winds and temperature profile from both geostationary and polar orbit satellites. In addition, satellite data have also provided essential input to the numerical modelling run by the Department both for numerical weather prediction and regional climate change modelling. In terms of climate change model simulations, the Malaysian Meteorological Department has used vegetation and topography data derived from satellite for the ancillary data input. Thank you.

The CHAIRMAN (*interpretation from Spanish*) Thank you very much to the delegate of Malaysia.

I now give the floor to the representative of South Africa, Mr. Martinez.

Mr. P. MARTINEZ (South Africa) Mr. Chairman, the recognition or acceptance of unprecedented global climate change is currently at a crossroad. On the one hand, some politicians and economists are calling for more evidence given that mitigation activities are believed to reduce economic activity and hence economic growth. On the other hand, the scientific community is convinced that climate change is real and that the cost of no action far exceeds the cost of early mitigation and intervention. Central to this debate is the knowledge and

understanding that the rate of depletion of existing resources as a function of human activity and the adverse affect this has on the ____(?) of the environment.

It is widely recognized that Africa contributes the least in terms of global carbon dioxide gas emissions, the prime catalyst in the greenhouse effect. The projected impacts of global climate change for Africa is compounded by a host of socio-economic factors which include high population growth, widespread poverty, disease burden, inequitable land distribution and use, recurrent droughts and an over-dependence on rain-fed agriculture.

Secondary factors that serve to exacerbate the problem include a generally weak science and technology infrastructure that limits the rate at which adaptive research can be performed and implemented. ____(?) are often under-funded and under-capacitated. Armed conflicts weaken the ability to respond to climate change and, in fact, add large refugee populations to the local populations which places an additional strain on the environment.

Chairperson, the Millennium Development Goals, adopted at the World Summit on Sustainable Development in September 2000, provided an important prescription for a new global partnership to ensure the well-being of humans and the environment. It is interesting to note that one of the Millennium Development Goals is to ensure environmental sustainability. The 2007 update report acknowledges the effects of climate change which is purported to make achievements of the Millennium Development Goals more difficult. The year 2007 marked the mid-point between the adoption of the Millennium Development Goals in 2000 and the target date of 2015 yet sub-Saharan Africa is not on track to reaching any of these goals.

Chairperson, as environmental issues are global in scope and cross international boundaries satellite remote sensing is the only source of data that provides a global perspective that is consistent with the scale of the issues being investigated, particularly for climate change studies and observations. Operational remote sensing has evolved to the stage where end-users can obtain archived imagery of any desired geographic area within a relatively short time ranging from a few hours to a few weeks. This principle of archiving satellite imagery and using it downstream for environmental and resources analysis and management is not unique. In fact, it forms the basic foundation for many Earth observation systems including the Global Observation System of Systems and its South African implementation, the South African Earth Observation Strategy which is due to be initiated by the end of 2009.

The objective of the South African Earth Observation Strategy is to coordinate the collection, assimilation and dissemination of Earth observations so that their full potential to support economic growth and sustainable development in South Africa can be realized. We look forward to reporting on the contributions of the South African Earth Observation Strategy to addressing the issue of climate change in southern Africa in future sessions of this Committee. Thank you Mr. Chairman.

The CHAIRMAN (*interpretation from Spanish*) I should like to thank Peter Martinez for this presentation especially as regards the strategic use of the satellite image archives which certainly facilitates our work in fighting this problem, especially in Africa, so I thank Dr. Martinez for his presentation.

Mr. M. TARABZOUNI (Saudi Arabia) (*interpretation from Arabic*) Thank you Sir. Climate change is an extremely important issue for my country especially when it affects the life of citizens. It is reflected in different manifestations such as scarcity of rainfall, the increase in sandstorms frequency as well as desertification, are among those manifestations. This is extremely costly for my country, that is why we are calling for the cooperation to be in the field, to be practical, and not theoretical or hypothetical. Cooperation, referred to by my brother from Syria, is limited so far because many of the countries he has mentioned in his statement are unable to obtain the technologies nor the financial support they need. That is why we call upon COPUOS and the international organizations and the regional organizations to allocate funds that would contribute to finding solutions to limit and mitigate this climate change phenomenon, since it is a global one.

The CHAIRMAN (*interpretation from Spanish*) Thank you to the representative of Saudi Arabia for this statement.

I have no other request for the floor on the part of a member State so I will now give the floor to the representative of GEO.

Mr. G. RUM (Group on Earth Observations (GEO)) Thank you Mr. Chairman, distinguished delegates, ladies and gentlemen, it is a pleasure for me to report on the approach, activities and initial achievements on the Group on Earth Observation, GEO, concerning climate.

GEOSS, the Global Earth Observation System of Systems, is being implemented to improve the use of environmental information in decision-making within a number of domains. Nine of them were identified as the so-called Societal Benefit Areas, SBAs, to be considered as reference for action. They are disasters, health, energy, weather, climate, ecosystems, agriculture and biodiversity. The key words for GEOSS definition and implementation are synergy, interoperability, operational sustainability, inter-disciplinarity and cross-cutting nature. The latter being based on the fact that our climate is a complex system with highly inter-correlated features.

Climate is probably the best example to explain the approach taken. In fact, the observations and derived information that are the basis for climate variability in change understanding, for achieving mitigation of the effects and for defining and implementing adaptation measures, they really constitute the cross-cutting dimension of GEOSS. The benefits expected from the use of improved and sustained climate observations, modelling and data sets are spread to all Societal Benefit Areas and are relevant to a vast range of user communities. Building on the existing action, such as those of the Global Climate Observing System, GCOS, and of the World Climate Research Programme, WCRP, GEO is consolidating its role as the common framework among the key players in the climate domain.

The GEO work plan for 2009-2011 includes the necessary task to address the main issues, to produce and ensure optimum use of improved climate data sets. In fact we deal with producing climate records for assessing variability change, producing environmental information for decision-making with management and adaptation, global carbon observation and analysis system development and sustained observing systems.

You will not be surprised to hear that the increased use of satellites has allowed huge advances in modelling and that satellite-derived data constitute the majority of observations being used by the climate community even if we must recognize that *in situ* observations are the essential complement. A number of users are expected to take benefit from these activities. Provide the science and research community with a sustained stream of reliable observations is the basis for any further step in the domain of the end-users, such as the United Nations that constitute a very good example.

Climate-related data sets will not only support UNFCCC, the United Nations Framework Convention on Climate Change but also will provide basic data to implement other UN frameworks like the one on biodiversity and the one on combating desertification and also with help achieving the Millennium Development Goals.

Important achievements have been made and re-processing is playing an important role in creating an historical series of improved climate-related information but, most important, it was possible to coordinate different efforts to relay synergies, to share databases and make them available to teams worldwide. Thank you very much for your attention.

The CHAIRMAN (*interpretation from Spanish*) Thank you to the delegation from GEO, under space and climate change, item 12. Following this item we shall now turn our attention to item 13, use of space technology in the United Nations system.

Mr. F. PISANO (United Nations Institute for Training and Research (UNITAR)) On behalf of the United Nations Institute for Training and Research and its operational satellite applications programme, I am honoured to provide you with a report on the Interagency Meeting on Outer Space Activities and its twenty-ninth session held in Geneva from 4-6 March 2009.

Distinguished delegates, the United Nations Interagency Meeting on Outer Space Activities serves as the focal point for interagency coordination cooperation in space-related activities. This year, the twenty-ninth session of the interagency meeting was hosted by the United Nations Office for Outer Space Affairs and gathered representatives from eight United Nations entities in Vienna from 4-6 March, as I said before.

The interagency meeting reviewed and approved the report on the work of the interagency meeting and the Secretary-General report on the coordination of space-related activities within the United Nations system. Both reports are now before the Committee and I will briefly report on the highlights of this year's meeting.

At the beginning of the session the representatives from participating United Nations entities reported on their activities and plans for 2009 and 2010 emphasizing those activities requiring, or benefiting from, interagency coordination and cooperation. The members of the interagency meeting were briefed on the work of the Committee on the Peaceful Uses of Outer Space and its subsidiary bodies with special attention given to matters relating to interagency coordination. In this context, the

interagency meeting welcomed the new agenda item on the use of space technology in the United Nations system which provides an avenue for reporting on activities to the Committee. The meeting agreed that the following key issues, identified at this session of 2008, remain valid.

1. Strengthening further the interagency meeting as the United Nations central mechanism for coordination of space-related activities.

2. Reinforcing the contributions made by the United Nations entities to the implementation of the United Nations Spatial Data Infrastructure, UNSDI, implemented by the United Nations Geographic Information Working Group.

3. Enhancing the use of space-based assets in support of disaster management.

4. Reinforcing the contributions made by the United Nations entities to the Global Earth Observation System of Systems, GEOSS, and the Group on Earth Observation, GEO and making optimal use of the systems' potential to strengthen the capacity of the United Nations itself.

The meeting noted that the United Nations entities continued to actively contribute to the protection of the Earth environment and the management of natural resources through the operation of global observing systems that rely on space-based data. Activities of the United Nations in the fields of human security and welfare, humanitarian assistance, and disaster management, benefit increasingly from the use of space technology and its applications.

It was also noted that several United Nations entities conduct a range of programmes that support capacity-building, training and education in the area of space-related activities. At its session of 2008, the meeting had decided to review the space-related activities of United Nations entities in Africa. To follow-up on that decision, the interagency meeting endorsed this year a draft report on the theme: the use of space technology for sustainable development in Africa. The draft report was prepared by the Office of Outer Space Affairs in coordination with the United Nations Economic Commission for Africa and in consultation with other United Nations entities. The report is now before this Committee as CRP.4. It will be presented to the Third African Leadership Conference on Space Science and Technology for Sustainable Development to be held in Algeria in late 2009. This report may also be submitted to the Commission on Sustainable Development for this work under the thematic cluster 2010 and 2011.

Sustainable development in Africa is an overall cross-cutting theme for this multi-year work plan of the Commission and its consideration would benefit from this particular report. ____(?) the traditional open informal session of the interagency meeting was held in the afternoon of 6 March. Representatives from 13 member States attended the open informal session where an interactive discussion on the theme of space-related activities of the United Nations in Africa took place with United Nations entities participating in the interagency meeting.

The Office for Outer Space Affairs presented its activities contributing to capacity-building in the use of space technology and its applications in Africa. The International Telecommunication Union reported on the Connect Africa Summit and its follow-up activities. The United Nations Office on Drugs and Crime demonstrated its use of remote sensing tools for illicit crop monitoring in Africa. Applications of geographic information systems using space-derived geospatial data support currently the operations of the United Nations High Commissioner for Refugees, in Africa also. The United Nations Educational, Scientific and Cultural Organization, UNESCO, is engaged in capacity-building activities for water resources management in Africa, while the World Meteorological Organization is contributing to capacity-building in the use of space-derived data for meteorological applications.

The presentations made at the interagency meeting and the open informal session as well as the reports ____(?) the information on the current space-related activities of United Nations entities are available on the website dedicated to the coordination of outer space activities within the United Nations system.

Distinguished delegates, the discussions at the interagency meeting continued to demonstrate the extent to which the United Nations entities are promoting the use of space technology and applications by contributing to capacity-building efforts. The discussions also show the extent to which the work of the United Nations itself is benefiting from space-based solutions.

In concluding, I would like to inform the Committee that the thirtieth session of the interagency meeting will be hosted by the International Telecommunication Union in Geneva from 10-12 March 2010. The theme of the open informal session

attached to that meeting, to be held in the afternoon of 12 March, will be space technology for emergency communications.

I would like to take this opportunity to extend an invitation to all members and permanent observers of the Committee to this open informal session. This concludes my report, Mr. Chairman, I thank you for your attention.

The CHAIRMAN (*interpretation from Spanish*) I thank Francesco Pisano for having given us this presentation on the interagency meeting. He was speaking as a representative of UNITAR. This, of course, is a very important subject for our Committee and this has been an issue of concern, on the part of our representatives, for a very long time. The issue of more effective coordination between the various UN bodies dealing with outer space, of course bearing in mind the mandates of each body or institution involved, for some of these, outer space is a marginal issue and for others it is a central one.

It is very good to see that each time these meetings are held, these interagency meetings, there is a possibility for member States to participate and to see the participation of other institutions which are involved and are not present here in our Committee. So you said quite well that the use of space technology in the United Nations system is a very important topic for us, so thank you again for your presentation.

We will now re-open item 7 on our agenda since the French delegation will present the state of its proposal to us following the negotiations, which will be concluded this afternoon. You have the floor Mr. Brachet.

Mr. G. BRACHET (France) (*interpretation from French*) Thank you very much Mr. Chairman. It is my pleasure to inform you that, consultations held with numerous delegations concerning the French proposal of the inclusion on the STSC in 2010, a new agenda item entitled: long term sustainability of outer space activities. While these consultations reached an agreement on the draft conclusion which can now be included in the Committee's report under item 7 of the agenda. I believe that the text of this conclusion has been distributed by the Secretariat. Perhaps we can ask the Secretariat just to check, one final time, the style but, following the Secretariat's work on the style, I would hope that the conclusions, as they are here, will be included in the Committee's report when it comes to approval of their final report on Friday.

Let me take this opportunity, Mr. Chairman, to express my heartfelt thanks to the many delegations who participated in these consultations and who made constructive contributions, positive contributions, and all created a very constructive working spirit which is auspicious for beginning of this work over the coming years by the STSC and then, in plenary, on this important issue of the long-term sustainability of outer space activities. I thank you Mr. Chairman.

The CHAIRMAN (*interpretation from Spanish*) Thank you very much Mr. Brachet. I am very pleased to see the positive outcome of these consultations and of course my thanks go to the French delegation for the ongoing efforts that they have made to express the concerns of the house as a whole and, as we said, we will ask the Secretariat to, at this time, introduce the proposed text, maybe reading it out. You have the floor Secretariat.

The French delegation asked the Secretariat to read the proposal and that is the only thing remaining to be done, so I ask the Secretariat to read the text, in other words, the results of the consultation.

Mr. G. BRACHET (France) (*interpretation from French*) Mr. Chairman, I am suggesting that the Secretariat look at the style internally before it is proposed for general approval when you come to that during the final report approval on Friday.

The CHAIRMAN (*interpretation from Spanish*) Well, the Chair thinks, Mr. Brachet, that it is a good idea to read the text out *in extenso* because this entails certain changes and I think it is worthwhile for the house here to have a clear vision of this text, so if you do not disagree I will ask the Secretariat to read it out at this time.

Mr. N. HEDMAN (Secretariat) Thank you Mr. Chairman. Yes, the Secretariat will do so.

Paragraph 1. The Committee agreed that the Scientific and Technical Subcommittee should include a new agenda item entitled: long-term sustainability of outer space activities under a multi-year work plan for its forty-seventh session to be held in February 2010.

Paragraph 2. After having taken into account contributions from many delegations, the multi-year work plan could be as follows.

2010. General exchange of views in the Scientific and Technical Subcommittee on present and future challenges facing outer space activities as well as potential measures that could enhance the long-term

sustainability of outer space activities with a view to establish a working group open to all member States of COPUOS.

2011. Preparation of a report on long-term sustainability of outer space activities and examination of measures that could enhance the long-term sustainability of outer space activities. Preparation of a draft set of best practices guidelines.

2012-2013. Continuation of consideration and finalization of the report and of the set of best practices guidelines for presentation to, and review by, the Committee.

Paragraph 3. The Committee would consider whether the set of best practices guidelines should require review by the Legal Subcommittee before it is endorsed. The Committee, once the set of best practices guidelines have been endorsed, may also consider the best practices guidelines should appear as an annex to a specific General Assembly resolution or should simply be endorsed by the Assembly as part of the annual resolution on international cooperation in the peaceful uses of outer space.

Thank you.

The CHAIRMAN (*interpretation from Spanish*) Let me thank the Secretariat for kindly reading out the text which we have only in English at this time and reading for the benefit of those who do not have English. This is therefore submitted to you for your consideration. Again, the result of a series of consultations which were expressed just a few moments ago.

I see no observations from the house so this shall be included within the report of the Scientific and Technical Subcommittee.

The United States has asked for the floor.

Mr. K. HODGKINS (United States of America) Thank you Mr. Chairman. My delegation certainly appreciates the effort that our colleagues from France have put into this initiative. We do not have any real objections, however, I do have one question, it is more procedural.

In paragraph 2, it says the multi-year work plan could be as follows. Now, have we agreed to a multi-year work plan? Or is this just an example of a work plan that could be as follows and that we are still going to be deciding on what the work plan looks like next year or the year after? I think we have to be definitive here. We agree to the work plan or we do not agree to the work plan. But, at least in English, could is conditional and means that this is not a definitive work plan. Perhaps we could get some clarification on that. Thank you.

The CHAIRMAN (*interpretation from Spanish*) Thank you. Let me give the floor to France.

Mr. G. BRACHET (France) (*interpretation from French*) Thank you Chair. It is always a bit embarrassing to have to answer a question on a matter of grammar which is not in your own language.

In fact, the discussion we had during those consultations showed that there was an agreement on the work plan but we had to be a little bit flexible in the Scientific and Technical Subcommittee who will give the mandate to that working group. That is why the word ‘could’ was inserted. That was the idea to give a little bit of flexibility and maybe ‘could’ is not the most appropriate word but the idea was to have this work plan that could be somewhat adjusted given to the Scientific and Technical Subcommittee.

The CHAIRMAN (*interpretation from Spanish*) Thank you France. Does that satisfy the United States? It seems.

Czech Republic.

Mr. V. KOPAL (Czech Republic) Thank you Mr. Chairman. I would like to first to say that I fully agree with this text and I participated in the discussion on it.

I have only a very, very, minor language question. In the last paragraph, it is said ‘the Committee, once the set of best practices guidelines have been endorsed, may also consider’ and now I would insert the word ‘whether’, ‘whether the best practices guidelines should appear as an annex to a specific General Assembly resolution or should simply be endorsed by the Assembly’ because otherwise the language is somehow unusual.

The CHAIRMAN (*interpretation from Spanish*) Let me thank the distinguished representative of the Czech Republic. This does, I think, improve the text and is I think grammatically acceptable.

Any other delegations?

Mr. Y. XU (China) Thank you Mr. Chairman. Very briefly, just to follow Mr. Kopal's suggestion that we want to make improvement of the last paragraph of this draft report. 'The Committee, once the set of best practices guidelines have been endorsed', we would like to change into 'The Committee once endorsed the set of best practices guidelines may also consider whether'. Another issue is on the second last line of this last paragraph 'endorsed by the Assembly' maybe we should mention 'endorsed by the General Assembly'. Thank you Mr. Chair.

The CHAIRMAN (*interpretation from Spanish*) Thank you. Indeed, I think this also improves the text. For us it is understood that this is the General Assembly but that may not be clear for everyone so I think that is acceptable.

There are no other delegations wishing to speak out?

Mr. J. FILHO (Brazil) (*interpretation from Spanish*) Sorry, Mr. Chairman. I just wanted to be sure about the changes. Could you please repeat how the final text reads now?

The CHAIRMAN (*interpretation from Spanish*) The Secretariat has the floor.

Mr. N. HEDMAN (Secretariat) Thank you Mr. Chairman. Instead of reading it out now the Secretariat will take this back, check it with the Editorial Section and then provide it in a conference room paper for your consideration, on the language issues.

The CHAIRMAN (*interpretation from Spanish*) Then we will accept this with the idea that there are a few stylistic changes and not substantive changes here and the Secretariat will provide us with a clean copy and, on that basis, we can adopt the proposal from France.

I have a request from the UNESCO representative, Yolande Berenguer, who wants to take the floor because she has been called to duty outside Vienna and wishes to speak now. You have the floor Madam.

Ms. Y. BERENGUER (UNESCO) Thank you Mr. Chairman for giving me the floor to present the activities of UNESCO under the new agenda item, use of space technology in the United Nations system.

Yesterday, 8 June, was the UN World Oceans Day and an exhibition of photos of selected underwater cultural heritage sites can be seen this week in the lobby of the main building of UNESCO.

Mr. Chairman, approximately 74 per cent of the Earth's surface, an area of 36 million kilometres, is covered by water. Oceans are a major part of the planet's life support system, it produces between one-third and one-half of the world's oxygen and absorbs ____(?) carbon dioxide. Oceans are home to the thousands of species of fish, invertebrates and marine mammals and provide an important part of the global food chain.

The Intergovernmental Oceanographic Commission of UNESCO, IOC, promotes international cooperation and coordinates programmes in research in ocean sciences, services, observations, data management and related activities including transfer of technology and capacity-building to address the following issues. Prevention and reduction of impacts of coastal and oceanic natural hazards, mainly hurricanes, tsunami, storm surge, the mitigation of impacts and adaptation to climate change variability, the safeguard of the health of ocean ecosystems, the further development of research and monitoring requirements for the prevention of marine environmental degradation and maintenance of bio-diversity and sustainable number of marine habitats and the management procedures and policies leading to the sustainability of coastal and ocean environments.

Furthermore, IOC coordinated development of tsunami early warning system and mitigation systems in the Pacific Ocean, Indian Ocean, north-eastern Atlantic, Mediterranean and the Caribbean. IOC leads the Global Ocean Observing System, otherwise known as GOOS, which is an international programme focused on the sustained collection of ocean observations and the timely distribution of its data and derived products, including analysis, forecasts and assessments. Together with WMO, Global Ocean Observing System is designed to monitor, understand and predict weather and climate, describe and forecast state of the oceans, including living resources, improve management of marine and coastal ecosystems and resources and enable scientific research.

GOOS has regional alliances as well as activities but I would like to mention in particular the GOOS Africa project because Africa is a priority region of UNESCO. The African continent can be impacted by extreme events such as El Niño, and La Niña, which affect rainfall and crops, as well as by floods, drought and tropical cyclones. Ocean processes

can affect economic values of African investments in shipping and trading, offshore and coastal mining and fisheries, seaside tourism, management of coastal zone and large marine ecosystems, public safety, health and protection of properties and early warning system. The multidisciplinary approach of GOOS Africa, which collects information on the terrestrial, oceanic and atmospheric processes through assessment, hindcasting, predicting and forecasting, and establishment of early warning systems provide information on potential floods, sea level rise, regime shifts and their impacts on ecosystems and people dependent on them.

The other agencies that are leading or contributing to the Global Earth Observing System are WMO, which is leading the Global Climate Observing System or otherwise known as GCOS, and FAO which is leading the Global Terrestrial Observing System otherwise known as GTOS, together with UNEP. ICSA is also a partner in this Global Observing System. These observing systems are initiated to have an improved understanding of the Earth's system which are essential to predict and respond to expected global changes and impacts of human civilization.

In 1998, this global observing system and the international agencies which sponsor these systems, WMO, FAO, UNESCO and its IAC, UNEP and ICSU, the International Council for Science, together with other partners, found an Integrated Global Observing Strategy called IGOS in order to address how well user requirements are being met by the existing mix of observations including those of the global observing systems and how they could be met in the future through better integration and optimization of remote sensing and ____(?) systems as well as it would serve as a guidance to those responsible for defining and implementing individual observing systems.

As one will note these objectives are the same as that of the Group on Earth Observations, GEO, therefore in order to avoid duplication and to maximize all potentials, it was decided to transfer IGOS to GEO in 2007. 2008 was a transition phase and this year, in conjunction with the GEO sixth plenary which will be held in November 2009 in Washington, D.C,. a GEO-IGOS symposium will be held to discuss the way forward.

Another programme of UNESCO is a tidal programme in Africa which is the result of the recommendation during the World Summit on Sustainable Development held in Johannesburg in 2002. The recommendation said that there is a need to assist African countries to overcome problems facing the collection, analysis and dissemination of water-related ____(?) information by exploiting the advantages of Earth observation technology. This programme has three stages.

The research stage, which is focused on training a critical mass of technical centres in Africa with the skills and capabilities to derive and disseminate space-based water-relevant information to water authorities. Fifty projects distributed all around the African continent were selected with a focus on study areas located in some 28 different geographic areas of interest. The research topics included, flood mapping, hydrology, water quality, wetlands mapping, land cover and land-use mapping.

The second stage of TIGER was the pre-operational stage aimed at developing and demonstrating Earth observation based information services and systems to support African water authorities in collecting water-relevant information. Sixteen developments and demonstration projects were carried out by the European Space Agency and the Canadian Space Agency with more than 30 African water authorities and technical consortia involving African, European and Canadian companies and technical centres. The other investments by ESA and the Canadian Space Agency was 6 million Euros. The project developed Earth observation based weather information services adapted for the specific user needs and demonstrated the role applicability in Africa which resulted in a solid portfolio of potential operational services ready to be transferable from a pre-operational stage to a full operational level.

The third stage is the operational stage which is ongoing right now, there are ongoing calls for proposals. The TIGER Secretariat was held in UNESCO's Nairobi office and UNESCO provided access to its worldwide network of hydrologists in the framework of the international hydrological programme. This contribution will be continued in the next phase of the TIGER programme.

As mentioned this morning and this afternoon by several delegates, climate is at the top of the United Nations agenda. Governments are discussing and negotiating the conditions of climate regime beyond 2012 under the UN Framework on Climate Change. The key milestones ____(?), critical for the future of the climate, included the UNFCCC conferences in Bali in 2007, in Poznán in 2008, and the forthcoming one in Copenhagen in December 2009.

The whole UN system is supporting this process and UNESCO is playing its part. The Secretary-

General, Ban Ki-Moon, has designated UNESCO as convener, along with WMO, for the cross-cutting area of climate knowledge which includes science, assessment, monitoring and early warning. Earth observation will play a major role in enhancing and furthering climate knowledge.

On 27-29 July 2009, UNESCO is holding an international seminar on climate change education which will focus on the role of education, addressing climate change, linking the local, regional and global context with particular emphasis on the challenges faced by small island developing States.

An open agreement with space agencies namely, the European Space Agency, French Space Agency, DLR and JAXA have been signed for the monitoring and preservation of world heritage sites. Projects are ongoing and will be implemented in different sites that have been selected by this agency.

Mr. Chairman, aside from being part of the interagency coordination and planning committee to GEO, UNESCO is also a participating organization of GEO. It is a member of the Science and Technology Committee and a co-chair of the capacity-building committee. The GEO envisions the future where Earth observation capacity-building efforts are coordinated and the access to, and availability of, the capacity-building programmes to users in all of GEO's Societal Benefit Areas are enhanced.

One of the projects of capacity-building committee is to produce a capacity-building road map until 2015 and, in the framework of GEO, UNESCO is contributing within the framework of the GARS programme, the Geological Applications of Remote Sensing, which is using remote sensing technology for the better monitoring natural hazards of geological origin, such as earthquakes, volcanic eruptions, landslides and land subsidence. This programme is contributing to UNSPIDER and to the GEO ____(?).

Lastly, UNESCO implements the space education programme which enhances space-related studies in the classroom and its integration in the curricula but I will expand more on this programme tomorrow when we discuss agenda item 12 on space and society. Thank you Mr. Chairman.

The CHAIRMAN (*interpretation from Spanish*) I would like to thank the representative of UNESCO. It is always a great pleasure for us to listen to your comments and to see the close relationship between our Committee and UNESCO. What you said this afternoon will be added to tomorrow when you discuss education.

I would like now to give the floor to Brigadier General Susan Helms of the United States Strategic Command who will make a presentation entitled: Iridium/Cosmos satellite collision. As delegates may know, General Helms is also a veteran astronaut who has spent over 200 days in orbit. Among her many accomplishments she was part of the International Space Station's Expedition 2 crew. She holds the world record for the longest space walk in history, nearly nine hours, which she performed during her stay aboard the Space Station.

Ms. S. HELMS (United States of America) Thank you Mr. Chairman. Today I am pleased to represent the United States at this important forum addressing international cooperation regarding the peaceful use of space for all users.

This afternoon I would like to address our view on the February 2009 collision between an Iridium communications satellite and a non-operational Cosmos satellite and describe the insight we have gained from this event.

I will also discuss the current measures we have in place, the steps we have taken to improve our future capabilities and how international cooperation between space faring nations can lead to improved space situational awareness.

Before I address these topics, I would like to first highlight a few of our guiding principles of our national space policy. The United States remains committed to the exploration and use of space by all nations for peaceful purposes and for the benefit of all humanity. The United States rejects any claims to sovereignty by any nation over outer space or celestial bodies or any portion thereof and rejects any limitation on the fundamental right of all nations to operate peacefully in and acquire data from space.

A collision in space threatens every nation's ability to explore and use space for peaceful purposes and so the United States is committed to cooperating with other nations to promote responsible operations.

The United States views space systems as vital to our interests. We are committed to international cooperation in order to ensure freedom of all nations to operate in space today and in the future.

It is imperative we understand and appreciate the environment we are operating in, especially with

regard to the significant growth in the number of space systems. This growth is both a challenge and a concern. In 1980 only 10 countries were operating satellites in space. Today more than 50 countries own or have partial ownership in satellites, nine countries operate space launch facilities and citizens of 39 nations have actually flown in space.

In 1980 the United States was tracking approximately 4,700 objects in space, but today we are tracking approximately 19,000 objects. So in 29 years the volume of space traffic has quadrupled.

Space is no longer the desolate and remote ocean it seemed to be during the latter part of the twentieth century. Today it is perhaps better described as an increasingly crowded sea, crisscrossed by shipping lanes filled with traffic of myriad kinds bound for multiple destinations. Some of that traffic is operational and some of it is driverless, adrift and functionally dead.

Today the users in space are more diverse than ever and many more users have access to space services. Our increasingly integrated global economy and our emerging global culture are directly dependent on services provided from space. It is imperative, therefore, for us to approach the activities and understanding of this environment in a cooperative manner.

This slide shows a high-level overview of the United States space surveillance network. One of the key responsibilities of strategic command is to conduct space operations and this includes the operation of our space surveillance network. Our goal is to maintain an acute awareness of space objects and to recognize potential threats early enough to refine predictions and avoidance actions if possible.

Space situation awareness is not a snapshot. It requires continual monitoring of the space environment. In addition, the quality of our awareness improves with a cooperative effort. Actionable space situational awareness requires inputs from every available entity, whether it be from ground stations, the satellites themselves, the owners and operators or perhaps weather stations.

As the number of objects in space continues to multiply an effective picture of the space operating environment can only be achieved by sharing information with others.

On February 10, the United States strategic command became aware of a potential problem when the company of Iridium contacted us and indicated that their company had lost contact with one of its satellites. Shortly thereafter the United States space surveillance network detected multiple new objects in low earth orbit. After careful analysis the space experts assessed that a collision had occurred when the associated the new debris with the Iridium satellite and a non-operational Cosmos communications satellite.

Today, analysts continue to track the resulting debris and assess the risk to United States and other key satellites.

Leading up to the event, the commercial company had not requested United States strategic command to perform a predictive conjunction analysis for its satellite. The command was performing analyses for possible conjunctions on our highest priority missions, including the International Space Station. Day to day we currently do not conduct conjunction analyses for each and every one of the 19,000 objects in space for possible collisions against all of the other objects. A catastrophic event such as this provides a wealth of information and also highlights opportunities to improve operations and procedures.

At United States strategic command we are incrementally improving our operations and this collision event provides an additional impetus for these improvements.

The Iridium-Cosmos event reminds all of us again of just how importance space situational awareness is to our understanding of the increasingly congested space environment. We have identified the need for additional software, hardware and personnel to expand the number of satellites that we can analyze to include the larger set of those satellites according to the United States Government and its operating partners. As our analytic capacity expands it is very important to appreciate that many pieces of debris are so small as to be untrackable, making it impossible to provide a complete picture of the total hazard.

Finally, we recognize that on the whole there have been only limited coordination efforts among satellite owners and operators in the context of space operations.

The United States shares orbital element data on a public space track website that has little direct interaction with international and commercial satellite owners who may be operating in the same orbital regime. We are currently looking at how we can

meaningfully expand space flight safety products for use by all.

We are also exploring how we can better work with international partners to share and exchange space situational awareness information. As more and more nations and more non-governmental actors find their way into space, all who operate in the domain should act as responsible stewards. Any one of us could be a victim of the unavoidable collision with debris and, in its worst form, space debris can have the unwelcome side effect of generating even more space debris, a situation we should all try to avoid if possible. Should this happen, none of us would be immune from the consequences.

As an astronaut with over 210 days in space, I believe I can speak for all astronauts regarding our personal concern of space debris. While flying on the International Space Station I could see visible evidence of extremely small space debris as they pitted our windows and provided wear and tear on our solar arrays and I am sure you would receive the same report from other astronauts and cosmonauts.

However, should the Space Station ever be breached by a significant impact, Russia and the United States have developed excellent emergency evacuation procedures and the always present Russian Soyuz capsule acts as a lifeboat for astronauts and cosmonauts in the event that the Space Station is compromised.

Of course, although humans have an escape option, most of the active satellites in orbit do not have the luxury of an escape plan. The fragility of satellites, combined with the harsher operating environment, serves as an urgent call for action to all stakeholders, whether they are nation States or commercial companies.

Physical inspection of the damage caused by space debris is clearly a difficult task from the perspective of access, but the space shuttle affords us a unique opportunity to study the damage and effect, because it returns to earth after exposure to the space environment.

One of the most significant ways to act responsibly in space is to mitigate regeneration of new debris under normal operations. The Committee on the Peaceful Uses of Outer Space is to be commended for its endorsement of the space debris mitigation guidelines, which were recently also endorsed by the United Nations General Assembly.

In almost all cases the normal launching and deployment of satellites will result in some leftover hardware en route to useful orbit. The challenge then is to design satellites and launch vehicles to limit such debris and to manage that debris to minimize its impact on other uses in space.

As the collision of Iridium and Cosmos demonstrated, another necessary method for mitigating debris is active analysis of the objects in space in order to predict and, ideally prevent, collisions that can cause hazards that multiple generations of satellite operators will have to face.

To support all nations' peaceful use of space, United States shares orbital positional data with the public.

The public website called www.space-track.org provides two line element set data, which is the description of a satellite's position and orbital parameters for registered users. As with all objects large enough to track, data on the new pieces of debris resulting from the collision are posted on this public website so that everyone with assets in space can access the information. Over 37,000 users from 110 nations have registered on this website and many use the data to support their own space operations.

The Joint Space Operation Centre will continue to be our centre Centre for space situational awareness and as we improve its capabilities we will analyze more and more satellites for possible conjunction. Working with our international partners provides opportunities to improve space situational awareness for all peaceful operators in the space domain. As the organization responsible for the United States Government situational awareness, we at strategic command are working to ensure that satellites do not collide with one another or run into space debris.

We are working to foster collaborative data sharing efforts with other partners to enhance global coverage for our mutual benefit. The ability to leverage and expand space partnerships with others holds the potential to dramatically improve space situational awareness and ultimately to ensure we make every effort to keep space a safe environment for space operations.

I would like to close by expressing a sentiment I am sure is shared by all in this audience. Working in space and on space issues is an exciting, important, cutting edge vocation and we are all fortunate to have the opportunity to contribute in this

domain. Going forward we must encourage all space users to build on the foundations laid during the past half century and to remember to operate responsibly in space so that we can ensure the long-term sustainability of our space activities.

We will not always be able to prevent every problem or critical event in the domain, but it is our judgement, our perseverance and our cooperative efforts that will keep us aspiring to improve our methods to operate more safely and to recognize we are recognizing with a precious resource that can very easily be rendered useless if we are careless.

Thank you for the opportunity to engage with this important Committee and we look forward to taking part in further dialogue and collaborative opportunities with you and the member Nations for the betterment of all peaceful uses of space. Thank you.

The CHAIRMAN (*interpretation from Spanish*) I would like, on behalf of the entire Committee, to thank General Helms for her presentation. You have provided us with a personal touch, expressing your concerns about the damage to spacecraft. This is certainly something that, you, as an astronaut, are very sensitive to and it was fascinating to hear of your experiences and the contributions that you have made to space studies. The Committee agrees with you that the more space debris as present the greater the need is for international cooperation and this means, of course, that there is an international responsibility in this area. We should like to thank you for what you have said about existing instruments and the public data which allow for detection of debris. Thank you very much.

The next presentation on my list, which will be complementary to what we have just heard from Brigadier General Helms, will be the consequences of the collision between Iridium and Cosmos and this will be given by Nick Johnson of the United States.

Mr. N. JOHNSON (United States of America) Mr. Chairman and distinguished delegates, I am pleased this afternoon to provide the Committee with an update on the debris created by the collision by Iridium 33 and the Cosmos 2251 satellite.

Much has been learned from routine observations of the United States space surveillance network and special observations using higher frequency radars since my report to the STSC soon after the event.

This data has confirmed the very serious nature of the collision and the likely near-term and far-term consequences. As is well known, the collision of Iridium 33 and Cosmos 2251 represents the first accidental hypervelocity collision of two intact spacecraft. The event occurred on 10 February at an altitude of approximately 790 Km. At the time this altitude regime contained the second highest concentration of catalogued objects in orbit about the earth.

Hence statistically this region was a logical candidate for such a first collision. Today more than 1,500 large debris, 10 cm or larger in size, from the collision, have been identified and more than 1,400 are still being tracked today. These numbers continue to grow almost daily. Many more debris have been detected by the Haystack and Goldstone radars, which can find objects as small as only a few millimetres in size.

These graphics illustrate how quickly the debris clouds spread. The illustration of the upper left shows the exact time of the collision, which took place over Siberia. The second illustration depicts the spread of the large debris in two orbit planes, just one revolution later. The third illustration indicates the rapid spread of debris after just two revolutions.

In the period immediately following the collision these debris clouds were passing through one another at regular intervals. As of last week, large debris from the collision spread from the lowest reaches of low earth orbit up to an altitude of about 1,700 Km, with a highest concentration at the altitude of the collision near 800 Km, which is host to many communications, earth observation and scientific satellites.

Many close approaches of debris from Iridium 33 and Cosmos 2251 to other resident space objects have already occurred, leading to multiple collision avoidance manoeuvres, including one by NASA's cloud set satellite in April. The number of tracked debris from Cosmos 2251 is now almost exactly twice that from Iridium 33. This is not unexpected since Cosmos 2251 had nearly twice the mass of Iridium 33.

As of last week, 430 debris from Iridium 33 were being tracked and this number has already increased. The larger number from Iridium 33 are less spread out from Cosmos 2251, indicating slightly less energy involved. The debris from Cosmos 2251 now exceeds 1,000 objects and is spread almost throughout the entire lower orbital regime.

This animation illustrates the relative positions of the debris over the planes on 1 June and how they will continue to spread during the next two years. The debris planes in red are from Cosmos 2251 and debris planes in green are from Iridium 33.

The debris from Cosmos 2251 diverges or spreads more rapidly because the debris are in lower inclinations, where differential procession is greater. By the end of the two-year period, the earth is essentially encased in this debris.

Since the United States space surveillance network has tracked many of these debris for several months, estimates can now be made of their drag characteristics or area to mass ratios. The accumulative area to mass ratio for debris from Cosmos 2251 very closely follows the curve predicted by NASA's standard bracket ball. However, the debris from Iridium 33 is substantially offset from the standard curve, with higher average area to mass ratio. This is primarily probably due to the use of composite materials for the construction of Iridium 33.

Using the derived area to mass ratio data seen on the previous page, estimates of orbital life times of the collision debris are now possible. As expected, on average Iridium 33 debris will be shorter lived than the debris from Cosmos 2251 due to the higher average area to mass ratios of the Iridium spacecraft.

If solar returns to normal, half the debris will remain in orbit for less than five years, although some degree from both satellites will remain in orbit for many decades.

If, on the other hand, as many scientists are predicting, solar activity remains below the average levels for the cycle, the debris will be longer lived. Without question, the collision of Iridium 33 and Cosmos 2251 represents the most severe accidental satellite fragmentation event. More than 1,400 large debris are currently being tracked by the United States space surveillance network and if solar activity resumes the […] more half the debris will re-enter within five years. However, as of last week only 35 catalogued debris had fallen back to earth. Some of this debris will remain in orbit through the end of the century. Thank you Mr. Chairman and distinguished delegates for your attention.

The CHAIRMAN (*interpretation from Spanish*) Thank you very much, Mr. Johnson, on behalf of the Committee. Thank you for this interesting presentation on the consequences of the collision between Iridium 33 and Cosmos 2251 which completes the information received in the preceding presentation.

We have now arrived at our last presentation which will be given by Mr. Rum, the representative of GEO on the operational use of space-derived geospatial data: the key role played by GEOSS.

Mr. G. RUM (Group on Earth Observations (GEO)) [Presentation: Operational use of space-derived geospatial data: the key role of GEOSS]

The CHAIRMAN (*interpretation from Spanish*) Thank you. On behalf of the Committee let me thank you as representative of the Group of Earth Observations for the practical utilization of space data. A very key role, GEOSS, there for the benefit of all.

Now we have five/ten minutes for questions and answers to the different reports, Helms, Johnson and Rum. I am quite sure that you have many questions. I see several delegations, Brazil, Greece, India and we will begin with them.

Mr. J. FILHO (Brazil) (*interpretation from Spanish*) Thank you Chair. I have question for Madam Helms. Not so long ago there was a public hearing in the United States, in the Congress, with satellite operators and industry representatives. During this hearing it was stated, by the industry operators, that space data distributed in the United States were not complete because that would be a threat to the operators in preventing new satellite collisions. I was very surprised by this bit of news. I think this is a good time to try to find out what she thinks about these statements that were made at that hearing and just to specify. I read most of this in the New Scientist which is published in London.

The CHAIRMAN (*interpretation from Spanish*) Would you be willing to answer?

Ms. S. HELMS (United States of America) Yes, I was not at the hearing that was referenced to by the delegate from Brazil. Unfortunately it is difficult for me to understand exactly what was said and the context under which it was said so that I could provide a comprehensive answer, perhaps try to interpret what was said in that particular hearing.

I think my message today is that the United States is interested in discussing international partnerships and cooperation about the space environment in which we can look at ways in which data can be shared so that it is for the benefit of all of us. In my remarks I did reiterate that certainly space

debris is one of the risks that is growing, one of the best ways to understand that risk is to have the information. Many space-faring nations have pieces of the story and our goal today is for the United States to put out the message that we would like to share our collective stories and perhaps have an overall integrated understanding on what is happening in space and use that as an opportunity to step forward and figure out how to make our practices in space more safe than what we are doing today, if possible.

The CHAIRMAN (*interpretation from Spanish*) Thank you Madam Helms. Let me also add, you mentioned that non-governmental actors should also act with greater responsibility and we have also agreed with that line of reasoning.

Let me give the floor to Greece.

Mr. V. CASSAPOGLOU (Greece) I am not very sure if I have to express myself in English or in French. I will make an exception to honour Dame Helms, so I will speak in English. I will do my very best to be understandable.

First of all, I would like to express, and I think the common sentiments of all of us, our gratitude to be here and join us in an effort to explain to us how dangerous is the creation of the production of space debris by any kind of user of outer space.

Recently, I was better than previously informed about the catastrophic weapons, not only traditional but also very sophisticated electronic methods, for destroying humans and because we have with us a human being, Dame Helms, who has been living in space for almost one year and being exposed to all these dangers. It is, I think, the most appropriate person to make us understand how we have to work for the peaceful uses of outer space. Unfortunately, 90 per cent of the actual, functional, space objects are for military uses and the risk, not only for a collision but also for a conflict, by a kind of misunderstanding is very possible. I say all these words because I think that first of all we needed to have with us, I have said this for many years, in a national delegation, astronauts.

Fortunately, next year we chair for two years our Committee, the very close friend, I can say, brother, Dumitru Prunariu of Romania but we need to have them with us just to teach us how we have to consider outer space which is now, because of the uncontrolled production of space debris, almost a kind of minefield. The problem is now, how, and I said that two years ago because January, February as the fatal months of space activities, at least for these three last years. I said, apropos of the ____(?) destruction of the USA 193, if I am not wrong, that even and also for China, let us say event, I do not accept to say test, I do not believe that it is tests. I said that we have, even in these specific cases, to put under the control of international society any of this kind of activity or action because we have not an uncontrolled, unlimited use ____(?). You can destroy a satellite with problems like the one with US193 but, under some conditions, technical as well as legal. Where is the vacuum? It is because we do not an international ____(?) outer space activities organization and every national space activities are uncontrolled is at the mercy of the local governments and if you, dear friends, ladies and gentlemen, read the national laws on space activities of some States, you will be crazy. Some of them speak about lebensraum. You can imagine after half a century to speak again for lebensraum. No my friends. Space should be and is a part of the global cosmic environment and we have to protect it.

I close this intervention, with your kind attention, repeating what one of the biggest personalities of the twentieth century said, the liberator of Europe, General, I do not say President, General Eisenhower. Some weeks after the first Sputnik in a letter addressed to Bulgarin, the Premier of the Soviet Union at that time, he spoke about the ballistic missiles to be used in outer space and Eisenhower said, the time to stop is now, unfortunately it is half a century but this voice is not said ____(?). Thank you very much.

The CHAIRMAN (*interpretation from Spanish*) Thank you delegate of Greece. I give the floor to other delegations and we really wish to conclude with that because we are running short of time.

India and then Venezuela.

Mr. U. RAO (India) Thank you Mr. Chairman. I have one question to Miss Helms. Is there a database available for all 90,000 objects tracked by USA? If so, do other agencies have access to that?

Ms. S. HELMS (United States of America) Yes, I can answer that question. There is a database where the United States is publicly posting available element sets of all of the objects in space of which we are aware. That database can be found at a website, it is, space-track.org. At this moment there are at least 110 nations that have registered to look at that data and download that data for any purpose. If you need more information we can certainly pass that on after the meeting. That is available today and we do our best to put out there information about all of the objects of which we are aware.

The CHAIRMAN (*interpretation from Spanish*) Thank you very much Madam Helms for that answer.

Mr. R. BECERRA (Bolivarian Republic of Venezuela) (*interpretation from Spanish*) Thank you Chair. I will be very brief. We just take this appropriate time to draw the attention of COPUOS, after these very interesting presentations, that whenever we hear of highly motivational speeches we never seem to get any further. We have to be very practical here. We have guidelines to mitigate space debris that already exist and this is why we would again to propose to COPUOS that these guidelines be presented to the Legal Subcommittee, not to change them, but so that they serve as a motivation in regulating binding norms and laws allow us to deal with the problem of space debris. That is our job, this is what we have to do, anything else is taking us away from it. Thank you.

The CHAIRMAN (*interpretation from Spanish*) Just for Venezuela's information, the mitigation guidelines for space debris are nearly adopted after a very arduous work where consensus had to be achieved and these things take time but we do note your position here.

Is there any other delegation that wishes to take the floor.

Mr. Y. XU (China) Thank you Mr. Chairman. Very briefly due to time constraints I will not go into a debate. The 2007 event involved China as a ____(?) reply, I will not repeat what we have said during the last session on that event. What I want to emphasize is that China is a strong supporter for the peaceful use of outer space and we take active measures to mitigate space debris as well as other measures to keep space as safe as possible. Under the terminology on that, I agree that anybody can have the freedom to choose words they think is fit for that event but I have to repeat that China has no intent to weaponize outer space into a ____(?)in outer space. Thank you Mr. Chairman.

The CHAIRMAN (*interpretation from Spanish*) Let me thank you for that clarification on this specific topic. Again, on behalf of the Committee, let me express my thanks to the three presenters. Their lectures were very interesting and have been of great interest, as we can see, to this Committee.

I will shortly adjourn the meeting of the Committee but before doing so I would like to inform delegates of our schedule of work for tomorrow morning.

We will convene promptly at 10 a.m. We will continue and conclude item 9, spin-off benefits of space technology. We will continue item 12, space and climate change and 13, use of space technology in the UN system. We will begin 14, use of space-derived geospatial data for sustainable development. Time permitting, we will begin consideration of agenda item 10, space and society and 11, space and water. Tomorrow morning, we will have four technical presentations. The first from Poland, Polish students space activities. Second, Spain, Astronomy the large telescope in Canarias and the darkened sky. Third one by a representative of Colombia on space technology to support sustainable development of Colombia. Fourth, a representative of the United States, report of activities of the Space Policy Institute.

Are there any questions?

I see none.

I would like to invite you to a conference at the University of Vienna entitled: Perspectives of space exploration and the role of the United Nations, tonight at 7 p.m. to be followed by a reception. You have received invitations in your pigeon holes.

The Austrian delegation wants to add some additional information.

Ms. C. REINPRECHT (Austria) I just wanted to inform delegates who are interested to go to the conference venue, the conference will take place at the University of Vienna. We would meet at the end of this session in the ante-room of this conference room so we have the possibility to go together this would facilitate delegates to find the way to the University of Vienna so that would be something we would offer. This would be me and my colleagues in the back, we would meet there in front of the elevator and go together. For those who might not want to join us. To get there is quite easy you just take the tram to Schottentor and then it is quite easy to go there but in any case we would be ready to accompany there. Thank you very much.

The CHAIRMAN (*interpretation from Spanish*) Thank you very much for those words. Then we adjourn until tomorrow morning.

The meeting closed at 6 p.m.