



Eye on Earth Summit Bulletin

A Summary Report of the Eye on Earth Summit

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SUMMARY OF THE EYE ON EARTH SUMMIT: 12-15 DECEMBER 2011

The Eye on Earth Summit (Eye on Earth 2011) convened under the Patronage of His Highness Sheikh Khalifa Bin Zayed Al Nahyan, President of the United Arab Emirates (UAE), from 12-15 December 2011 in Abu Dhabi, UAE. The Summit brought together over 1000 participants, representing governments, international organizations, academia, the private sector and non-governmental organizations (NGOs). Held under the theme “Convene, Converge, Collaborate,” discussions during Eye on Earth 2011 centered on strengthening existing efforts and inspiring a search for unified, global solutions to the issues that preclude access to data.

Eye on Earth 2011 featured plenary sessions which formed the “backbone” of the Summit. These plenary sessions featured keynote speeches and panel sessions on varying issues, including water security, financing, disaster management, and oceans and blue carbon. The Summit also featured open sessions, during which four working groups on “Policy, Governance and Institutional Networking,” “Content and User Needs,” “Technical Infrastructure,” and “Capacity Building, Education and Awareness,” took place to finalize the Special Initiatives that were launched at the end of the event.

Eye on Earth 2011 was preceded by the Civil Society Forum, which provided a forum for civil society representatives to prepare and consolidate their inputs into the Summit, and create consensus on key areas of access to, and use of, environmental information. The Forum also discussed measures to collaborate towards strengthening existing initiatives and filling gaps to allow more informed policy making. “Rio+20” sessions were also held during the Summit, which provided a forum for senior officials, including ministers, deputy ministers and directors, to discuss the role of environmental information in supporting decision making. These sessions were responsible for drafting the Eye on Earth Summit Declaration, to be forwarded to the UN Conference on Sustainable Development (UNCSD or Rio+20), being held in June 2012, for its consideration.

Various events were also held at the Eye on Earth Exhibition, including showcases of related technologies. The Abu Dhabi Global Environmental Data Initiative (AGEDI) showcased current projects and proposed additional projects on climate change assessment, harmonized land monitoring, biodiversity assessment, deforestation monitoring, blue carbon, integrated education tools and regional water modeling, while an “Eye on Earth Theatre” featured special presentations by anthropologist Jane Goodall, cultural consultant and television host Ali Al Saloom, Philippe Cousteau Jr of EarthEcho International, Daniel Edelson of National Geographic Society, and polar explorer Rob Swan.

Over the course of the Summit, participants stressed the urgency of taking action to tackle environmental problems, and highlighted the importance of collaborating to ensure that good quality data is collected, freely disseminated and transformed into useful information. Participants also heard that developing countries need to be able to improve their capacity and access suitable technology for data analysis. Five thematic initiatives and three foundation initiatives were launched to assist in moving the Eye on Earth vision forward.

This report summarizes the presentations and discussions held during the plenary sessions, including the panels, in chronological order.

A BRIEF HISTORY OF THE EYE ON EARTH INITIATIVE AND ASSOCIATED PROCESSES

As the upcoming UNCSD marks the 40th anniversary of the first major international political conference that specifically had the word “environment” in its title, and the 20th anniversary of the 1992 UN Conference on Environment and Development (UNCED), also known as the Earth Summit, the world is facing challenges such as water scarcity, food security and climate change, which require action and solutions extending beyond political boundaries. The need for collaboration and information to tackle these problems is greater than ever, and access to environmental knowledge has never been more critical.

Many scientists, policy makers and private citizens still rely on limited and poorly presented environmental data and information. Across the board, the paucity of environmental data and the lack of adequate technology to process and use the data are proving to be an increasing hindrance to achieving sustainable development, particularly in developing countries. Barriers, such as limited monitoring and data collection initiatives, lack of coordination among data providers, cost of accessing data sets, and the cost of technology to process

IN THIS ISSUE

A Brief History of the Eye on Earth Initiative and Associated Processes.	1
Summary of the Meeting	2
Mind the Gap	2
From a Moment to a Movement.	4
Effecting Change	6
Delivering the Vision	8
Eye on Earth Summit Declaration	10
Upcoming Meetings	11
Glossary.	11

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and use data, can result in inaccurate and ineffective decision making and policy implementation. Without overcoming these barriers, the world, and emerging economies in particular, stands to lose valuable environmental assets and resources.

UN CONFERENCE ON ENVIRONMENT AND DEVELOPMENT: The Earth Summit was held from 3-14 June 1992 in Rio de Janeiro, Brazil. Its principal outputs were the Rio Declaration on Environment and Development, Agenda 21 (a 40-chapter programme of action) and the Statement of Forest Principles. The UN Framework Convention on Climate Change and the Convention on Biological Diversity were also opened for signature during the Earth Summit. Agenda 21 called for the creation of a Commission on Sustainable Development (CSD), as a functional commission of the UN Economic and Social Council (ECOSOC), to ensure effective follow-up of UNCED, enhance international cooperation and examine progress in implementing Agenda 21 at the local, national, regional and international levels.

WORLD SUMMIT ON SUSTAINABLE DEVELOPMENT: The World Summit on Sustainable Development (WSSD) met from 26 August to 4 September 2002, in Johannesburg, South Africa. The goal of WSSD, according to UN General Assembly Resolution 55/199, was to hold a 10-year review of UNCED at the Summit level, to reinvigorate the global commitment to sustainable development. WSSD negotiated and adopted two main documents: the Johannesburg Plan of Implementation (JPOI); and the Johannesburg Declaration on Sustainable Development.

The JPOI is designed as a framework for action to implement the commitments originally agreed at UNCED and includes chapters on: poverty eradication; consumption and production; the natural resource base; health; small island developing states; Africa; other regional initiatives; means of implementation; and institutional framework. The Johannesburg Declaration outlines the path taken from UNCED to WSSD, highlights challenges, expresses a commitment to sustainable development, underscores the importance of multilateralism and emphasizes the need for implementation. It goes further to highlight the urgent need for coordinated observations relating to the state of the Earth.

ABU DHABI GLOBAL ENVIRONMENT DATA INITIATIVE: AGEDI was launched on 2 September 2002 at WSSD, in response to the lack of quantifiable environmental data, which can hinder achieving sustainable development. A Type II initiative, which is a non-negotiated initiative in support of the implementation of Agenda 21 and the JPOI, AGEDI was also launched as a response to the UAE's concern about the approach and criteria used for the results of the Environmental Sustainability Index (ESI), produced by the World Economic Forum in February 2002. The UAE in this Index was ranked 141 out of 142 countries, with an ESI of 25.7.

AGEDI works with partners, members and stakeholders throughout the world to achieve a more sustainable future through "best-impact" access to environmental and societal data. Focusing on support to developing countries and emerging economies, AGEDI's current scope includes: monitoring and enabling effective data access and availability across worldwide environmental and societal information networking movements; identifying data needs; determining strategies for data access, acquisition and dissemination; implementing projects which address specific data, information and knowledge product needs; enabling and facilitating local,

regional and global participation in, and support of, an active network of thought and action leaders; and ensuring capability and capacity building of developing countries and emerging economies to support "best-impact" access and application of data and information for decision making. The Eye on Earth Summit has been facilitated by AGEDI to strengthen existing efforts and inspire a search for unified, global solutions to the issues that preclude access to data.

SUMMARY OF THE MEETING

MIND THE GAP

The first day of the Eye on Earth Summit (Eye on Earth 2011 or the Summit) convened under the theme "mind the gap." In her keynote address on Monday morning, Razan Khalifa Al Mubarak, Secretary-General, Environment Agency - Abu Dhabi (EAD), welcomed participants. She explained the United Arab Emirates' (UAE) commitment to environmental information and data, embodied by the Abu Dhabi Global Environmental Data Initiative (AGEDI), announced at the 2002 World Summit on Sustainable Development (WSSD). She said that Eye on Earth 2011 is held in recognition of the need for social and environmental data to be collected in a scientific manner, made publicly available, and reported in ways that support decision making. She underscored that this is of particular importance to developing countries, such as the UAE, which have, historically, not had access to such data.

Cathrine Armour, EAD, acknowledged the importance of enabling access to environmental and scientific information, but stressed that using such information to inform wise decision making is even more important. Noting the work of William Smith, which gave rise to modern geological mapping, she said that the ideal of a green economy demands "a new foundation, a new map of information and data, a new understanding of our world" that provides for "wise and compassionate decision making."

Jack Dangermond, CEO, Environmental System Research Institute (Esri), discussed the role of geospatial systems in helping policy makers and other actors understand a rapidly changing world. He noted their applications for monitoring environmental change, managing natural resources, and responding to natural disasters. While acknowledging the importance of national efforts to create environmental data infrastructures, he stressed that such efforts need to be taken to the macro level, and a technology platform needs to be developed that enables the information to be shared as widely as possible. He predicted that intelligent internet-based mapping tools, allowing a variety of "mash-ups" and linkages between scientists, planners, designers and decision makers, are in the process of "creating a new kind of nervous system for our planet." He called for vision and leadership to: adopt open sharing policies; develop a global plan to integrate this trend with other ongoing technological developments; develop new standards to allow interoperability of systems; and provide governance for collaboration in dealing with "the big challenges."

Aspasia Camargo, State Deputy, Rio de Janeiro, Brazil, stressed that Eye on Earth 2011 will contribute to the success of Rio+20, which must improve on the weak results of Agenda 21. Camargo highlighted three areas where environmental and social information is indispensable for measuring and managing sustainable development: the green economy, poverty eradication and good governance. She urged the World Bank to provide loans for initiatives that make information continuous,

comparable, available and reliable. Camargo said effective information depends not only on quality data but also on tools for hypothesis-making, diagnosis, interpretation and analysis.

Adel Abdel-Kader, UN Environment Programme (UNEP), presented the history, structure and expected outputs of Eye on Earth 2011. He said the Eye on Earth (EOE) vision was to promote information and knowledge for sound decision making and policy formulation to meet the challenges of sustainable development. He pointed to building international networks of experts to fill the information gap between developed and developing countries, and ensure information is accessible to decision makers at all levels. Abdel-Kader outlined his expectations from Eye on Earth 2011, including: an EOE declaration; a detailed framework document on post-summit deliverables and follow-up actions; a set of technical papers focused on issues identified by the working groups; and proposals for special initiatives and partnerships to strengthen developing country capacity and developed country donor commitments in areas such as food and water security, and disaster response.

On Monday afternoon, Rachel Kyte, World Bank, called for developing a business plan to manage the planet, which incorporates natural asset valuation, invests in inclusive green growth, and promotes open and transparent data for democratic development. Kyte noted that the 20 years since the 1992 UN Conference on Environment and Development (UNCED or Earth Summit) have proven that it is possible to reduce poverty, restore and protect ecosystems, and generate extraordinary growth. She said, however, that a new model based on green growth that leverages private enterprise, rather than development based on overseas aid, is needed to pursue social, environmental and economic goals simultaneously. Kyte highlighted climate change and a lack of credit for individuals and businesses in developing countries as obstacles to inclusive green growth, and pointed to the need to mobilize all forms of capital and finance, by, *inter alia*, supporting domestic capital markets in developing countries.

John Scanlon, Secretary-General, Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), pressed for practical measures to advance high-level principles for addressing the over-exploitation of biodiversity. He said that every country must ensure that its trade in wild flora and fauna is legal, sustainable and traceable, and that this requires: up-to-the-minute data on all international wildlife trade wherever it occurs; access to online expertise and capacity building; and the capacity to access and link datasets to support coherent policy. Scanlon identified a number of effective information systems developed by CITES, including electronic permits, the CITES Trade Data Dashboards for visualizing and monitoring species trade, and the CITES Virtual College for fostering online learning and training.

The afternoon plenary closed with a speech from Rob Swan, polar explorer, on "Team Work: the Whole is Greater Than the Sum of the Parts," which emphasized personal leadership, leading by example, showing commitment, pursuing dreams even when others say it is impossible, inspiring youth around the world to get involved, and the importance of sustaining inspiration.

PANEL ON OPEN COLLABORATION: Ayesha Yousef Ahmed Husain Al Blooshi, EAD, introduced a panel discussion on "open collaboration," explaining the organization and work of the five working groups that had been convened to identify and frame the most challenging environmental data and information issues, and which had met during the six months

preceding the Summit. The panel consisted of the working group co-chairs and a moderator, Abbas Rajabifard, President, Global Spatial Data Infrastructure Association (GSDI). Four of the five working groups met between the plenary sessions, in the open sessions, to discuss key issues and develop key takeaway messages to deliver to plenary.

Working Group One on Policy, Governance and Institutional Networking focused on network governance, policies that encourage information sharing and collaboration across sector-based boundaries, associated financing mechanisms, and using information-sharing infrastructure to prepare integrated environmental assessments necessary for sustainable development.

Working Group Two on Content and User Needs focused on specific data and information needs, including issues such as data quality and validity, common areas of content, the contribution of data from all sectors of society, and early operational wins to demonstrate the value of collaboration.

Working Group Three on Technical Infrastructure focused on the standards for the capture, description and structuring of scientific data, and the development and delivery of various products and services. It also addressed metadata, shared multi-purpose data, capacity building and technological support.

Working Group Four on Capacity Building, Education and Awareness Raising focused on matters related to environmental awareness at all levels and types, as well as capacity building. It addressed, *inter alia*: knowledge and technology transfer; knowledge management; technological capacity; and crowdsourcing.

Working Group Five on Applications Showcase focused on evaluating examples of existing networks and technologies to identify which applications can be leveraged to connect ongoing efforts in different regions, so that commitments to data sharing, content and standards are made. It addressed various themes, including: identifying and building collaborative partnerships between existing networks; identifying and developing quick-win scenarios; and leveraging and promoting existing, good example networks.

Rajabifard invited the working group co-chairs to discuss the objectives, achievements and outcomes of the work of their working groups over the six months before the Summit and during the first day of the Summit.

Lalanath de Silva, Co-Chair, Working Group on Policy, Governance and Institutional Networking, reported that his group had identified types of existing networks, determined which were bottom-up or top-down, and examined their governance structures. He noted that as a result of discussions, consensus was emerging on the need for both top-down and bottom-up networks. He noted tensions within the group between technology-oriented groups and right-based advocates, but reported that the group generally supported Brazil's call for Rio+20 to launch negotiations on a global convention on the application of Principle 10 of the Rio Declaration. De Silva also noted two special initiatives discussed: one on a network of networks; and the other on access for all.

Chris Steenmans, Co-Chair, Working Group on Content and User Needs, said a user-driven approach was seen by working group members as essential to the establishment of global environmental information systems to meet numerous challenges, including biodiversity loss, climate change and risk management. He highlighted the enormous human and technological potential for innovation, citing the possibility for everyone to be an actor in global information systems and for 50 billion environmental sensors to be connected around

the world by 2020. Steenmans reported that the group had identified three gaps impeding information systems from meeting user needs, as follows: technical and legal gaps to accessing information; data gaps; and gaps in tools for data sharing. He said the working group concluded that these gaps could be filled by: building a global environmental knowledge network; creating incentives for institutions and individuals to collectively share and use data; and translating information into the language of decision making.

Harlan Onsrud, Co-Chair, Working Group on Technical Infrastructure, noted that the working group agreed on several ways to advance technological development, but stressed the need for better handling of concepts within systems to improve information- and knowledge-sharing. He related that the group had spent much time discussing how improved technical standards should be matched by legal advancements. Onsrud also underscored the need to acquire metadata for crowdsourced data, since without understanding its context and reliability, the data gathered is of little value. He reported that the group concluded that, for sound global environmental decision making, it is more important to gain access to existing data than to develop new technologies.

William Sonntag, Co-Chair, Working Group on Capacity Building, said the working group noted a growing movement to make geo-data part of both decision making processes and everyday life. He stressed that many of the organizations participating could have come to Eye on Earth 2011 “hat in hand” asking for funds for their own projects, but instead came with a clear understanding of the need to institutionalize broad-based information gathering, processing and dissemination. Sonntag spotlighted the presentation on The Access Initiative (TAI) and the presentation of the CITES Secretariat about their work to tie-in their information system with curricula.

Kate Chapman, Co-Chair, Working Group on Applications Showcase, said the working group had decided not to pursue a speaker track and working session during Eye on Earth 2011, and had focused, instead, on identifying existing and emerging technologies and networks that could be showcased during the Summit.

Panel Moderator Rajabifard asked the co-chairs to identify major opportunities for cross collaboration. De Silva highlighted the call by participants for Rio+20 to launch negotiations on a global legally-binding instrument on Principle 10 of the Rio Declaration. Onsrud urged keeping open the channels that had been established to plan the Summit so that the dialogue could continue. He stressed that the human network is at least as important as the technological networks involved.

Responding to questions from the floor, panel members said, *inter alia*, that: governments, including their statistical agencies, will need substantial information in order to measure sustainability, especially if Rio+20 takes up the suggestion of creating “sustainable development goals” modeled after the Millennium Development Goals (MDGs); information systems need to take into account how best to promote participation and access to information and justice by women and vulnerable groups; and an international agreement on applying Principle 10 will not suffice without an environment that enables public involvement and public access to environmental data and information.

FROM A MOMENT TO A MOVEMENT

The second day of Eye on Earth 2011 convened under the theme “from a moment to a movement.” In the morning, plenary began with a musical performance, the telling of a

traditional story exhorting environmental protection, and a video on the promise for the data revolution to enhance decisions in a rapidly changing world. Mohammed Al Madfaei, EAD, emphasized the role of Eye on Earth 2011 in promoting public-private partnerships that support decision making by combining and updating environmental and social data. Rashid Ahmed Bin Fahad, Minister of Environment and Water, UAE, on behalf of Sheikh Mansour bin Zayed Al Nahyan, Deputy Prime Minister and Minister of Presidency Affairs, UAE, wished the Summit success in initiating tangible outcomes that advance development in the emerging economies of the region and in developing countries across the world. Mohamed Ahmed Al Bowardi, Managing Director and Board Member, EAD, stated that Eye on Earth 2011 was an important step towards Rio+20 and long-term planning for a post-oil world.

Former US President Bill Clinton, in his keynote address to plenary, remarked that everyone recognizes that they live in an interdependent world that is not sustainable considering current models of energy and natural resource consumption. He underscored that the world faces the same basic decision it has faced since the fall of the Berlin Wall 1989: should people share their common future in a positive way, take no action, or focus only on their own interests to the detriment of others? He advocated choosing a path of shared responsibility, action and prosperity.

Clinton remarked that the outcome of the UN Climate Change Conference held in Durban, South Africa in December 2011, would have little impact without concrete projects proving the environmental and economic viability of taking action. He conceded that while action may involve strategic variations for developing and developed nations, all can benefit from actions like energy efficiency and greater use of solar, wind and geothermal power. He suggested that the biggest obstacles are financing and the absence of sound demonstration projects for viable approaches.

In the ensuing question-and-answer session, a participant asked Clinton whether fast-growing cities in developing countries can be held accountable for their environmental impacts given their developmental stages. Clinton responded that all cities must address their greenhouse gas (GHG) emissions, stressing that as half of the Earth’s population is now urbanized, cities have become a major source of emissions. He mentioned practical avenues for addressing emissions, including retrofitting old buildings, requiring certain efficiency standards in new buildings, using renewable energy sources, and eliminating landfills through recycling, composting and waste-to-energy projects.

Asked what challenges cities face when measuring and disclosing their carbon emissions, Clinton replied that there are a number of problems, including a lack of capacity to conduct and report such assessments, and a lack of understanding about the importance of undertaking the task. He hoped some initial projects would demonstrate the viability and value of doing so, so that more cities would undertake the task.

Another participant asked for examples of situations where lack of qualified environmental data has hindered the achievement of sustainable development. Clinton responded that it was more important to acknowledge that the lack of data is often used as an excuse not to act. He opined that there is no need for more data to understand the value of improving efficiency, reducing GHG emissions or recycling.

In response to a question on whether major impacts from many disasters could have been prevented through better data, Clinton said that some impacts are avoidable simply through better early warning systems. He mentioned a study that found

that if the wetlands around New Orleans had been preserved, Hurricane Katrina probably would not have broken the levee gates and 90% of the damage to the city might have been avoided.

In the afternoon, participants gathered to hear from speakers about different solutions for greater data accessibility. Sha Zukang, UN Under-Secretary-General for Economic and Social Affairs and Secretary-General of Rio+20, noted the need to address the challenges of how to better utilize data for the environment and sustainable development. He highlighted that timely and accurate data contributes to monitoring and assessment initiatives that can better inform policy makers and practitioners for successful sustainable development. Outlining a number of UN initiatives using a geographical information system (GIS), he called for enhancing integrated assessments, as well as making data freely accessible in usable formats.

Achim Steiner, Executive Director, UNEP, presenting on the EOE mission, said that although there are many networks and ongoing data gathering efforts, there is still much to be learnt about the Earth and how humans manage its systems. He stressed the need for increasing the speed with which data is collected, collated and disseminated, and emphasized that with the advent of cell phones, civic science is more easily available and should be utilized.

Monique Barbout, CEO and Chairman, Global Environment Facility (GEF), emphasizing the need to move the green economy from an abstract concept into a concrete reality, highlighted the GEF's efforts to build information systems for managing natural resources and bridging the technological and educational gaps between the developed and developing world. She said most GEF projects allocate 10% of their budget to hardware, GIS and remote sensing software, and expert training. She described various GEF investments in information systems related to, *inter alia*, climate proofing coastlines in Tanzania, training technicians in Congo Basin countries to use low-cost and custom-made GIS and remote sensing systems, and promoting desert livelihoods and ecosystems in the Middle East and North Africa (MENA) region.

Rashid Ahmed Bin Fahad affirmed the need to reverse the environmental degradation caused by massive development, saying that this degradation was due, in part, to a lack of data. He referenced numerous UAE efforts to leverage data for improved environmental management, including AGEDI and Al Basama Al Beeiya (Ecological Footprint Initiative) in collaboration with the Global Footprint Network.

Hernando de Soto, Institute for Liberty and Democracy, Peru, discussed how the Institute's investigation of the story of the Tunisian street vendor whose self-immolation triggered the "Arab Spring" illustrates the importance of documenting and formalizing the rights and property of poor, extra-legal or "informal" entrepreneurial classes present in large numbers across the MENA region. He suggested that counting, mapping and otherwise illustrating the numbers and barriers involved could identify ways for governments to address and tap the aspirations of the estimated 180 million Arabs in this particular underclass.

Mark Plotkin, President, Amazon Conservation Team, discussed his experiences in combining the "ancient wisdom" of indigenous communities with modern technology to map portions of the Amazonian rainforest. He discussed how his organization trained indigenous communities to map a 10 million acre national park they inhabit in the Brazilian state of Amapá. He advocated for more projects such as these, noting that these communities should also monitor lands for environmental changes and illegal activities affecting them.

Rebecca Moore, Founder, Google Earth Outreach, presented on three initiatives of the organization: Google Earth Engine; Google Earth Builder; and Google for Android. She said Google, through these initiatives, aims to deal with the problems caused by vast amounts of available data such as interoperability, data storage requirements and increased needs for processing power, as well as differing technological capabilities, by providing increased data accessibility and a space for data to be analyzed swiftly and efficiently. She also stressed that many of the projects embarked on under the initiatives are driven by user needs.

Chief Almir Surui, Amazon indigenous leader, provided an explanation of the management of his territory in the Amazon Basin. He lamented that due to a loss of territory caused by deforestation, his tribe's population had decreased dramatically, leading to the formulation and implementation of a 50-year plan for the economic and sustainable development of the territory, in collaboration with other leaders in the area. He noted that equilibrium needs to be created between the conservation of the forest and the economic benefits the forest can provide.

Gilberto Câmara, General Director, National Institute for Space Research, Brazil, described how making environmental information public helps to police illegal resource extraction and build transparency in ways that translate into measurable results. He gave the example of a 23% decline in Brazilian deforestation largely due to improved monitoring and enforcement since 2004.

Jack Dangermond stressed that data sharing and measurement must be integrated with tools for creating a better world. He presented two such tools: geo-design and geo-information products. Dangermond explained that geo-design is a systematic process of measurement, modeling and interpretation that translates raw data into a tool for working with the iterative and step-by-step reality of projects on the ground. He described geo-information products as tools that facilitate geo-design by fostering understanding and supporting action. Dangermond said that good geo-information products present data in a timely manner, communicate important insights, illustrate change through time, and clearly visualize complex relationships.

Jane Goodall, Jane Goodall Institute, discussed her realization that in order to protect animals, she needed also to help the human communities around animal habitats. She introduced the head of conservation science at the Institute, Shadrack Kamenya, who explained how high-resolution remote sensing was used to not only document habitat loss, but also aid human communities in planning land use and designing conservation action plans that both protect animals and improve human lives. Goodall said these experiences could be duplicated anywhere in the world, and urged greater engagement of youth in protecting and shaping their future.

Rand Knight, Critigen, contrasted the common wisdom on how best to effect environmental change just after the 1992 Earth Summit and today. He argued that whereas in the past, common wisdom held that years of specialized training and persuasive work to win "buy-in" of all parties was required to get action on an environmental issue, this is now no longer necessary as "citizen scientists" can be empowered by tools on their smart phones that educate them and get them actively involved in monitoring and demanding action. He called for utilizing the technology and tools that already exist rather than waiting for new ones.

Jacqueline McGlade, Executive Director, European Environment Agency (EEA), showed a film on the threat climate change presents to food security and stressed the

importance of the EOE Network for allowing freer access to data. She said that the EOE Network, which has been jointly developed by the EEA, Esri and Microsoft, is an online service that will allow a two-way channel for sharing of best practices between the different scientific communities, in order to enable successful sustainable development. She said that this initiative provides access to a range of datasets across different networks, which are submitted by users of the platform, highlighting that users can, via online mapping tools, use the data to create additional “layers” to, *inter alia*, analyze social development, economic factors, transport and land use. She noted that the EOE Network draws on users from all walks of life, in the hopes that online collaboration and submission of data and observations will assist in filling crucial data gaps and crowdsourcing information, including from citizen science, indigenous knowledge and lay expertise.

Susan Hockfield, President, Massachusetts Institute of Technology, noted the need for a multidisciplinary approach to enable sustainable consumption and production practices and tackle increasing GHG emissions. She stressed the need for rapid technological advancement that will lead policy, suggesting that both scientists and engineers can contribute to this.

Dennis Garrity, Director General, World Agroforestry Centre, said that the greatest blight on the integrity of the global community is the persistence of hunger in a world of growing prosperity. He made the case that rural hunger can be reversed at little cost by helping small-scale farmers regenerate their land through agroforestry. He called on those present to help scale up agroforestry in Asia and Africa, by supporting the Evergreen Agriculture movement and launching a new alliance of spatial data knowledge users and providers.

Abdulkarim Al Raeisi, Abu Dhabi Spatial Data Infrastructure Program (ADSDI), recounted the success of ADSDI in promoting an integrated and comprehensive “spatial mindset” across sectors in Abu Dhabi through a geospatial portal and other initiatives.

EFFECTING CHANGE

On Wednesday, the third day of Eye on Earth 2011 convened under the theme “effecting change” and featured plenary sessions, which included a number of presentations from keynote speakers, as well as seven panel debates on key thematic areas such as oceans, financing, water security and “innovative cities.” Julia Marton-Lefèvre, Director General, International Union for Conservation of Nature (IUCN), and Russell Mittermeier, President, Conservation International, opened the morning plenary, presenting an overview of the day’s programme.

Stephen Emmott, Microsoft, said that actionable data, rather than more data sharing, is needed to address species extinction, global pandemics, ecosystem collapse and other pressing planetary problems. He said that actionable data will be derived from a new kind of precise, predictive, defensible science of complex natural systems, and offered Microsoft’s Antibes and Mandingley models as examples.

Photographer Yann Arthus-Bertrand discussed how he uses aerial photography to change the perspective of others about the planet, its ecosystems, and mankind’s impact on the Earth and its fellow inhabitants. He showed a portion of his copyright-free film “Home,” intended to teach people to respect “this work of art we live on.” He also showed a video from his latest project “6 Billion Others,” which interviews people from around the world about their aspirations and perspectives.

Henry Puna, Prime Minister of the Cook Islands, addressing participants on the importance of the ocean to Small Island Developing States (SIDS), announced the creation of one of the world’s largest marine parks. He said that the creation of the park was done without sufficient data and lamented that its steering committee, in the initial investigations of data for monitoring the park, has discovered a paucity of data, particularly relating to cross-sectoral issues and information beyond fishing, environment and pollution information. He called for these gaps to be addressed, urged that data be made freely available and asked that affordable technology to use the data be made available.

Malcolm Johnson, Head of Standardization, International Telecommunications Union (ITU), outlined ITU’s goals of bringing the benefits of information and communication technologies (ICTs) to the world and actively promoting the use of ICTs to tackle environmental challenges. He said that ICTs can assist in accessing and widening the use of environmental data and information, engaging citizens in environmental protection and accelerating innovation. He noted that on the path to Rio+20, data will ensure informed decision making for a sustainable future and suggested that global connections through ICTs will be instrumental in addressing sustainable development challenges.

OCEANS AND BLUE CARBON: In the morning, Sylvia Earle, National Geographic, opened the panel session on Oceans and Blue Carbon and identified blue carbon stored in coastal and marine ecosystems as a critical but underappreciated component of the global carbon cycle. She said that Eye on Earth 2011 highlights the need to gather, organize and disseminate data for accounting for blue carbon in decision making. She also emphasized the ethical responsibility humans have to the future and the community of all Earth’s creatures, saying it is imperative to eliminate the heavy-handed methods of extracting wildlife from oceans.

Moderated by Philippe Cousteau Jr, EarthEcho International, the panel discussed: the importance of blue carbon and oceans from the perspective of SIDS; the science and economics behind valuing mangroves, salt-water marshes and other ocean systems; and successful projects in preserving blue carbon. Rolph Payet, President, University of Seychelles and Special Advisor to the President of the Seychelles, said that for SIDS, oceans and their resources are inextricably linked to the everyday life of those living on the islands. He noted that any stress or change to the oceans and the climate is thus quite apparent to them.

Peter Prokosch, Managing Director, UNEP/GRID-Arendal, lauded the inclusion of blue carbon as a part of the vernacular. Citing the example of the Wadden Sea, an area that has been seen as potentially suitable for agriculture if reclaimed, but is now protected in parts, he called for a halt to land reclamation on coastlines. Thabit Abdel Salaam, EAD, highlighted a project in the UAE which sought to replant mangroves, noting that mangrove coverage has increased as a result. He said that this was due in part to a successful partnership with government that was formed on the basis of sound science.

Beatrix Schmuelling, Masdar Institute, suggested that practitioners look at tools and mechanisms available to conserve oceans, such as the Clean Development Mechanism, which is one method for obtaining an alternate income stream for communities that rely on the sea. All the panelists agreed that community involvement is vital, with Carl Lundin, IUCN, saying that although there is much more to be understood, social resilience needs to be ensured. In closing, Earle stressed

the need for increasing the coverage of marine protected areas, highlighting the interconnectivity of all natural ecosystems on the planet.

DISASTER MANAGEMENT: RESILIENCE, REDUCTION, RESPONSE AND RECOVERY: Lelei LeLaulu, Chairman, Foundation for the Peoples of the South Pacific, moderated this panel. He described the potential to “marry” traditional knowledge with modern technology for coping better with natural disasters. Helena Molin Valdés, Deputy Director, UN International Strategy for Disaster Reduction, said that urban sustainability depends on making resilience to natural disasters central to urban planning and development. She noted that resilient cities rely on quality data for risk assessment, planning and response, which must be grounded in the knowledge about specific areas held by local communities. She urged the Summit to foster initiatives that work with local governments and communities to develop information tools to improve areas such as risk assessment and city-to-city learning.

Milen Dyoulgerov, Global Facility for Disaster Reduction and Recovery (GFDRR), said that one of the challenges for disaster response is building the capacity to absorb and access information and turn it into guidance for responding to disasters. He also called for enabling country- and local-level policy makers to access the tools demonstrated during the Summit. Juliana Rotich, Ushahidi, providing an overview of her organization’s work, said that Ushahidi is designed to complement the systems of first-responders such as the Red Cross/Red Crescent and aids in separating out the information contained in the “noise.” Matthias Schmale, International Federation of Red Cross and Red Crescent Societies, noted a need for behavioral changes, including for policy makers to heed warnings and take action for disaster mitigation.

Molin Valdés lamented that traditional knowledge has not yet been integrated sufficiently into disaster risk reduction. She said that there is a need to change mindsets to respect, learn from, adapt and adopt traditional knowledge as a science. She also noted the importance of accessing and analyzing data for development planning and sustainable development, particularly in the run-up to Rio+20. Dyoulgerov called for focusing on “meaningful technology” that can be used at the local and national levels.

Panelists highlighted local solutions for disaster risk reduction and emergency response, with Rotich saying that funds should be invested in infrastructure for organizations and issues in the environment that are not traditionally focused on. She stressed that the general population must understand its impact on the environment and potential local community responses.

FINANCING THE FUTURE: David Jhirad, Johns Hopkins University, moderated this panel on Wednesday morning. The panel focused on exploring innovations in integrating finance, governance and technology for sustainable infrastructure development. Panelists discussed successful cases of public-private partnerships, noting the potential for such strategies to leverage private capital for infrastructure that creates jobs, promotes social stability, reduces carbon emissions and promotes other development goals.

Warren Evans, World Bank, pointed to the Clean Technology Fund and the Middle East and North Africa Concentrated Solar Power Scale-up Programme. Marcelo de Andrade, Earth Capital Partners, described a US\$ 7 billion hydropower project that attended to the welfare of 20,000 relocated families as part of a participatory 50-year plan, which

brought together development and investment banks through innovative financial mechanisms. Karim Allaoui, Islamic Development Bank, indicated the Bank’s success in creating new models for South-South cooperation and forging new types of partnerships with financial intermediaries to deliver services at household level. A question-and-answer session with participants highlighted corruption and lack of public participation as barriers to harnessing investment capital for development. De Andrade said transparency, strong governance and community empowerment are critical to managing large-scale infrastructure investments, and Evans highlighted the need to adhere to performance-based financing. Allaoui said political will and consensus are key, and cautioned against an overreliance on complex financial instruments that treat money as a commodity.

INNOVATIVE CITIES: DESIGNING FOR RESILIENCY AND CHANGE: Jan Hartke, Clinton Foundation, moderated the Wednesday afternoon panel session, which considered how geospatial technologies are being utilized in urban planning, particularly in making cities more resilient to climate change and natural disasters. Naeema Al Zarouni, Abu Dhabi Urban Planning Council, explained how geospatial data is being utilized to plan the growth of Abu Dhabi until 2030, and to measure its success in achieving sustainability goals. She emphasized that the Council is developing indicators to measure environmental, social, economic and cultural sustainability. She also described the Pearl Rating System which is used for rating buildings and the CitySense geospatial mapping system used in urban planning decisions.

Michael Bloomberg, Mayor, New York City, US, in a video address to the Summit, explained his city’s efforts to reduce energy consumption and GHG emissions, primarily through retrofitting buildings, and to measure and report on progress. He also noted, in his role as chair of the C40 Cities Climate Leadership Group, the recent report on the carbon output of C40 cities.

Richard Fedrizzi, President, World Green Building Council, discussed how certifying green buildings and retrofitting buildings to be more energy- and water-efficient are gaining wide acceptance around the world, with 89 countries now having green building councils and 40% of Leadership in Energy and Environmental Design (LEED) certifications from outside the US. He noted the creation of a Building Performance Partnership to provide “report cards” on the energy being used in LEED-certified buildings, and a new iPhone application that allows users to check on building performance. Susanne Salz, ICLEI - Local Governments for Sustainability, discussed ICLEI’s efforts since 2002 to get cities to assess and improve their resilience, with a recent focus on resilient buildings and logistical systems. Aspasia Camargo reported on how Rio de Janeiro is trying to address disaster response and improve the city’s resilience. She stressed that in order to build resilient cities, large amounts of environmental, social and economic data are needed. In response to the moderator’s question about the significance of the Summit, Fedrizzi expressed the hope that it will become a recurring chance for high-level thought leaders to come together, but cautioned against “information for information’s sake,” stressing it was more important to generate information that can feed into and spur action.

WATER SECURITY: KNOWING WHAT WE NEED TO KNOW: Najib Saab, Secretary General, Arab Forum for Environment and Development, moderating the panel

session, discussed water supply and demand management, the place of international agencies, information systems, the commonalities and differences between the Middle East and other regions, the merits of legislation versus awareness-building, institutional fragmentation and the particular challenges facing the UAE.

Mohamed Al Madfaie, EAD, defined “water security” as having an acceptable quantity and quality of water for livelihoods and highlighted its importance, stating that it is a societal priority. He stressed that currently, water security is more important to the UAE than oil. He provided an overview of the importance of data for water security, noting that partnerships in the MENA region allow the sharing of, and collaboration on data, data modeling and predictions. He noted that there is a need to consider water security and water variability over space and time, and concluded by emphasizing the linkages between food and water and energy security, suggesting that they need to be dealt with in a holistic manner.

Asma El Kasmi, Director, Arab Water Academy, stated that water planning must encompass political and institutional innovation across sectors and national borders, pointing to the Academy’s programmes in water diplomacy and training of senior water professionals as examples.

Saab said UNEP and other international agencies should not hesitate to challenge poor national policies, while Mick Wilson, UNEP, stressed that they can assist in data gathering and monitoring but must respect the nations to which they are accountable. Wilson added that UNEP can facilitate public scrutiny by helping citizens use and understand data, and that it can urge countries to exchange data internationally, for example, by calling on Australia and the Middle East to share data with the UN Global Environment Monitoring System (GEMS)/Water Programme.

Mohammed Dawood, EAD, said that the supply-side focus of the last 20 years must be complemented with a demand-side focus, including such challenges as financing the distribution of centralized treated water to distant farmlands, and shifting to dry landscaping. Al Madfaie gave the Abu Dhabi First State of the Environment Report, the first in the region, as an example of encouraging learning, awareness and exchange of key indicators among countries.

NETWORK OF NETWORKS: BEYOND

INFORMATION TECHNOLOGY: Harlen Onsrud moderated the Wednesday afternoon panel. José Achache, Director, Group on Earth Observations (GEO), noted that the vision from WSSD was to create a world where decisions and actions are informed by coordinated, comprehensive and sustained Earth observations. He noted that although the capacity to observe Earth’s systems exists, many of the observation networks operate on different platforms and thus may not be able to “communicate” with one another. He said that GEO is able to address this by providing a platform that can access these different systems and communicate with all of them. Looking forward to Rio+20, he highlighted the vision of extending GEO by creating a network of networks that, for example, will include the work of NGOs, which has never been addressed before.

Eric van Praag, Geospatial Information for South American Integration (GeoSUR), described the evolution of GeoSUR. He said GeoSUR has issued a report on lessons learned and is contemplating whether its experience can be replicated elsewhere in the world. Steven Ramage, Open Geospatial Consortium, provided an overview of his organization and stressed that the key to building a network of networks is

to understand organizational behavior and what incentives bring people together to work and share together. Alessandro Annoni, Joint Research Centre, European Commission, discussed the development of the Infrastructure for Spatial Information in Europe Programme (INSPIRE), stressing that it is different from other networks in that it is based on a legal framework, built in an open and inclusive fashion, on top of 27 very different national data infrastructures.

Asked by Onsrud about the challenges faced when building a network of networks, Achache listed interoperability, standards and formats, reconciling different national data policies, producing data in a timely fashion for users, building capacity, and semantics, that is, ensuring that no matter how a query is formulated, it is understood by the system and the appropriate answer is supplied. Ramage mentioned the communication gap between technicians generating the data and the end users. Annoni noted that when INSPIRE was started, they thought interoperability would be the biggest challenge, yet they found that reconciling 27 national data policies proved harder. Van Praag explained that since GeoSUR does not have a legal mandate like INSPIRE, incentives should be found to get agencies involved. He also pointed out that in Latin America, hardware availability and reliability can be a problem, and that GeoSUR is therefore proposing the use of cloud computing services for open-source geospatial services.

Hypothetical DEBATE with Geoffrey Robertson

QC: Geoffrey Robertson QC moderated a “hypothetical” debate involving 14 leading EOE participants, among them Sylvia Earle, Julia Marton-Lefèvre, Jacqueline McGlade, Razan Khalifa Al Mubarak, Henry Puna, and John Scanlon. Robertson guided the participants through a creative role-play, where each represented a different kind of societal actor in a fictitious small island nation struggling to balance the complex and often unpredictable tradeoffs inherent in conservation and development. The role-play interwove dilemmas over threatened species and cures for cancer, scientific uncertainty and demands for action, spiritual values and mining profits, and national sovereignty and global pandemic. The cast of characters juggled the various government, civic, business, media and scientific perspectives in play, finding opportunities to forge unexpected alliances always amid insufficient information. Robertson summarized the role-play with reference to the tragedy of the commons, whereby the various dilemmas faced by this fictitious island stood for other pressing problems like climate change, illustrating the need for better information and possibility of acting together for the common good.

DELIVERING THE VISION

On Thursday, the final day of Eye on Earth 2011 convened under the theme “delivering the vision” and featured plenary sessions with a number of presentations from keynote speakers to conclude the Summit, announce the five thematic Special Initiatives and the three foundation Special Initiatives, and highlight the way forward. Addressing the plenary in the morning, Fred Moavenzadeh, President, Masdar Institute, explained the origins of the Institute. He said Masdar takes a holistic, multi-dimensional approach in its mission to help develop the technologies necessary to reduce the impact of climate change, considering the need to foster related financial, human and intellectual capital, and focusing on spurring the creation of markets. He likened Masdar’s catalytic role to that of the National Aeronautics

and Space Administration (NASA) during the space race, creating its own value chain. He discussed Masdar's awareness-raising efforts, its linkages with universities, and its role in the European Union-Gulf Cooperation Council Clean Energy Network. He stressed that collaboration and information sharing is important to Masdar because it wants to complement, not duplicate, work underway elsewhere.

Julia Marton-Lefèvre, Director-General, IUCN, discussed what is known about "the catalogue of life" and its gaps. She stressed that even with these gaps, it is still known that one in four mammals, two in five amphibians and one in eight birds are at risk. She underscored that if the state of the planet is to be improved, the best diagnosis possible is needed. She said an investment of just US\$60 million will transform the Red List of threatened species into a true barometer of life on Earth. She ended by underscoring that ways to utilize new media to communicate the diverse threats to biodiversity must be found, and that perfect information regarding the planet's species before taking action is not needed as the data already indicates that action should be taken.

Mathis Wackernagel, President, Global Footprint Network, stressed that one common denominator across the many dimensions of global environmental decline is that humans take more from the planet than it can regenerate. He explained that holistic solutions must begin with two questions: how large is the Earth's biological capacity?; and how much of Earth's biological capacity do humans use? He described the Ecological Footprint as a powerful accounting tool to answer these questions, and that it indicates that natural capital is declining globally because humans use approximately 50% more of the Earth's resources than the planet can regenerate each year. Wackernagel linked the loss of natural capital to declines in national economic competitiveness, calling such capital the only currency backed up in hard reality.

Maher Chebbo, Systems, Applications, and Products in Data Processing (SAP), presented smart grid initiatives that are transforming energy from a commodity into a flow optimized and managed like traffic. Chebbo explained how the smart grid facilitates intelligent energy optimization by connecting citizens, devices and advanced analytics that facilitate real-time decisions. He described a number of efforts that are making energy optimization a reality, including Germany's EUR140 million E-Energy smart grid demonstration project and the EU's Green eMotion electric vehicle initiative.

Ed Parsons, Google, set forth the challenge of stirring human emotion for real-world change by building compelling stories from the vast amounts of data that now exists. He said that data abstracted as maps, figures and graphs, while important, fails to motivate changes in human behavior and belief. Parsons cited the one billion people who have downloaded Google Earth as evidence that geo-literacy is greater than ever, yet indicated that the means to harness this powerful capacity remains an open question. Parsons shared Google projects from post-disaster Haiti and Japan, illustrating the possibility for spatial data to convey emotive narratives.

Lalanath de Silva described current threats like climate change and financial meltdown as more complex and insidious than the perils of the Cold War, asking why they remain perplexing despite the power of modern information and technology. He suggested that partnerships among business, people and corporations can navigate this complex world. De Silva said successful partnerships adhere to three

ancient, time-tested principles: transparency, participation and accountability. He implored participants to: advance these partnership principles by joining The Access Initiative; support Brazil's call for a global convention on Principle 10; back the Bali Strategic Plan for Technology Support and Capacity-Building; and support giving UNEP a robust mandate to help implement Principle 10 around the world.

Teuea Toatu, Executive Director, Phoenix Islands Protected Area (PIPA) Conservation Trust, Kiribati, read a statement from Kiribati President Anonte Tong discussing the threat his small Pacific island nation faces from climate change and his dismay that even with all the data and information already available, there is still disagreement on the way forward regarding climate change. He lamented that Kiribati's leaders often have to make decisions based on little or no environmental data. He also discussed the value of PIPA as a "natural laboratory" for assessing the impacts of climate change, and its role as founding member of the Pacific Oceanscape conservation and management initiative. He said that while both can provide the raw material for research, they need partners with the research capital to generate data and information from it.

Daniel Edelson suggested that while scientific knowledge of the environment has increased, public understanding of it has decreased. He suggested this is not only because threats such as climate change and biodiversity loss are abstract and not easily observable, but also because people have lost their connection to, and understanding of, natural systems and processes, an "obstacle that no amount of data can overcome." Edelson discussed the National Geographic Society's BudBurst citizen science project aimed at rebuilding this linkage with natural processes. He suggested a global version of this concept, an application utilizing the EOE platform to: link citizen scientists across the world monitoring their environment and natural processes; create tools that support citizen science communities of learners; and support corps of environmental education specialists.

Jacqueline McGlade discussed some of the challenges faced in generating and managing environmental information, such as keeping pace with change or communicating problems in a way that make them concrete to the average person. She stressed that if the world is ever to decouple economic growth from carbon emissions, there is a need for solid information on which to base key decisions. McGlade noted that Europe will begin publishing national environmental accounts, and discussed the development of the Shared Environmental Information System. McGlade urged getting the average citizen involved, perhaps through experiments in crowdsourcing and citizen science, and through social media. She invited everyone to join the EEA in participating in the EOE Network, so that "we can all connect across our silos."

Al Mubarak presented the EOE Summit Declaration, which was signed by herself, Rashid Ahmed Bin Fahad and Peter Gilruth, UNEP.

Simran Vedyvas, a youth delegate from the UAE, noted that the discussions held over the course of Summit had been "eye-opening." She said that participants should ask themselves "what must we do for the environment?" Stating that whatever the answer is, she said the time to act is now, and that there is an urgent need to deliver on the promises made.

In a video message, Yugratna Srivastava, Asia-Pacific Youth Ambassador, lamented that the youth are becoming increasingly concerned with the lack of action to solve environmental problems, calling on governments to create

national green economy plans, meet the MDG targets, ensure human rights and access to education and employment, and incorporate social and environmental issues into economic policies. She urged that governments be held responsible for their actions and implored the media to focus more on environmental issues. She expressed the hope that Rio+20 will have concrete outcomes and actions.

Elissar Sarrouh, UN Resident Coordinator for the UAE, noted the unique opportunity presented by hosting the Summit. She called for collaboration to discuss and debate the sustainability of lives, energy and the environment, and urged support for the Energy for All Initiative, which will be launched in the UAE in early 2012.

Cathrine Armour announced the establishment of five thematic initiatives: Eye on Water Security; Eye on Disaster Management; Eye on Community Sustainability; Eye on Blue Carbon; and Eye on Biodiversity. She also announced the establishment of three foundation initiatives: Eye on Environmental Education; Eye on Global Network of Networks; and Eye on Access for All. She explained that these collaborative initiatives are being established to further the EOE mission and vision.

Daniel Reifsnnyder, US, noted the US's strong support for the initiatives announced. He said much of the US's experience and technological prowess in data gathering and analyzing comes from over 40 years of trial and error, stating that the problems faced today are the same problems faced decades ago. He outlined their involvement in a number of partnerships and collaborations to build capacity and develop tools for gathering, accessing and using data across the world. He expressed the hope that participants would meet in two years time to take stock and determine the next steps forward.

Gilruth said that UNEP views monitoring and reporting on the environment as critical. He noted the need to collect better data and improve the production and use of information and emphasized the increasingly important role of the citizen in data gathering. He expressed UNEP's commitment to assisting in convening platforms such as Eye on Earth 2011, and using the results of these in a UNEP reporting system for monitoring the state of the environment.

Al Mubarak closed the plenary with a reflection on the diversity, breadth and global importance demonstrated at Eye on Earth 2011. She marked the Summit as a transition from a moment to a movement of a unified community, whose future depends on shared commitment, responsibility, accountability and action. Al Mubarak recounted the success of the EOE Summit Declaration and special initiatives, and invited participants to return to Abu Dhabi for the next Eye on Earth Summit. The meeting was closed at 2.15pm.

EYE ON EARTH SUMMIT DECLARATION

The Eye on Earth Summit Declaration recognizes the need for accessing timely, credible and relevant observations and information from a wide array of actors to enable the development and implementation of goals, targets and indicators to ensure the advancement of sustainable development. Recalling Principle 10 of the Rio Declaration as well as the Bali Strategic Plan for Technology Support and Capacity-Building, it highlights the opportunity presented by Rio+20 to renew political commitment for the role of information in advancing sustainable development.

Among other things, the Summit Declaration agrees to advance EOE collaboration based on:

- a cooperation agenda that is flexible, balanced, purpose-driven, issue-focused and time-bound, as well as durable and respecting of the diverse range of stakeholders and their governance structures so as to build trust among partners;
- cooperation modalities inspired by the subsidiarity principle, that is, that functions are performed in a distributed manner by those best placed to do so and information is kept close to its source so as not to lose knowledge of its use and limitations;
- effective mechanisms for collecting, managing and disseminating necessary environmental information, with the responsibility for quality assurance resting with those who collect or originate the data;
- information availability that avoids unnecessary duplication in data collection, underpins reporting obligations, and supports decision making; and
- public access to environmental information, with any exemptions being defined in law and interpreted narrowly with regard to the public interest, so that access to information is timely, effective and affordable for all interested users.

The Declaration further:

- agrees to work with the UN to establish a forum for cooperation among sub-global and thematic environmental information networks so as to further enhance their connectivity and effectiveness for supporting assessments, information exchange and decision making for sustainable development;
- decides to work with GEO and other relevant initiatives and interested partners to support the further development and expansion of existing interoperability standards for data and information exchange, as well as a global approach for the provision of web-based platforms in support of information exchange;
- resolves to support the development of adequate institutional and legislative enabling conditions for furthering the implementation of Principle 10 based on, among others, the UNEP Guidelines for the Development of National Legislation on Access to Information, Public Participation and Access to Justice in Environmental Matters;
- commits to engage in new initiatives and strengthen existing ones, for technical cooperation for capacity building and technology support for access to, and exchange of, information in developing countries and countries with economies in transition to a market economy;
- calls on UNEP and all actors involved in development cooperation to assist developing countries and countries with economies in transition, when requested, through targeted capacity building programmes in their efforts to develop adequate national legislation and support for public access to information in line with Principle 10;
- declares intent for further developing the EOE community, to progress the Special Initiatives and other such projects and programmes, both existing and in the future, including the development of national capacities;
- calls on governments, UN bodies, other international organizations, donors, civil society and the private sector, to further contribute to the implementation of the Special Initiatives agreed by the Summit and the actions set out above; and
- resolves to meet before the end of 2013 to review progress in implementing the Declaration and consider directions for further work.

UPCOMING MEETINGS

UNCSD Informal Consultations: The UNCSD Preparatory Committee will hold a series of informal discussions and negotiations on the zero draft of the outcome document in January, February, March and April 2012. **dates:** 16-18 January 2012; 13-17 February 2012; 19-23 March 2012 and 30 April - 4 May 2012 **location:** UN Headquarters, New York **contact:** UNCSD Secretariat **email:** uncsd2012@un.org **www:** <http://www.uncsd2012.org/rio20/>

Intergovernmental Meeting to Negotiate and Endorse GEO-5 Summary for Policy Makers: The intergovernmental meeting to negotiate and endorse the GEO-5 Summary for Policy Makers is tentatively scheduled to take place from 23-25 January 2012 **dates:** 23-25 January 2012 [tentative] **location:** TBC **www:** <http://www.unep.org/geo/>

EuroGEOSS 2012: EuroGEOSS 2012 will provide a forum for developers, users and decision makers working with advanced multi-disciplinary information systems to improve science and decisions for complex societal issues. **dates:** 25-27 January 2012 **location:** Madrid, Spain **contact:** José Miguel Rubio Iglesias **phone:** +34-91-597-9671 **email:** jmrubio@fomento.es **www:** <http://www.eurogeoss2012.eu/>

Rio+2.0: Bridging Connection Technologies and Sustainable Development: This invitation-only event, hosted by the US Department of State and representing the US Government's premier event in advance of the UNCSD will focus on the use of connection technologies to advance sustainable development solutions in the fields of health, environment, agriculture and sustainable economic growth. Participants will be asked to define "innovation challenges" for how connection technologies can help advance cross-cutting sustainable development problems, with outcomes to be presented at the UNCSD. **dates:** 2-4 February 2012 **location:** Palo Alto, US **www:** <http://www.uncsd2012.org/rio20/?page=viaw&nr=470&type=13&menu=23>

Planet Under Pressure: New Knowledge toward Solutions: This conference will focus on solutions to the global sustainability challenge. It will discuss solutions to move societies on to a sustainable pathway and provide scientific leadership towards the UNCSD. **dates:** 26-29 March 2012 **location:** London, United Kingdom **contact:** Jenny Wang **phone:** +86-10-8520-8796 **email:** Jen.wang@elsevier.com **www:** <http://www.planetunderpressure2012.net>

Third Intersessional Meeting for UNCSD: The final intersessional meeting for the UNCSD will be convened in March 2012. **dates:** 26-27 March 2012 **location:** UN Headquarters, New York **contact:** UNCSD Secretariat **email:** uncsd2012@un.org **www:** <http://www.uncsd2012.org/rio20/>

Resilient Cities 2012: The Third World Congress on Cities and Adaptation to Climate Change, also known as Resilient Cities 2012 or the Third Global Forum on Urban Resilience and Adaptation, is a platform to provide local governments with the keys to smarter infrastructure, better urban planning and state-of-the-art tools to improve the future of cities. **dates:** 12-15 May 2012 **location:** Bonn, Germany **contact:** ICLEI – Local Governments for Sustainability **phone:** +49-228 -976-299-28 **fax:** +49-228-976-299-01 **email:** bonn2012@iclei.org **www:** <http://resilient-cities.iclei.org/bonn2012/home/>

2012 Tech4Dev International Conference: As a UN Educational, Scientific and Cultural Organization (UNESCO) Chair in Technologies for Development, the Cooperation and Development Center (CODEV) will host an international conference concerning "Technologies for Sustainable Development: A Way to Reduce Poverty?" This conference

will look at how science and technology can support both sustainable development and the MDGs in developing and emerging countries. **dates:** 29-31 May 2012 **location:** Lausanne, Switzerland **contact:** Jean Claude Bolay **phone:** +41-216-936-048 **email:** Tech4Dev@epfl.ch **www:** <http://cooperation.epfl.ch/2012Tech4Dev>

Third PrepCom for UNCSD: The third meeting of the Preparatory Committee for the UNCSD will take place in Brazil just prior to the conference. **dates:** 13-15 June 2012 **location:** Rio de Janeiro, Brazil **contact:** UNCSD Secretariat **email:** uncsd2012@un.org **www:** <http://www.uncsd2012.org/>

UN Conference on Sustainable Development: The UNCSD will mark the 20th anniversary of the Earth Summit, which convened in Rio de Janeiro, Brazil in 1992. **dates:** 20-22 June 2012 **location:** Rio de Janeiro, Brazil **contact:** UNCSD Secretariat **email:** uncsd2012@un.org **www:** <http://www.uncsd2012.org/>

Worlds Within Reach: From Science to Policy: This event will mark the 40th anniversary of the International Institute for Applied Systems Analysis (IIASA), and will focus on the global challenges brought by globalization, fundamental shifts in economic and political power, environmental challenges, and unpredictable social conflict. It will also focus on the research needed to address the environmental, social, technological and economic challenges they pose, and look at ways of resolving them. **dates:** 27-29 July 2012 **location:** Vienna and Laxenburg, Austria **contact:** IIASA Conference Secretariat **email:** conference@iiasa.ac.at **www:** <http://www.iiasa.ac.at/conference2012/index.html>

GLOSSARY

AGEDI	Abu Dhabi Global Data Initiative
CITES	Convention on International Trade in Endangered Species of Wild Flora and Fauna
EAD	Environment Agency – Abu Dhabi
EEA	European Environment Agency
Esri	Environmental Systems Research Institute
GEF	Global Environment Facility
GEO	Group on Earth Observations
GeoSUR	Geospatial Information for South American Integration
GHGs	greenhouse gases
GIS	geographic information system
ICT	information and communication technology
INSPIRE	Infrastructure for Spatial Information in Europe Programme
JPOI	Johannesburg Plan of Implementation
LEED	Leadership in Energy and Environmental Design
MDGs	Millennium Development Goals
MENA	Middle East and North Africa
SIDS	small island developing states
UAE	United Arab Emirates
UNCED	UN Conference on Environment and Development ("Earth Summit")
UNCSD	UN Conference on Sustainable Development ("Rio+20")
UNEP	UN Environment Programme
WSSD	World Summit on Sustainable Development