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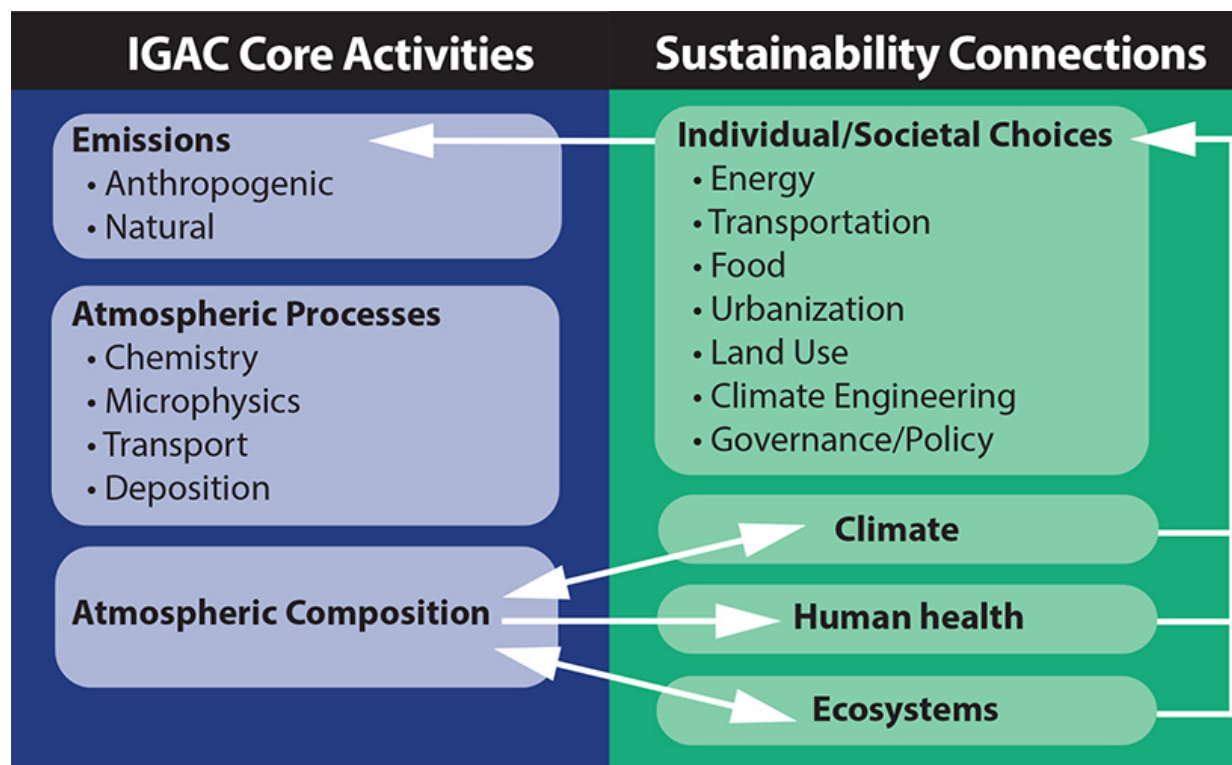
**International Global Atmospheric Chemistry (IGAC) Project
International Program Office (IPO)**

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Accomplishments

1. Project Goals

The International Global Atmospheric Chemistry (IGAC) Project was formed in 1990 to address growing international concern over rapid changes observed in Earth's atmosphere. IGAC operates under the umbrella of the International Geosphere Biosphere Programme (IGBP) and is jointly sponsored by the international Commission on Atmospheric Chemistry and Global Pollution (iCACGP). IGAC's mission is to **coordinate and foster atmospheric chemistry research towards a sustainable world**, which is achieved by integrating, synthesizing, guiding, and adding value to research undertaken by individual scientists through initiating new activities, acting as a hub of communication for the international atmospheric chemistry research community, and through building scientific capacity. IGAC promotes international collaborations and co-design of scientific knowledge required for responding effectively to the challenges and opportunities of global environmental change and sustainability by enhancing the connection between strong laboratory, field and modeling studies on emissions, atmospheric process and atmospheric composition to the larger Earth system research community.



IGAC's priorities and activities are guided and, in many cases, implemented by an international volunteer Scientific Steering Committee (SSC). It is the IGAC IPO's responsibility to implement the priorities of the organization set forth by the SSC in collaboration with volunteer scientists from the international atmospheric chemistry community. This annual report describes the accomplishments of IGAC and the IGAC IPO from July 2014 - June 2015.

2. IGAC Activities

An important role for IGAC is to identify areas in fundamental and sustainability research that require synthesis and integration of research across disciplines and/or geographical boundaries and to facilitate their implantation. Members of the IGAC SSC or members of the IGAC community are invited to identify areas in atmospheric chemistry that are in need of such an organizational framework to help address high-priority “big-picture” questions in atmospheric chemistry. IGAC Activities provide the international organization that is necessary to conduct atmospheric chemistry research towards a sustainable world. Following is a list of IGAC Activities that were active during the reporting period.

Atmospheric Composition and the Asian Summer Monsoon (ACAM)

Jointly Sponsored by WCRP-SPARC

Co-Chairs: Laura Pan, National Center for Atmospheric Research, USA
Jim Crawford, NASA Langley Research Center, USA

ACAM is an emerging IGAC/SPARC activity that will be developed more fully over the next two years. Scientifically, the initiative focuses on four themes, each representing a key aspect of the connection between atmospheric composition and Asian monsoon dynamics: (1) Emissions and air quality; (2) Aerosols and clouds; (3) Convection and chemistry; (4) UTLS Response to the Asian Monsoon.

Air Pollution & Climate: A Science-Policy Dialogue

Jointly Sponsored by IGBP

Co-Chairs: Kathy Law, LATMOS/IPSL, Paris, France
Paul Monks, University of Leicester, UK

The IGBP/IGAC Air Pollution & Climate initiative seeks to open a science-policy dialogue on the air pollution and climate change challenge. There is still a separation between air pollution and climate change in both the policy and scientific communities. As with many issues, there also exists a divide between the scientific and policy communities that hinders communication and understanding. This activity will come to an end in 2015 upon the publication of a Strategic Framework for Integrated Programs on Air Pollution and Climate Change. The Strategic Framework is being prepared for publication in *Current Opinion in Environmental Sustainability*.

Chemistry-Climate Model Initiative (CCMI)

Jointly sponsored by WCRP-SPARC.

Co-Chairs: Jean-Francois Lamarque, NCAR, ACD, Boulder, CO, USA
Michaela Hegglin, University of Redding, UK

CCMI is coordinating model evaluation and associated modeling activities between the domains of chemistry and climate dynamics. To best reflect current understanding, CCMI seeks to frame scientific inquiry in this arena through an integrated stratosphere-troposphere approach. These efforts are meant to culminate in increasingly accurate global atmospheric models to be used in the WMO/UNEP Scientific Assessment of

Ozone Depletion and the IPCC Sixth Assessment Report (IPCC AR6). Visit <http://www.met.reading.ac.uk/ccmi/> for more information.

Deposition of Biogeochemically Important Trace Species (DEBITS)

Jointly sponsored by WMO

Chair: Kobus Pienaar, North-West University, South Africa

Wet and dry deposition of chemical species to the Earth's surface plays an essential role in controlling the concentration of gases and aerosols in the troposphere. The chemical composition of atmospheric deposition provides important information on many interacting physical and chemical mechanisms in the atmosphere such as emission sources, atmospheric dynamics and transport, atmospheric removal processes, and nutrient cycling in ecosystems. Long-term research on deposition thus provides critical information on natural and anthropogenic influences on the atmosphere and provides information on the temporal and spatial evolution of atmospheric chemistry.

Fundamentals of Atmospheric Chemistry

Chair: Jon Abbatt, University of Toronto, Toronto, Canada

Fundamental atmospheric chemistry research provides essential data used in all practical (laboratory, field measurements, remote sensing) and theoretical (climate modeling, pollution modeling, cloud microphysics) aspects of scientific endeavor. These studies encompass a diverse range of areas including gas-phase kinetics, heterogeneous chemistry, chamber studies, photochemistry, spectroscopic and thermodynamic chemical data, and meteorology that together, with the attendant measurement techniques, deliver the data and the constant evolution required to work in the atmospherically relevant physical and chemical regimes. The evolution of atmospheric chemistry research has resulted in more emphasis on field research and modeling than on fundamental research typically done in the laboratory. To demonstrate the importance of fundamental research, IGAC integrates Fundamental Atmospheric Chemistry into all of its activities and includes a session on fundamentals as its biennial conference.

Global Emissions Initiative (GEIA)

Jointly sponsored by iLEAPS, AIMES

Co-Chairs: Greg Frost, CU/CIRES and NOAA/ESRL/CSD, USA
Leonor Tarrason, NILU, Norway

Quantification of chemical emissions into the air is a key step in explaining observed variability and trends in atmospheric composition and in attributing these observed changes to their causes on local to global scales. Accurate emissions data are necessary to identify feasible controls that reduce adverse impacts associated with air quality and climate, to track the success of implemented policies, and to estimate future impacts. GEIA is a community effort that builds bridges between environmental science and policy, by bringing together people, data, and tools to create and communicate the

highest quality information about emissions. GEIA seeks to enhance access to emissions data, facilitate analysis to improve the scientific basis for emissions information, and strengthen the emissions community.

Halogens in the Troposphere (HitT)

Jointly sponsored by SOLAS

Co-Chair: Roland von Glasow, University of East Anglia, UK

The primary objective of HitT is to determine and quantify the importance of reactive halogen compounds (RHCs) in tropospheric chemistry and climate forcing. Key themes are the influence of RHCs on the oxidative capacity of the atmosphere, the ozone budget, as well as in aerosol nucleation and growth. The goal of HitT is to facilitate international collaboration between laboratory, field, and model activities regarding tropospheric halogen chemistry especially in the following domains: polar regions, salt lakes, marine boundary layer (both remote and coastal), volcanoes, free troposphere, and urban areas.

Interdisciplinary Biomass Burning Initiative (IBBI)

Jointly sponsored by iLEAPS and WMO

Co-Chairs: Johannes Kaiser, ECMWF, Reading, UK

Melita Keywood, CSIRO, Melbourne, Australia

Biomass burning changes the land surface drastically and leads to the release of large amounts of trace gases and aerosol particles that play important roles in atmospheric chemistry and climate. In addition, there is large uncertainty on how climate change and global change will impact the frequency, intensity, duration, and location of biomass burning in the short- and long-term making their emissions a large source of uncertainty of future atmospheric composition. Therefore biomass burning and its emissions need to be observed and modeled accurately for understanding the composition of the atmosphere and how it changes at different temporal and spatial scales. Significant gaps remain in our understanding of the contribution of deforestation and savanna, forest, agricultural waste, and peat fires to emissions. IBBI will help better quantify the present and future impact of biomass burning emissions on the composition and chemistry of the Earth's atmosphere.

Ocean-Atmosphere-Sea Ice-Snowpack (OASIS)

Jointly Sponsored by SOLAS

So-chairs: Faye McNeill, Columbia University, New York, NY USA

Tom Douglas, U.S. Army CRREL, Fairbanks, AK, USA

The Ocean – Atmosphere – Sea Ice – Snowpack (OASIS) brings together an international group of multidisciplinary field researchers, laboratory scientists, and modelers to study chemical and physical interactions and exchange processes between the title reservoirs, with a primary focus on the impact on tropospheric chemistry and climate feedbacks. A sub-activity of OASIS is Air-Ice Chemical Interaction (AICI). AICI assesses the significance of processes in the polar regions at the air-ice interface at

local, regional, and global scales by bringing together the laboratory, field, and modeling communities.

Polar Study using Aircraft, Remote Sensing, Surface Measurements, and Models of Climate Chemistry, Aerosols, and Transport (POLARCAT)

Co-Chairs: Andreas Stohl, NILU, Kjeller, Norway

Kathy Law, LATMOS/IPSL, Paris, France

POLARCAT addresses important gaps in knowledge of the climatically sensitive polar-regions, i.e., how they respond to a complex summation of surface exchange processes, vertical transport, unique Arctic air chemistry, and import from and export to mid-latitude regions. The activity incorporates intensive aircraft experiments, research ship cruises, monitoring activities at surface stations, ground-based remote sensing, balloon releases, satellite measurements, and a range of different models to test the understanding of Arctic processes against the measurement data sets. The task's efforts have led to a special issue in *Atmospheric Chemistry and Physics* and a review paper in the *Bulletin of the American Meteorology Society*.

Tropospheric Ozone Assessment Report (TOAR): Global metrics for climate change, human health and crop/ecosystem research

Chair: Owen Cooper, NOAA/ERSL, CU/CIRES, Boulder, CO USA

Tropospheric ozone is a greenhouse gas and pollutant detrimental to human and vegetation health. Since 1990 the anthropogenic emissions that react in the atmosphere to produce ozone have shifted from North America and Europe to Asia. This rapid shift, coupled with limited ozone monitoring in developing nations, has left scientists unable to answer the most basic questions: Which regions of the world have the greatest human and plant exposure to ozone pollution? Is ozone continuing to decline in nations with strong emission controls? To what extent is ozone increasing in the developing world? TOAR will address these questions by developing global metrics of ozone for climate change, human health and crop/ecosystem research.

3. IGAC National/Regional Working Groups

There are many regions of the world where there are many great scientists but often their research is conducted very independently and their results often don't reach the international community. However, as atmospheric chemistry research questions and their connections to societal issues become more regional, there is a strong desire to engage these scientists in order to incorporate their research and local knowledge of these regions of the world. Therefore, the goal of IGAC National/Regional Working groups is two fold; one is to create a strong cohesive community of atmospheric scientists in a specific nation/region that together have a sum greater than its parts, and the second is to connect the regional/national working groups to the larger IGAC community in order to foster international collaboration. IGAC currently is sponsoring the following working groups:

IGAC China Working Group

Chair: Tong Zhu, Peking University China

The sheer magnitude of China's landmass coupled with its growing and economically advancing population makes it critical to understand its role in air quality and climate on both regional and global scales. Chinese atmospheric chemists have been conducting frontier research for forty years in areas such as urban and regional air pollution and the climate effects and health impacts of air pollution. IGAC, through multilateral sponsorship, intends to more fully integrate Chinese research experience through its first national working group in China. The goals of the IGAC China Working Group are to:

- Encourage participation of Chinese atmospheric scientists to engage their leadership in international, multilateral atmospheric chemistry research programs;
- Strengthen ties with IGAC to facilitate the implementation of IGAC related research projects and tasks in China;
- Provide advice or consultation on major research plans in atmospheric chemistry in
- China to promote funding support;
- Promote academic exchange on atmospheric research in China and internationally, especially with IGBP China Working Groups; and
- Provide a platform in China to facilitate the academic growth and development of young researchers in atmospheric chemistry.

IGAC Americas Working Group

Co-Chairs: Nestor Rojas, Universidad Nacional de Colombia, Colombia

Laura Dawidowski, CNEA, Argentina

Under the guiding principle of providing equal opportunity for all scientists in the Americas, the IGAC Americas Working Group aims to build a cohesive network and foster the next generation of atmospheric scientists with the ultimate goal of contributing to development of a scientific community focused on building collective knowledge in/for the Americas. There is a priority on bringing together scientists from across the entirety of the Americas. To this end, the Americas Working Group seeks to:

- Improve the collaboration and communication between scientists in Latin America;
- Connect the Latin America community to the international community;
- Train and foster the next generation of scientists;
- Influence and promote a more proportionate distribution of funds for research
- Enhance visibility and credibility of scientists in Latin America

Japan National Committee

Chair: Hiroshi Tanimoto, National Institute for Environmental Studies, Japan

Under the Science Council of Japan, the IGAC-Japan National Committee has goals to:

- Encourage participation of Japanese atmospheric scientists to engage their leadership in international atmospheric chemistry research programs;
- Strengthen ties with IGAC to facilitate the implementation of IGAC related research projects by Japan;
- Provide advice or consultation on major research plans in atmospheric chemistry by Japan to promote funding support;
- Promote academic exchange on atmospheric research by Japan and internationally, especially with other IGBP-Japan or WCRP-Japan Committees; and
- Provide a platform in Japan to facilitate the academic growth and development of young researchers in atmospheric chemistry.

IGAC Monsoon Asia and Oceania Networking Group (MANGO)

Co-Chairs: Hiroshi Tanimoto, National Institute for Environmental Studies, Japan
Kim Oahn, Asian Institute of Technology, Thailand

In response to an increasing demand for environmental issues, atmospheric chemistry programs in Asia are rapidly growing. However, there is a large asymmetry between countries - some with their own national communities and some with only a handful, if any, atmospheric chemists. Hence we recognize the need to coordinate an atmospheric chemistry community at a regional level in Asia. The IGAC Monsoon Asia and Oceania networking group aims to establish robust cooperation between IGAC activities in Asia.

4. Opportunities for Training and Profession Development

Arguably IGAC's primary role is capacity building, exemplified every two years at its biennial Science Conference, which is the primary mechanism for IGAC to foster collaborations and disseminate scientific information across its international community. A key component of the biennial IGAC Science Conferences is the Young Scientists Program. The young scientists are deeply engaged in an international network of atmospheric scientists early in their career that will further facilitate atmospheric chemistry research and cooperation at an international level.

During the July 2014 – June 2015 IGAC IPO grant, IGAC held one biennial science conference.

- **22-26 September 2014, Changing Chemistry in a Changing World, Natal, Brazil**



The 13th Quadrennial iCACGP Symposium/13th IGAC Science Conference on Atmospheric Chemistry took place at the Natal Convention Center, with the theme *Changing Chemistry in a Changing World*. The conference had six sessions: (1) Atmosphere-surface interaction in a changing climate; (2) Atmospheric chemistry and the coupling between biogenic and anthropogenic emissions; (3) Interactions between aerosols, clouds and precipitation; (4) Atmospheric chemistry and urbanization: from local to global scales; (5) Atmospheric chemistry fundamentals; and (6) Atmospheric chemistry in a changing world. This was the first time IGBP or any of its core projects have held a science conference in South America. The conference had approximately 425 participants from 46 different countries, demonstrating the true breadth of the international IGAC community. The conference also had a strong Young Scientists Program that began with a short course on the topics of each session, career development talks, and a best oral and poster presentation competition (Figure 2). Approximately 70 young scientists received travel grants to attend the conference with funding coming from IGAC, WMO, ESA, ACCENT Plus, IGBP Brazilian Regional Office, and locally from the Brazilian government and universities.

In addition to its biennial Science Conference, IGAC also builds scientific capacity around the globe by financially sponsoring or endorsing workshops. Financial sponsorship of workshops is typically on the level of \$2-5K in the form of travel grants. Members of the IGAC community can also seek IGAC endorsement of a workshop that supports IGAC's mission and goals. The small amount of IGAC seed funding and/or endorsement of a workshop often acts as a catalyst for generating more funding from the nation or region where the workshop is taking place. Table 1 lists the workshops that IGAC financially sponsored during the July 2012 – June 2014 IGAC IPO Grant and Table 2 lists the workshops that IGAC endorsed during this time period.

Table 1. Workshops Sponsored by IGAC from July 2014 – June 2015

| Workshop Title | Location | Date |
|--|-------------------|------------------|
| IGAC Americas Working Group Meeting | La Paz, Bolivia | 20-22 Aug 2014 |
| AICI Chemical Atmosphere-Snow-Sea Ice Interactions Workshop | Cambridge, UK | 13-15 Oct 2014 |
| TOAR Workshop I | Boulder, CO, USA | 10-11 Dec 2014 |
| Future Directions of Arctic Air Pollution Workshop | Boulder, CO, USA | 3-5 Feb 2015 |
| IGAC Asia Working Group Workshop | Bangkok, Thailand | 2-3 March 2015 |
| TOAR Workshop II | Madrid, Spain | 27-30 April 2015 |
| 2 nd ACAM Workshop | Bangkok, Thailand | 8-10 Jun 2015 |
| ACAM Training School | Bangkok, Thailand | 11-12 June 2015 |
| IGAC-MANGO Workshop | Bangkok, Thailand | 11-12 June 2015 |
| The Future of Laboratory Studies in Atmospheric Chemistry Workshop | Boulder, CO, USA | 17-19 Jun 2015 |
| Nitrate Radicals and Biogenic VOCs Workshop | Atlanta, GA, USA | 22-24 Jun 2015 |

Table 2. Workshops Endorsed by IGAC from July 2012 – June 2015

| Workshop Title | Location | Date |
|--|--------------------|------------------|
| Climate Engineering Conference 2014 (CEC2014) | Berlin, Germany | 18-21 Aug 2014 |
| OH Reactivity Specialists Uniting Meeting | Mainz, Germany | 13-15 Oct 2014 |
| Atmospheric Chemical Mechanisms Conference | Davis, CA, USA | 10-12 Dec 2014 |
| Assessment of Local HO _x and RO _x Measurement Techniques | Juelich, Germany | 23-25 March 2015 |
| Southeast Atmosphere Studies Workshop | Princeton, NJ, USA | 8-10 June 2015 |
| Latin America and Caribbean Aerosol Measurement School | La Paz, Bolivia | 22-27 June 2015 |

5. IGAC Communications/Networking

The importance of science communication can clearly be seen in the increase in training courses and books on communicating science effectively. The IGAC IPO spends a significant amount of time on its communication strategy in order to better communicate IGAC activities to scientists, students, policy makers, stakeholders and the general public. IGAC's communication strategy currently includes:

- **IGAC Website** (<http://www.igacproject.org>)
The website highlights activities, conferences, workshops and IGAC related events. The website is kept up to date with recent publications, mailing announcements and upcoming events.
- **IGAC Mailing List**
Updates, reminders and information about conferences and activities are emailed to ~3,500 subscribers via MailChimp. IGAC also publishes a monthly eBulletin that informs the international atmospheric chemistry community about upcoming deadlines, events, job announcements, and community news related to IGAC and the wider global change and sustainability community.
- **IGACnews**
IGAC continues to produce a thrice yearly IGACnews that is distributed internationally to ~3,500 members of the IGAC community. IGACnews engages and informs the international community by providing information on IGAC activities through Editorials, Workshop Summaries, Activity Updates and Scientific Features. Each edition of IGACnews has a Young Scientist Spotlight that profiles an individual in graduate school or within 5 years of completing his/her doctorate. The Open Submission section allows non-IGAC activities related to atmospheric chemistry to publish Workshop Summaries, Activity Updates and Scientific Features. Archives of all IGACnews can be found on the IGAC Website.
- **Social Media**
IGAC is also found on social media outlets such as Facebook, Twitter and LinkedIn. IGAC will be exploring how to leverage social media to further advance international scientific collaborations in atmospheric chemistry research.
- **Visualizations**
IGAC continuously works with a graphic designer to create logos for its activities as well as communicate science more effectively through diagrams, figures and graphs.

- **Presentations**

The IGAC EO and members of the IGAC SSC give presentations on a regular basis on IGAC. Audiences for these presentations vary from government agencies, e.g. NOAA Climate Program Office, to international organizations, e.g. WMO.

6. Strategic Outlook

Allow this is the final report for this grant, IGAC will continue under new grants from June 2015 – July 2018. The progress of IGAC's current activities and National/Regional Working Groups is assessed at the annual IGAC Scientific Steering Committee (SSC). The 2015 IGAC SSC meeting will take place 28 September – 1 October 2015 in Potsdam, Germany. Based on the 2015 IGAC SSC meeting, some activities or working groups may be created, while others come to an end. IGAC will also continue to support workshops that are related to IGAC activities or its vision. IGAC will also continue to grow its communication/networking capabilities to meet the demand from our international community. Finally, as IGBP comes to an end December 2015, IGAC will be transitioning to becoming a core project of Future Earth. IGAC views Future Earth as a genuine opportunity for the international atmospheric chemistry community to enhance its connection between strong laboratory, field and modeling studies on emissions, atmospheric processes and atmospheric composition to the larger Earth system research community. Through Future Earth, IGAC can promote international collaborations and co-design the scientific knowledge required to respond effectively to the challenges and opportunities of global environmental change and sustainability.

Products

- **Publications**

1. [A global assessment of precipitation chemistry and deposition of sulfur, nitrogen, sea salt, base cations, organic acids, acidity and pH, and phosphorus](#) (2014) R. Vet, R.S. Artz, S. Carou, et al., *Atmospheric Environment*.

*This is a WMO sponsored assessment that includes observations and input from the IGAC Activity DEBITS.

2. [Arctic Air Pollution: New Insights from POLARCAT-IPY](#) (2014). K.S. Law, A. Stohl, et al., *Bulletin of the American Meteorology Society*.

- **Websites**

www.igacproject.org

- **Other Products**

IGACnews, <http://igacproject.org/IGACnews>

Participants

The International Global Atmospheric Chemistry (IGAC) Project's International Project Office (IPO) is located at the Cooperative Institute for Research in Environmental Sciences (CIRES) at the University of Colorado, Boulder. Two employees have been supported within the IGAC International Project Office from 2014 to 2015. Dr. Megan L. Melamed works 100% time as the IGAC Executive Officer. Jeff Jennings worked 20

hours per week as the IGAC Project Officer from July 2014-September 2014.

However, there is a much wider participation in the IGAC project than just those whose pay is covered under this grant. The project activities are guided and, in many cases, implemented by an international Scientific Steering Committee (SSC), which acts on a volunteer basis. The current IGAC SSC members as of January 2015 are listed in Table. 3.

Table 3. 2015 IGAC SSC

| Last Name | First Name | Institution | Country |
|------------------|-------------------|-----------------------------------|----------------|
| Goldstein | Allen (Co-chair) | University of California-Berkeley | USA |
| Lawrence | Mark (Co-chair) | IASS | Germany |
| Barth | Mary | NCAR | USA |
| Beukes | Paul | North-West University | South Africa |
| Crawford | James | NASA | USA |
| Granier | Claire | LATMOS | France |
| Grutter | Michel | UNAM | Mexico |
| Heald | Colette | MIT | USA |
| Hoelzemann | Judith | URFN | Brazil |
| Keywood | Melita | CSIRO | Australia |
| Kim Oahn | Nguyen Thi | Asian Institute of Technology | Thailand |
| Lewis | Alistar | University of York | UK |
| Lung | Candice | Academia Sinica | Taiwan |
| Pandis | Spyros | University of Patras | Greece |
| Rudich | Yinon | Weizmann Institute | Israel |
| Sharma | Chhemendra | National Physical Laboratory | India |
| Tanimoto | Hiroshi | NIES | Japan |
| Wang | Tao | Hong Kong Polytechnic University | China |
| Yassa | Nouredine | CDER | Algeria |

In addition to SSC members, IGAC relies on the involvement of the entire international atmospheric chemistry community in order to carry out its activities. This is both evident in the leaders of IGAC Activities and National/Regional Working Groups mentioned in this report as well as the scientists participating in the activities and working group and the attendees IGAC sponsored and endorsed workshops and conferences.

Impacts

The role of the IGAC Project is twofold. Its first responsibility is to coordinate and foster atmospheric chemistry research at an international level. Although IGAC does not conduct research, it does provide an “added value” to atmospheric chemistry research. Examples of this are facilitation of international collaboration for research field campaigns, which means that scientists funded at the national level gain access to resources, knowledge, and coordination thus getting more “bang for their buck” from

their research grants, e.g. POLARCAT. IGAC also organizes international efforts to address research needs in specific regions of the world, e.g. IGAC National/Regional Working Groups, or on specific topics in atmospheric chemistry, e.g. the IGAC/SOLAS OASIS Activity. In addition, IGAC coordinates the synthesis, assessment, and summary of research that would otherwise not occur, e.g. The Tropospheric Ozone Assessment Report (TAOR). IGAC, through the Chemistry-Climate Model Initiative (CCMI) is contributing to the WMO/UNEP Ozone Report and the IPCC assessment process. IGAC also has a strong focus on engaging the next generation of young atmospheric scientists by providing travel grants to IGAC cosponsored workshops, meetings, and conferences as well as highlighting their work in IGACNews. Therefore, from early in their careers, these early career scientists join an international network of atmospheric scientists that will further facilitate atmospheric chemistry research at an international level.

IGAC's second responsibility is to act as a liaison between the atmospheric chemistry community and the broader Earth System Research community. As part of the IGBP, IGAC contributes to understanding the current state of knowledge of the Earth System and identifying the most pressing issues in the Earth System. IGAC facilitates integrative research and synthesis efforts that leverage atmospheric chemistry research to address larger Earth System questions, e.g. Global Emissions Initiative (GEIA). In addition, IGAC publishes reports such as the *Strategic Framework on Integrated Programs on Air Pollution and Climate Change* that reach a wider audience and different disciplines than individual papers published in atmospheric chemistry journals. IGAC also works to reach across the aisle into different disciplines in order to bridge the divide between scientific experts. Through its activities, IGAC provides an invaluable service to the international atmospheric chemistry community, the wider Earth System Research community, and to stakeholders both by advancing atmospheric chemistry research and contributing to understanding the Earth System.