A satellite view of Earth from space, showing the Americas and the Atlantic Ocean. The landmasses are green and brown, while the oceans are various shades of blue. The Earth's curvature is visible on the right side.

# The Inter-American Network of Academies of Sciences



**iap**

the global network of science academies

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# Foreword

Networks are powerful instruments for sharing and rapidly disseminating information, best practices and novel ideas through a larger community. By virtue of their credibility and independence from government, Academies have clear advantages in addressing issues related to science, technology and health and in advancing high quality science education at the national level.

IANAS, the Inter-American Network of Academies of Sciences was created to support hemispheric cooperation by strengthening science and technology as tools for advancing evidence based knowledge, prosperity and equity in the Americas.

Our Mission is to strengthen science communities and to provide an independent source of policy advice to governments on key scientific, technological and health challenges. IANAS views strong science academies and vibrant science and technology communities as essential to sustainable development in the Americas.



# Women for Science Program

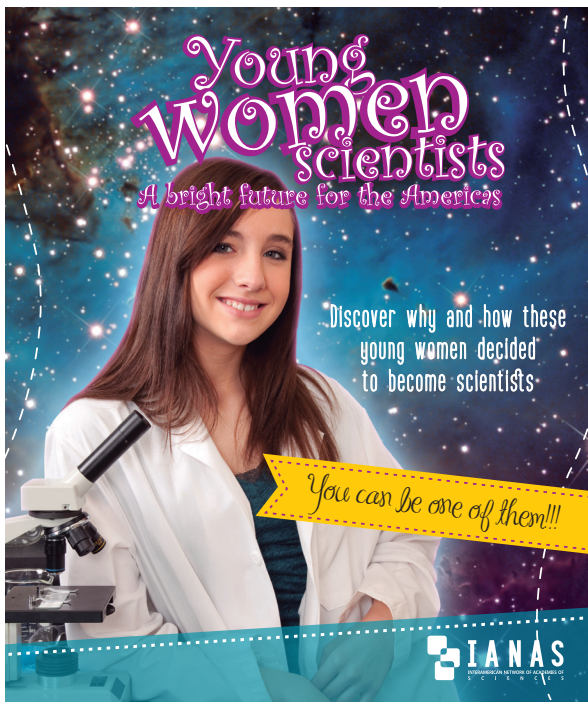
Enhancing the status  
of women scientists

*The IANAS WfS advises the IANAS academies on fostering a climate that is welcoming to women. It develops actions that increase the visibility of the contributions of women scientists and engineers.*

The IANAS Women for Science working group (WfS) was launched in Rio de Janeiro in 2010. Subsequent meeting in Mexico City (2011), Panama (2012), Chile (2013), Ottawa (2014) and Santa Cruz Bolivia (2015) established goals, identified the program leadership and carried out an ambitious program of actions.

### Vision

The long term vision of the WfS working group is to move towards the full inclusion and empowerment of women in science and technology from top decision-making levels in government and in private industry and down to the grass roots community level.



*Young Women Scientists. A Bright Future for the Americas*  
2015



2015 “Anneke Levelt Sengers” Prize The winner was

### Mission

WfS works towards the full engagement of women in science, technology, and development by advising the IANAS member Academies on gender issues, by telling the stories of outstanding women scientists and by recognizing exceptional achievement in science.

### Summary of Achievements

Two major achievements have been the bilingual books of 36 biographical sketches of eminent women scientists *Women Scientists in the Americas. Their Inspiring Stories* and the publication *Young Women Scientist. A bright future for the Americas*. The books are available in print and on the IANAS website [www.ianas.org](http://www.ianas.org)

A second crucial accomplishment is the two rounds of the IANAS WfS Prize; the first Prize was in 2012 and it was awarded to a PhD chemistry student Clarimar Camacho from Venezuela. The second the Prize was awarded in 2015-2016 to a Cuban scientist Lianet Monzote with PhD in Pharmaceutical Sciences.



Book “Women Scientists in the Americas. Their Inspiring Stories” March, 2013

A third major achievement was the 2015 report *Survey of Women in the Academies of the Americas*. This comprehensive report provides the first data based survey of the representation of women in the Academies of the Americas. The IANAS report was later incorporated into a second global report entitled “Women for Science Inclusion and Participation in Academies of Sciences” published by IAP and presented during the General Assembly in South Africa. Both reports reveal that there is still a great deal of work to do in the Academies of Sciences to increase and enhance the status of women members.



2012 Panama

**Future Actions for 2016-2019**

- The Program will encourage the establishment national working groups to advance women scientists, engineers and medical doctors.
- The Program will encourage the Academies to create strategies to give more visibility to women scientists using instruments like biographies, interviews and special sections on the websites.
- The Program will explore the creation of a mentoring programs for young women who aspire to be scientists.

*Women for Sciences Focal Points meeting. Mexico 2011*



2013 Focal Points Meeting Chile





# Energy Program

Sustainable Energy  
in the Americas

*The Americas possess abundant sources of energy including, fossil energy and renewable energy. The challenge is to increase efficiency, to reduce emissions, and to bring energy to traditionally under served communities.*

A sustainable energy future for the Americas will depend on how we select from the mix of energy resources, transform these sources into useable forms, transport the energy to end users, and improve the efficiency of end uses. The result will determine the social, environmental and economic future for generations of Americans.

### Achievements

The IANAS Energy Program grew out of the 2007 InterAcademy Council's report, *Lighting the way; Toward a sustainable energy future*. The program



*The Energy Program visiting a solar plant at the Mojave Desert. California 2013*



*Book Guide Towards a Sustainable Energy Future for the Americas, 2016*

identified the report's highest priorities for the Americas, shared information on these priorities among academies and scientific organizations and outside experts in annual workshops, drafted action plans in these priority areas and began the initiation of these plans.

The program finished the book *Guide Towards a Sustainable Energy Future for the Americas* to provide a science-based analysis of the current energy situation of the Americas and to advance the near-term future of energy in the Hemisphere. The book describes the essential actions required to build the institutional capabilities necessary to achieve sustainable energy in the Americas, focusing on the critical role of science in a future that incorporates social, environmental and economic values.



*2013-2014 US Hosted by the US-national Academy of Sciences, the program met to decide and work on the structure of the sustainable energy for the Americas*

*The Energy Program worked with ICSU ROLAC on a joint energy publication. Several IANAS focal points participated with the ICSU Energy Publication.*

The chapters of the book were written by experts from across the hemisphere and address the key issues facing the Americas.

Chapter 1: Energy Efficiency in the Americas.

Chapter 2: Energy for Underserved Populations: Meeting the basic needs of the poorest people in Latin America and the Caribbean

Chapter 3: Renewable Energy: Immense Opportunities for Renewable Energy in its Many Forms

Chapter 4: Women, Energy and Water: The Effects of Gender and Culture on the Roles and Responsibilities of Women

Chapter 5: Understanding Bioenergy

Chapter 6: Current status and perspectives for bioenergy in Latin America & Caribbean: addressing sugarcane ethanol.



*The Energy Program visiting a solar plant at the Mojave Desert. California 2013*

### Activities for 2016-2019

Collaborate with the “Smart Villages” project and explore the challenging intersection between water and energy in collaboration with the IANAS Water Program.



# Science Education Program

Science Academies  
enhancing science  
education in the  
Americas

*The IANAS Science Education Program (IANAS SEP) comprises 21 Academies of Sciences in the Americas. The goal is to develop actions and programs that enhance science education in the Americas*

The various National Academies of Science in the Americas work within their local and national context to develop Inquiry Based Science Education (IBSE) programs. These programs are aimed at training primary, middle school and high school teachers to enhance science literacy. Working through IANAS, the academies share experiences and best practices and rapidly disseminate effective practices and experiences among countries.

With different names and scope of work like “Doing Science at School” in Argentina; “Science goes to your School” in Bolivia; “ABC na Educação Científica” in Brazil; “Small Scientists” in Colombia; IBSE in Chile; “Science at School” in Mexico; ECBI in Peru, the Academies share a single goal: to provide teachers and students the wonderful experience of discovery in science and technology using the Inquiry Based Science Education methodology.



*Maydianne Andrade and a graduate student in Canada.*

### **First, Professional Development or “Training the trainers”**

Academies work to raise the level of teacher’s knowledge in science. The most effective means to reach students is through their teachers. The academies engage professional scientists from all disciplines in enhancing the training of teachers.

Since the inception of the Program, Workshops on IBSE have been conducted in most of the countries of the Americas. As a result of those activities thousands of teachers in the region have been benefited with these training courses.

### **Workshops**

An essential feature of the Network is the sharing of experience, knowledge and resources between the countries. More than one hundred teacher training workshops have been held in Latin American countries using the IBSE methodology.

### **Materials-Resources Development**

Approaches used in the adoption and/or development of teaching materials vary by country. Initially there was a heavy reliance on materials from *La main a la pate* developed in France or on materials developed by the Smithsonian National Science Resource Center. In some cases, a hybrid IBSE model based national curricular mandates has been developed by individual national academies. The fact is that Academies have the knowledge but they not always have the human or financial resources to create materials.

### **Subsequent achievement: secondary level science education**

The “Transition from IBSE to high school” in Chile has a demonstrated record of stimulating the interest of young students in science where IBSE has contributed to the development of critical thinking skills. Workshops for secondary level science teachers have been implemented with emphasis in Molecular Biology and Genomics (Chile); Mathematics (Peru); Green Chemistry (Argentina); Evolution, Health and Nutrition (Bolivia).



2011, IANAS and INDAGALA Meeting hosted by the Mexican Academy of Sciences

The Mexican Academy of Sciences has successfully implemented distance education courses, mainly offered to teachers of Central America, the Caribbean and other countries. The teachers obtain a *Diploma* after successfully completing all the courses.

### IndagaLA

In 2009 the web portal IndagaLA was launched by the Colombian Academy to collect materials and make them available to all countries. In 2012 the Portal “IndagaLA” sponsored by the Mexican Academy of Sciences was expanded and renewed and in 2013 a new and improved version was Implemented. The future of the portal is threatened by funding challenges.

### Strengths and Opportunities for the SEP Program

The SEP Program has a consolidated network of Focal Point with, in some cases, with more than 30 years working and promoting science education in their countries.

Because different countries have different needs, there is not a single way or methodology to work actions or programs to promote Science Education. Each Academy will need to work with different groups to define the scope and nature of the work in their countries.

Academies of Sciences often lack the funds and staff to implement a Science Education Program but they can create small workshops to train teachers; establish national contests or fairs designed to recognize the efforts of principals, teacher and students promoting science education. Academies can create regional efforts or disseminate materials produced by other international organizations on subjects related with science education.

### General actions proposed for 2016-2019

- The IANAS SEP Program will publish a report on the lessons learned by the Academies in advancing science education in the Americas in early 2017.
- The Program Focal Points will meet in the Dominican Republic to renew the strategic plan for 2016-2019.





# Water Program

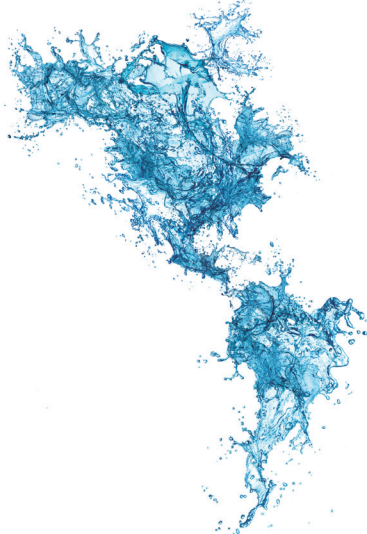
Enhancing  
access to water  
and sanitation in  
the Americas

*Access to clean water is one of the major problems faced by humanity at the beginning of the 21st Century. This problem is exacerbated by a long history of pollution and inefficient use of this critical natural resource. Moreover, demand will increase as populations grow. To cope with this problem, the Science Academies of the Americas decided to establish a water program to aid national governments and the public in addressing this critical challenge.*

The Academies of Sciences appointed scientists and experts as Focal Points on water in 2010. Their task was to formulate a strategic view on water resources, to prepare assessments of water resources in the Americas, to identify the main water resource challenges facing the hemisphere and to develop strategies to improve the quality and management of water in the Americas.

## URBAN WATER CHALLENGES IN THE AMERICAS

*A perspective from the Academies of Sciences*



*Urban Water  
Challenges in the  
Americas.  
A perspective from  
the Academies of  
Sciences, 2015*

### Accomplishments of the Water Program: Books

More than 100 experts collaborated to produce the book *Water Diagnosis in the Americas* in 2012. In 2015, with the support of UNESCO-Hydrological International Program, the book *Urban Water Challenges in the Americas: A Perspective from the Academies of Sciences* was published.

### Training Courses

The national focal points of the IANAS Water Program, helped mount training courses for high-level water managers in several countries and regions of the Americas 2013 and 2014. More than 500 professionals from all over the Americas contributed to the training courses. More courses will be implemented for 2016-2019.

### International cooperation

Water Program Focal Points have participated in important international events such as the 7th, 8th and 9th Rosenberg International Fora on Water Policy, “Water for the Americas: Challenges and Opportunities” in Argentina in 2010, “Managing Water in the 21st Century: Challenges & Opportunities” in Jordan in 2014 and “Managing Water and Biodiversity in Humid Areas” in Panama in 2016. IANAS Water Focal Points have been invited to participate in the design for the Institute of Water Sciences in Peru.

The IANAS Water Program organized two meetings in collaboration with the Network of African Science Academies (NASAC), the international symposium “Bridging Science and Policy to Enhance Water Security in Africa and the Americas” at the City of Knowledge, Panama and “Improving the Management of Water Resources for Sustainable Development in Africa and the Americas” in Nairobi, Kenya.

### Focal Point meetings

Thanks to the support of the IANAS Academies of Sciences and IAP, the Program has had very productive annual meetings and workshops in Argentina (Nov 2010), Bolivia (Nov 2011), Guatemala (Nov 2012), Peru (2013), Panama (2014), and the US (2015).

## Symposia

IANAS co-sponsored the international symposium “Enhancing Water Management Capacity in a Changing World: Science Academies Working Together to Increase Global Access to Water and Sanitation”, held in Brazil in 2012.

## UN Organizations

IANAS and UNESCO-International Hydrological Program cooperated in the organization and execution of the IANAS-UNESCO-IHP Workshop: “Water Quality in the Americas”. The workshop, hosted by the US National Academy of Sciences, was dedicated to one of the most important issues in water resource management, assuring water quality. A valuable collection of the water quality lectures were recorded and are available on the IANAS web page.

## Main Achievements of the Program

- The results of our work are being used as a reference by agencies, experts and by the public.
- The Water Program network has been able to grow with the addition of more experts.
- The Academies are more frequently called on to collaborate with policy makers and decision makers on big issues related to water security for the XXI Century.

## Goals for 2016-2019

- An Executive Summary for policy makers and media of the book “Urban Water Challenges in the Americas: A perspective from the Academies of Sciences”
- The production of a book, focusing on Water Quality in the Americas together with UNESCO IHP.
- Regional workshops on different water management topics such as Eutrophication of Surface Waters, Management of Water and Energy and Water Resources and Climate Change.
- An increased emphasis on reaching the media and policy makers with clear messages on key water challenges



*As part of the activities discussing “Water Quality for the Americas” sponsored by UNESCO-IHP, the IANAS Water Program at the GWRS world’s largest purification system for potable use. California, 2015*



*2014 Panama Hosted by APANAC, the IANAS and NASAC water focal points met to discuss “Science for Urban Water Security”. Panama*

- Continue to reinforce the cooperation with the Network of African Science Academies.

The IANAS Water Program will stimulate the National Water Committees in involvement in publications and workshops.



# Capacity Building

Strengthening  
Science Academies  
in the Americas

## IANAS Accomplishments. An overview through the years

### The Big Achievements 2010-2016

The goal of IANAS is to strengthen the Academies of the Americas as valuable societal institutions. In the past six years the Academies of the Americas have pursued this goal by working together on natural and human resource challenges. This collaborative work has promoted the exchange and sharing data, information, and institutional experiences.

**The work of IANAS depends on Focal Points** appointed by and representing each Academy. The Focal Points are scientists and experts who work pro-bono to address common goals and complex regional problems. We are indebted to the many individuals who have given their time and knowledge to make IANAS a success.

**This brochure lists and describes some of the highlights of the IANAS programs from for the period 2010-2016.**

**Some statistics:** 64 Scientific international activities in 10 years, Approximately 1390 scientists and experts have contributed to the various projects organized by IANAS, 23 Academies of Sciences in the Americas and a number of International organizations supported IANAS activities, Nine books in English and Spanish that has been downloaded 2,821,347 times from our website. A website has been visited by 14,340,792 people.

*2014 IANAS organized a symposium entitled “New Horizons in Science” for young to mid-career scientists from Canada, Mexico and the United States.*



## 2010

- The National Academy of Sciences of Bolivia hosted the Eighth Meeting of the IANAS Executive Committee in La Paz, on February 25th and 26th.
- IANAS and the Brazilian Academy of Sciences, hosted the VII Meeting of the Science Education Program in Rio de Janeiro, on June 12-14 2010.
- Brasilia July 2010 the Brazilian Academy of Sciences hosted the workshop “Inventing a Better Future Workshop: A Strategy for Building Regional Capacities in Science and Technology”.
- Ottawa IANAS General Assembly: The Royal Society of Canada hosted a Conference and General Assembly in Ottawa, Canada, on August 26-28, 2010. Michael Clegg (US) and Juan Pedro Laclette (Mexico) were elected Co-Chairs of IANAS for 2010-2013.
- The participation of IANAS on the Seventh Biennial Rosenberg International Forum on Water Policy, Buenos Aires, Argentina November.
- The initial meeting of the IANAS Energy Project on Dec. 6-7, 2010, in Bogota, Colombia. Adopted a program of multi-country efforts to strengthen energy sustainability of the Americas.

## 2011

- First Women for Science Focal Points Meeting Mexico City, February 24-27, 2011
- On May 2011, celebration of the 150th Anniversary of the Cuban Academy of Sciences, and Executive Committee meeting in La Habana, Cuba.
- Science Education Focal Point meeting Hosted by Colombian Academy of Exact, Physical and Natural Sciences.
- Towards a Sustainable Energy Future in the Americas: Implementing of the recommendations of the IANAS Workshop. Colombia June 2011
- National Workshop of Integrated Water Management for Neo tropical Basins and October Colombia.



*Every year the Executive Members meet to assess the progress of the Programs. Hosted by the US-National Academy of Sciences the EC Members. Washington, 2014*

- The NAS-IANAS Fellowships for Short Scientific Visits in October 2011. 28 young scientists from the Americas received.
  - The IANAS SEP Focal Points: INDAGALA meetings in July 2011 in Mexico and a strategic planning workshop in Buenos Aires, November 2011.
  - 6th Meeting of the National Focal Points of the IANAS Water Program, November 22-23, 2011, Lago Titicaca, Bolivia.
  - “Bridging the Gap Between Scientists and Journalists” workshop Hosted by the National Academy of Exact Physical and Natural Sciences of Argentina November 28-30, 2011.
  - Second IANAS Energy Program: April 16-19, 2012, at Lake Titikaka hosted by the Academy of Sciences of Bolivia. Agreed on the priorities to be addressed by the Program.
  - Regional Workshop on Non-Communicable Diseases 3-5 May, 2012 Rio de Janeiro. Organized by Brazilian Academy of Sciences (ABC), the National Academy of Medicine (ANM), Latin American Association of Academies of Medicine (ALANAM), InterAcademy Medical Panel (IAMP) and the InterAmerican Network of Academies of Sciences (IANAS).
  - Enhancing Water Management Capacity in a Changing World: Science Academies Working Together to Increase Global Access to Water and Sanitation. Sao Paulo, Brazil June 25-28, 2012.
  - Hosted by the Colombian Academy of Exact, Physical and Natural Sciences the IX Focal Points Meeting of the Science Education IANAS Program in Bogota, Colombia 9 and 10 August, 2012
  - Hosted by Academy of Physical, Mathematical and Natural Sciences of Venezuela; An IANAS
- 2012**
- The IANAS EC Meeting took place at the Chilean Academy of Sciences on January 9th and 10th, 2011 to review and discuss the structure of the IANAS Strategic Plan.
  - Regional Water Workshop in Managua, Nicaragua, January 30th to February 2012
  - Second Women for Science Focal Points Meeting Panama, February 9-11, 2012. Supported by APANAC.





*IANAS supported the creation of different Academies of Sciences in the region. Here, Michael Clegg IANAS CO-Chair and Carlos Soria, President of the Academy of Sciences of Ecuador, signing the first certificates for the new inducted members in Ecuador*

EC Meeting July 30 to August 2, 2012. The IANAS Women for Science Prize was awarded to a young woman scientist from Venezuela at the meeting.

### 2013

- IANAS held a General Assembly and General Conference meeting in Punta Cana, Dominican Republic in July 2013. The Punta Cana General meeting elected new Academies from Ecuador, Honduras, Uruguay and one Scientific Association APANAC (Panama) to membership. The Academy of Cordoba was accorded observer status.
- Climate Change booklet published in Spanish by The US-National Academy of Sciences and IANAS.
- A major 2013 output from the Women for Science program was a book of short biographies of outstanding women scientists

entitled *Women Scientists in the Americas: Their Inspiring Stories*. The WfS Focal points met in Chile to plan a survey of women scientists in Academies.

- The Women for Science publication was mentioned in NBC-America and the Future Young Leader's initiative in India
- The Science Education Program (SEP) organized a meeting of Focal Points in Chile in 2013 to share best practices among countries in implementing novel science literacy programs.
- The IANAS Energy Program organized a Focal Point meeting at the
- Beckman Center of the National Academy of Sciences in September 2013 to work on a book on sustainable energy in the Americas
- The IANAS Water Program organized training courses for more than 500 high-level water managers from all over the Americas. A meeting of the Focal Points of the Water Program was held in Lima, Peru in December 2013 where the initial steps towards production of a second book on *Urban Water Challenges in the Americas* were taken.

### 2014

- The EC Committee met at the US National Academy of Sciences, Washington in March 2014. IANAS also invited two non-EC Academies to attend EC meetings as observers; in this case Panama and Uruguay were invited as observers.
- The Energy Program worked with ICSU ROLAC on a joint energy publication. Several IANAS focal points participated in the ICSU Energy Publication.
- IANAS organized a symposium entitled "New Horizons in Science" for young to mid-career scientists from Canada, Mexico and the United States. The sessions featured current advances in astrophysics, biotechnology, green chemistry, marine science and the science of hazards and disasters. The goal was to build broader relationships among future science leaders and to foster science cooperation between the countries of North America.

Supported by the Mexican Academy of Sciences and the US NAS.

- The Water Program organized a Focal Points Meeting in Panama in October 2014 and held the first of two Workshops with the Network of African Academies (NASAC). The President of Panama attended the main Symposium where IANAS received a special mention.
- Organization of two regional workshops for quality water. Meeting results are available at: <http://www.ianas.org/index.php/programs/water/87-programs/water/476-activities-2014>
- The Women for Science Program held a planning meeting in Ottawa, September 2014. The WfS group prepared a survey report on the status of Women Scientists in the Academies and the report was circulated to the Academies.
- A chapter about Energy, Water and Gender was initiated with the cooperation of Focal Points from the Energy, Water and Women for Science Programs
- The Science Education Focal Points met in September in Lima Peru to discuss the future steps of the Program.
- IANAS helped support an international Workshop to Identify Major Scientific and Technical Questions that should be investigated in association with the construction of a Transoceanic Canal Through Nicaragua. Workshop held in Managua November 2014.

## 2015

- The launching of the Academy of Sciences of Ecuador (ACE) with the induction of the first class of elected members in Quito in February 2 2015. IANAS is currently working with scientists in El Salvador on the possibility of establishing an Academy of Sciences.
- Release of the book *Urban Water Challenges in the Americas: A view from the Academies of Sciences* in March 2015. The publication has been presented at public events in various countries and is available at most of the Academies of Sciences <http://www.ianas.org/index.php/books>



*2011 Argentina  
“Challenge and Opportunities in Communicating Science to the Public” Hosted by the National Academy of Exact Physical and Natural Sciences of Argentina November 28-30, 2011.*

- The IANAS Executive Committee met in May 2015 in Bogota Columbia to plan the activities of IANAS for 2015-16.
- The workshop held in Managua in November 2014 on the “Scientific Questions Associated with the Proposed Trans Oceanic Canal through Nicaragua” helped to stimulate several publications in 2015 in the scientific and popular literature on the issues surrounding the canal project.
- Image: Cover on Nature magazine, one of the “after IANAS-workshop” publication derived from the meeting.
- The inclusion of IANAS in a major project on *Food and Nutrition Security* that will be a significant focus over the next two years. This project was planned at a meeting at the Leopoldina in Halle, Germany in June 2015 and is funded by the German Government

- With the support of the National Academy of Sciences, On September, a joint IANAS-UNESCO–NAS workshop on water quality was held in Irvine CA to initiate work on a major book on the subject of water quality in the Americas.
- The complete set of presentations has been uploaded in Youtube: [https://www.youtube.com/channel/UCj8C\\_cCdLlvwJALrVKtYC1g](https://www.youtube.com/channel/UCj8C_cCdLlvwJALrVKtYC1g)
- Graduate and Undergraduate from UCI-Ayala Biological Science School studying bacteria in water, attended during the presentations and this activity was noted as one of the key c.
- Successful Women for Science Meeting in Santa Cruz, Bolivia.
- A Prize for young women scientists honoring our inspiring WfS leader “Anneke Levelt Sengers”
- Two very successful joint workshops on water with the Network of African Academies of Science (NASAC), one in Panama in 2014 and one in Nairobi, Kenya in November 2015. <http://www.ianas.org/index.php/programs/water/87-programs/water/516-activities-2015>
- A wonderful publication of short biographies on young to mid career women scientists in the Americas in both English and Spanish was completed in December 2015 entitled *Young women scientists: a bright future for the Americas* and will be released on International Women’s Day in 2016.
- Successful workshops on science education held in Santiago, Chile and Mexico City in 2015.
- The completion of the book on *Guide Toward a Sustainable Energy Future for the Americas* released during the General Assembly in Rio de Janeiro 2016.

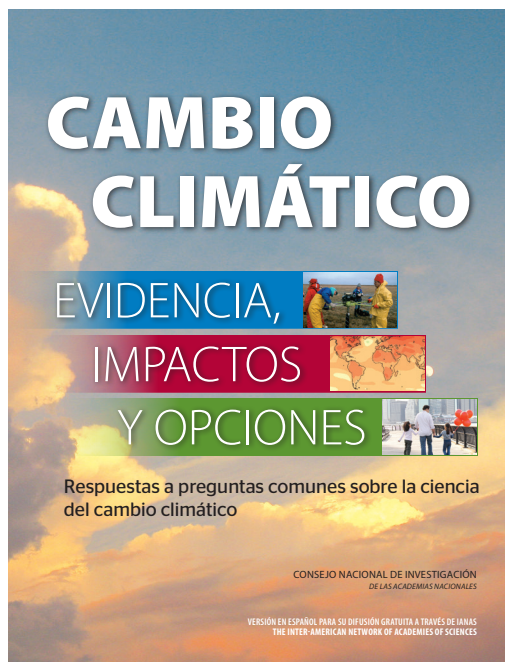
## 2016

- Meeting of the IANAS Executive Committee, Merida City, Mexico Hosted by the Mexican Academy of Sciences, February 2015.
- The second planning meeting for Food and Nutrition Security project that will be sponsored by the Leopoldina in Halle, Germany and funded by the German Government. Hermanus, South Africa
- Hosted by the Brazilian Academy of Sciences, the IANAS General Assembly will take place in Rio de Janeiro, May 2016. The Brazilian Academy founded in 1916 will be celebrating their 100th Anniversary of public service to Brazil.

## IANAS Publication

The goal of IANAS is to bring evidence based science policy and to build scientific capacity building in our hemisphere. IANAS achieves this goal by advancing investment in human resources for science and by focusing on key resources challenges. IANAS free public access publications are privileged to have the best minds in the region to writing these books that are becoming valuable reference for policy makers, public and private agencies and as reference for the public.

- Spanish edition of the report *Climate Change. Evidence, Impacts and Choices National Research Council of the National Academy of Sciences*, 2012. [http://www.ianas.org/books/CAMBIO\\_CLIMATICO\\_WEB.pdf](http://www.ianas.org/books/CAMBIO_CLIMATICO_WEB.pdf)



Spanish edition of the report *Climate Change. Evidence, Impacts and Choices National Research Council of the National Academy of Sciences*, 2012

- *Diagnostico del Agua en las Americas*. IANAS-Foro Consultivo Cientifico y Tecnologico, AC, 2013. [http://www.ianas.org/water/book/Diagnosis\\_of\\_Water\\_in\\_the\\_Americas.pdf](http://www.ianas.org/water/book/Diagnosis_of_Water_in_the_Americas.pdf)
- *Women Scientists in the Americas: Their Inspiring Stories*. IANAS-IAP Bilingual Publication [http://www.ianas.org/books/WOMEN\\_SCIENTISTS\\_IN\\_THE\\_AMERICAS\\_low\\_res.pdf](http://www.ianas.org/books/WOMEN_SCIENTISTS_IN_THE_AMERICAS_low_res.pdf)
- *Diagnosis of Water in the Americas*. IANAS-Mexican Academy of Sciences, 2013. [http://www.ianas.org/water/book/diagnostico\\_del\\_agua\\_en\\_las\\_americanas.pdf](http://www.ianas.org/water/book/diagnostico_del_agua_en_las_americanas.pdf)
- *Summary of Discussions during the International Workshop to Identify Major Scientific and Technical Issues Associated with the Interocceanic Canal through Nicaragua*, 2014. <http://www.ianas.org/index.php/programs/capacity-building?id=507>
- *Report on Non-Communicable Diseases* Academy of Sciences of Brazil, IAMP, IANAS, 2014. <http://www.ianas.org/index.php/books>
- *Conclusions on Bridging Science and Policy to Enhance Water Security in Africa and the Americas* IANAS-NASAC UNESCO, 2104 <http://www.ianas.org/index.php/programs/water?id=2104>
- *Urban Water Challenges in the Americas: A perspective from the Academies of Sciences*. IANAS-UNESCO International Hydrologic Program- IAP, 2015. [http://www.ianas.org/books/books\\_2015/water/agua\\_urbana\\_210315.pdf](http://www.ianas.org/books/books_2015/water/agua_urbana_210315.pdf)
- *Environmental Science & Technology* (Huete et al., 2015), <http://pubs.acs.org/doi/abs/10.1021/acs.est.5b00215>
- *Urban Waters Challenges in the Americas: A perspective from the Academies of Sciences*. IANAS-IAP-UNESCO-IHP, 2015. Spanish and English: [http://www.ianas.org/books/books\\_2015/water/urban\\_water\\_210315.pdf](http://www.ianas.org/books/books_2015/water/urban_water_210315.pdf)
- *Guide Toward a Sustainable Future for the Americas*. IANAS-Energy Program-IAP, 2015-2016. Spanish and English, <http://www.ianas.org/index.php/books>
- *Young Women Scientists: A bright future for the Americas*. IANAS-IAP. Spanish and English [http://www.ianas.org/women\\_2015/young\\_women\\_scientists/book-young-women-scientists.pdf](http://www.ianas.org/women_2015/young_women_scientists/book-young-women-scientists.pdf)
- *Survey of Women in the Academies of the Americas*. IANAS-IAP, 2015. Electronic Version Only. [http://www.ianas.org/books/books\\_2015/women/survey-of-women.pdf](http://www.ianas.org/books/books_2015/women/survey-of-women.pdf)
- Clegg, M. T., J. A. Asenjo and A. de la Cruz. 2015. *The Inter American Network of Academies of Science: An example of Science-Based cooperation in the Americas*. AAAS Science & Diplomacy. 03.30.2015. Electronic version only: [http://www.sciencediplomacy.org/files/the\\_interamerican\\_network\\_of\\_academies\\_of\\_sciences\\_science\\_\\_diplomacy\\_2.pdf](http://www.sciencediplomacy.org/files/the_interamerican_network_of_academies_of_sciences_science__diplomacy_2.pdf)

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We are the Academies of Sciences of the Americas.  
We are Scientists, Doctors, Engineers, and experts of different disciplines working together addressing challenges on Water, Energy, Food Security, Science, Education and Gender Equity for the Americas.  
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February 2016 - October, Mexico, Mexico  
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 ▶ IANAS General Assembly  
 November 2016  
 ▶ IANAS Energy and Water Meeting

**IANAS is the Inter-American Network of Academies of Science.**

Networks are powerful instruments for sharing and rapidly disseminating information, best practices and novel ideas through a larger community. By virtue of their credibility and independence from government, academies have certain inherent advantages in addressing issues related to science, technology and health (STH) and in advancing high quality science education at the national level.

Our Mission: to strengthen science communities in the hemisphere and to provide an independent source of policy advice to governments on key scientific, technological and health challenges.

Our Vision: IANAS views strong science academies and vibrant science and technology communities as essential to sustainable development in the Americas.  
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