

## REPORT

### 1. Activities conducted between November 2018 - March 2021

#### 1.1 Members of the IHP National Committee

Considering the National Committee plays a key role in the IHP execution as a liaison between the programme and agencies, business organisations, mass organisations, associations, civil population and the UNESCO National Commission, the National Committee and its board of directors were reinstated in December 2018. This reinstatement reflects the Committee's interest in strengthening its multidisciplinary structure, maintaining the systematic nature of the Committee's work by covering different provinces, and complying with the agreements entered into. For such purposes, the board and its members have been structured as follows:

Chairperson	Carlos Alberto Luaces Socarrás MSc. Eng. Head of the Secretariat of the National Basin Council ( <i>CNCH</i> ) of the National Institute of Water Resources ( <i>INRH</i> ) and Secretary of the <i>CNCH</i> .	<a href="mailto:carlos.socarras@hidro.gob.cu">carlos.socarras@hidro.gob.cu</a>
Vice-chair	Dr Eduardo Planos Gutiérrez. Researcher at the Institute of Meteorology and Professor at the University of Havana.	<a href="mailto:eduardo.planos@insmet.cu">eduardo.planos@insmet.cu</a>
Vice-chair	Dr Yaset Martínez Valdés. Professor at the Technological University of Havana "José Antonio Echeverría" and Researcher at the Hydraulic Research Centre.	<a href="mailto:yaset@cih.cujae.edu.cu">yaset@cih.cujae.edu.cu</a>
Secretary (since 2019)	Ms Carmen Maury Toledo. Specialist of Exact & Natural Sciences, Cuban National Commission for UNESCO ( <i>CNCU</i> )	<a href="mailto:cmaury@cncu.minrex.gob.cu">cmaury@cncu.minrex.gob.cu</a>

### 1.1.1 List of members

No.	Full name	Organisation	Position
5	Leslie Llanes Santamaría, <b>Engineer</b>	National Institute of Water Resources <i>INRH</i>	Director of Water Quality and Pollution Control.
6	Evelyn Garrigas Arias, <b>M. Sc.</b>	National Institute of Water Resources <i>INRH</i>	Official
7	<b>Dr</b> José Evelio Gutierrez	MES-UH	Professor at School of Geography - <i>UH</i>
8	Argelio Fernández Richelme, <b>M. Sc.</b>	National Institute of Water Resources <i>INRH</i>	Primary Specialist on Hydrological Service
9	<b>Dr</b> Cristóbal Díaz Morejón	<i>DMA- CITMA</i>	Official
10	Rafael Feitoo, <b>Engineer</b>	Society of Hydraulic Engineering Cuba - <i>UNAICC</i>	Chairperson
11	<b>Dr</b> Braulio P. Lapinel Pedroso	Institute of Meteorology - <i>CITMA</i>	Researcher
12	<b>Dr</b> María Elena Ruíz Pérez	Agrarian University - Habana <i>UNAH</i>	Head of Agrophysical Research Group
13	<b>Dr</b> Orestes Valdés	Ministry of Education <i>MINED</i>	Environmental Education Advisor
14	<b>Dr</b> Teresa López Seijas	Agricultural Engineering Research Institute IAgric <i>MINAG</i>	Scientific Director
15	Orlando Laíz Averhoff, <b>M. SC.</b>	<i>OSDE GIAT</i>	Specialist
16	<b>Dr</b> Yakelin Rodríguez López	Hydraulic Research Centre.	Professor at <i>CIH - CUJAE</i>
17	<b>Dr</b> Julián Herrera Puebla	IAgric <i>MINAG</i>	Specialist
18	María Teresa Durán, <b>M. Sc.</b>	<i>DPRH</i> Santiago de Cuba, <i>INRH</i> .	Specialist
19	<b>Mr</b> Osvaldo Martínez Torres	Bureau of Integrated Water Management, <i>INRH</i>	Deputy Director
20	<b>Mr</b> Francis Rodríguez	<i>INRH</i>	Official

21	<b>Dr</b> Rafael Bosque	<i>ISPEJ</i> . Varona <i>MINED</i>	Specialist
22	Yudis Cabrera, <b>Engineer</b>	National Bureau for Information Technology, Communications and Automation ( <i>INRH</i> )	Director
23	<b>Ms</b> Emma Lores	<i>INRH</i> Branch School	Managing Director
24	2Karen Leiva Felix, <b>Engineer</b>	<i>INRH</i>	National Director of Science, Technology and Innovation
25	Margarita Fontova de los Reyes, <b>Engineer</b>	<i>SCNCH</i> , <i>INRH</i>	Official
26	<b>Dr</b> Maray Garrido Monagas	Hydraulic Research Centre.	Professor at <i>CIH - CUJAE</i>
27	Víctor Villalejo García, <b>Engineer</b>	National Institute of Water Resources <i>INRH</i>	Senior Specialist
28	Liliana Dorticós, <b>Engineer</b>	Infrastructure and Investment Bureau, <i>INRH</i>	Official
29	Rosemaire Ricardo Batista, <b>M.Sc.</b>	<i>OSDE GIAT</i>	Official
30	Juan Carlos León Gil, <b>M.Sc.</b>	Institute of Tropical Geography, <i>IGT</i>	Official
31	<b>Dr</b> David Marón	Ministry of Higher Education.	Professor at the Faculty of Civil Engineering, <i>CUJAE</i>
32	Alexis Acosta Cruz, <b>Engineer</b>	Water, Urban Drainage and Sanitation Bureau, <i>INRH</i>	Director
33	Ramón Rodríguez Rivero, <b>Engineer</b>	<i>SCNCH</i> , <i>INRH</i>	Official
34	<b>Dr</b> Yoermes González Harambournes	Ministry of Higher Education.	Director of <i>CIH CUJAE</i>
35	Omar Pérez Bucarano, <b>Engineer</b>	Bureau for Water Balance, <i>INRH</i>	Director

### **1.1.2 Meetings held**

For the period under review (November 2018-March 2021), seven meetings were planned, one in November 2018, two in 2019 (February and October), three in 2020 (January, July and December) and one in February 2021. The addition of one meeting in 2020 compared to 2019, combined with the change in dates, reflected the need to conduct a mid-term review (July 2020) to check progress on executing the Business Plan during the first semester. Then, in December, a study of the overall performance (instead of October as usual) was carried out.

Although the scheduled meetings took place in 2018 and 2019, only one out of the three planned face-to-face meetings could be held in 2020, namely the one in January. Following the measures aimed at controlling the COVID 19 pandemic in Cuba and as part of the protocols to prevent its spread, the meetings planned for July, December and February 2021 had to be postponed.

Nevertheless, the Chairperson of the Committee, assisted by the Secretary, actively exchanged information with the Committee members, such as hydrological related commemorations, calls for events, analytical documents (particularly drafts of the IHP Phase IX Strategy) and other matters of public interest. During this period, face-to-face meetings were replaced whenever possible, and given Cuba's technological conditions, digital and IT tools for networking and video conferencing with internal systems implemented by the organisations were used.

## **1.2 IHP activities at a national level.**

### **1.2.1 National/local scientific and technical events**

- The XIV International Congress of Hydraulic Engineering, the II FORUM of Young Water Professionals, the X International Seminar on Integral Water Use and the 2nd International Workshop on Integrated Watershed Management, Havana, were held under Cubagua 2019.
- A National Workshop on New Technologies in Hydraulic Works, in Holguín, *SIH-UNA/ICC*, 2018.
- The XII International Symposium on Structures and Geotechnics of the II International Scientific Convention UCLV, 2019.
- The V, VI, VII and VIII National Workshops on IWRM for river basins in Cuba, Villa Clara and Granma, 2018, 2019 and 2020, respectively.
- The National Workshop on Use and Reuse of Wastewater, Varadero, 2019.
- The Integrated Drought Management Workshop, Guantánamo, 2019.

- A provincial Workshop on Integrated Basin Management in Guantánamo, Cienfuegos, Holguín, Santiago de Cuba, Villa Clara and Sancti Spíritus, between 2018 and October 2020.
- The Cuba-France water workshop, Havana, 2019.
- An annual activity involving volunteer observers of rainfall measurement, INRH, Santiago de Cuba and Matanzas, 2018 and 2019.
- The II and III National Workshop on Ecological and Environmental Flows. Between 2018 and 2019, CoNaPHI-Cuba assumed responsibility to organise and run the IV Workshop on Ecological and Environmental Flows in Cuba, drafting a Cuban regulation proposal to determine such flows.

Following Law 124 on Land Waters in Cuba and its Regulation Decree 337, the water balance in Cuba has been made annually and by hydrographic basins, where all water uses are considered, including those affecting the environmental and ecological balance.

However, requests for these water values for environmental and ecological use are made to INRH by the Ministry of Science, Technology and Environment. Therefore, to support this activity, the Committee developed the drafted regulation to benefit from its members' experience gathered in Cuba and abroad.

The Committee also organised the conference called "Drainage basins: an overview of their delimitations" presented by Francis Rodriguez Rodriguez during the Committee meeting held in January 2020. This expert's lecture promoted the exchange of views, emphasising the need to draw up a document containing precise terminology on basin concepts and the methodology for their delimitation, as per Cuban legal norms. This initiative allows meetings to move beyond bureaucratic formalities and become a forum for knowledge exchange.

### **1.2.2 Participation in IHP programmes and working groups**

- We are members of the FRIEND and IFI groups, HELP Group, Eco-Hydrology Group, ISI Group and Groundwater (GRAPHIC, SIDS project).
- In January 2019, we participated in the II Technical Meeting organised by the Steering Committee of the IHP Intergovernmental Committee from 16 to 19 January 2019 at UNESCO, Paris.  
This meeting focused on the Organisation's Reforms and Strategic Transformation process, notably regarding forecasts, work and IHP's significance within the Natural Sciences field.

The Cuban delegation emphasised the need to empower the Committees, consolidate their institutional framework and visibility, and promote a closer regional interconnection to establish links facilitating cooperation and capacity development.

Cuba endorsed France's proposal to establish a Category II Centre named International Centre for Interdisciplinary Research on Water Dynamics.

It is worth drawing attention to the Committee members' analysis and discussion concerning the IHP Phase IX Strategic Plan proposals in this context.

Five working groups were assembled for this critical theoretical and methodological exercise. Each group was tasked with studying one of the three main pillars defined in Phase IX, or one out of the two cross-section tools. Each of these groups offered insights and criteria, which were then discussed jointly during the Committee meeting and echoed in the wording of drafts 1, 2 and 3 of the Secretariat's Phase IX Strategy.

Mr Luaces Socarrás represented Cuba at the 58<sup>th</sup> session of the IHP Bureau, which was held from 10 to 12 September in UNESCO Paris. The aim was to ensure full participation; therefore, a working meeting was held with the Cuban National Commission's specialist for UNESCO and the Committee's Secretary, Carmen Maury, to review the agenda and draft the national statements.

### **1.2.3 Supported or sponsored studies and research.**

- Sanitary and storm drainage study in urban basins of Havana.
- Hydrological study of the basin that feeds into the Zaza reservoir.
- Filter for household-scale water purification by using zeolite as a filter material.
- Feasibility study and design for rainwater abstraction in Santa Cruz del Sur communities (*Tarea Vida* - Life Task).
- Hydrogeological evaluation of the water complex associated with the ophiolite complex in Camagüey.
- Hydrological study of the Cauto del Paso dam and other surveys.
- Update of the early warning system (EWS) for drought events in the Ciego de Avila province.

- Natural vulnerability map of the Camagüey province.
- Comprehensive solid waste management manual for Cuban rural communities, monitoring water table contamination.
- Development of water hammers from molten semi-finished products.
- Hydrochemical studies to determine nitrate levels in underground sources of the area concerned southern Havana-Matanzas plain (Follow-up by the municipality, in cooperation with the Institute of Soil Science).

#### **1.2.4 Collaboration with other national and international organisations or programmes**

- *Atlas Nacional de Cuba, LX Aniversario*, which is the first multimedia National Atlas of Cuba.
- OP-15 project, Water 2 project, on sustainable land management, supporting the National Programme Against Desertification and Drought in Cuba.

#### **1.2.5 Other Initiatives**

- Celebration of World Water Day.
- Celebration of the Cuban Engineer's Day.
- Celebration of Cuban Science Day.
- *Trazaguas* contest. National Workshop for Promoters of the *Agua Amiga* Project.
- *PAURA* Competition. Water-Saving and Rational Use Programme run together with the Ministry of Education.
- National celebration of World Environment Day.
- National celebration of Hydraulic Workers' Day, 10 August. *INRH & SIH-UNAICC*.

### **1.3 Training/educational activities.**

#### **1.3.1 Specific courses to be held.**

The Committee runs courses on Integrated Water Resources Management for River Basin, a Diploma in Hydrogeology and Hydrology for the Acquisition, Processing, Analysis and Forecasting of Hydrological Data Applied to Groundwater and Surface Water Management.

The Master's Degree in Hydraulic and Environmental Engineering at *CUJAE's* Hydraulic Research Centre is still available.

### 1.3.2 Participation in IHP courses.

In 2020, Cuba was banned from accessing the ZOOM platform, thus preventing Cuba from participating in multiple UNESCO promoted forums for networking and learning purposes.

Given this challenge, which is still in place for some national institutions, although an improvement within the UNESCO arena has been observed, the Committee set as a principle **the most significant possible outreach to calls for proposals both within and outside the membership**. The Committee would indirectly contribute to the knowledge exchange, the visibility of UNESCO's work, notably from Montevideo, and the networking with other national and foreign stakeholders in Hydrology. The calls for proposals were made to:

- Webinar on "Management tools for the water sector in Latin America and the Caribbean to address COVID-19" (April/2020)
- Online Skills Training Symposium promoted by the IHE Delft Institute for Water Education and sponsored by UNESCO.
- Newsletters 9 and 12 issued by the Conference of Ibero-American Water Directors (CODIA).
- Webinar on "Safe Access to Water in times of crisis and beyond - Voices from Caribbean Youth" (July/2020)
- Online Seminar Series on "Droughts in Latin America and the Caribbean."
- Web Seminar on "Situation of glaciers in Latin America."
- Web course on "Harmonisation of legal frameworks in water resources planning & management. An approach for Latin America and the Caribbean."

### 1.4 Cooperation with Centres sponsored by UNESCO.

On 12 and 13 February 2019, a scientific-technical workshop called "*Flood Prevention in Havana*" was held at the Hotel Meliá Habana. The event, sponsored by UNESCO, was jointly hosted by the Ministry of Science, Technology and Environment (CITMA), the UNESCO Regional Office for Culture in Havana and the Embassy of the Kingdom of the Netherlands in Cuba. Several experts from the National Institute of Water Resources and members of the Cuban IHP Committee attended.

The initiative fell within the framework of the actions designed by UNESCO to support Cuba in implementing the *Tarea Vida: Plan del Estado Cubano para el Enfrentamiento al Cambio Climático* (Life Task: Cuban State Plan to confront Climate Change). For two days, researchers, academics, and national decision-makers held productive discussions with experts from the Delft Institute for Water



Education (IHE) based on the key topics set out in the national climate change strategy.

Participants underlined the importance of assessing comprehensive, sustainable solutions adapted to Cuba's current situation to reduce and address flooding on the capital's coastal coastline and mitigate its consequences. This effort reflects the need to protect the exceptional global value of a littoral zone that features elements included in the Declaration of *"Old Havana and its Fortification System"* as a UNESCO World Heritage Site, which renders this multidisciplinary meeting all the more opportune and valuable.

The diversity of the institutions involved, together with valuable insights, information and proposals shared, enabled to outline a critical roadmap to address and overcome a significant impact on the residents' lives - and on the image and history of a 500-year-old city that represents the main pride and symbol of the Greater Antilles identity.

## 1.5 Publications

- Martínez Y. & Villalejo V. M. (2019). "Ecohidrología-Ecohidráulica: claves para la gestión integrada de los recursos hídricos" (Ecohydrology-Ecohydraulics: keys to integrated water resources management), Revista Ingeniería Hidráulica y Ambiental, XL (2): 95-109, Universidad Tecnológica de La Habana "José Antonio Echeverría", Cujae, La Habana, Cuba, ISSN: 1815- 591X.
- Martínez Y. & Villalejo V. M. (2020). "Caudal ambiental: herramienta ecohidrológica en la gestión integrada de los recursos hídricos" (Environmental flow: an ecohydrological tool for integrated water management), Revista Ingeniería Hidráulica y Ambiental, XLI (1): 56-70, Universidad Tecnológica de La Habana "José Antonio Echeverría", Cujae, La Habana, Cuba, ISSN: 1815-591.
- Martínez Y. & Villalejo V. M. (2019). "Los caudales ecológicos y ambientales como herramientas para la gestión integrada de los recursos hídricos" (Ecological and environmental flows as tools for integrated water resources management"), Memorias del XIV Congreso Internacional de Ingeniería Hidráulica y el X Seminario Internacional del Uso Integral del Agua, La Habana, Cuba, 19 to 23 March 2019, Editorial Obras, Digital edition ISBN:[978-959-247-177-1](#)
- Vega X., Luaces C. A. & Martínez Y. "Comparación de diferentes soluciones para la delimitación y codificación de cuencas hidrográficas. Aplicación Almendares-Vento" (Comparison of different solutions for watershed delimitation and coding. Almendares-Vento application), Memorias del XIV Congreso Internacional de Ingeniería Hidráulica y el X Seminario Internacional del Uso Integral del Agua, La Habana, Cuba, 19 to 23 March 2019, Editorial Obras, Digital Edition ISBN: [978-959-247-177-](#)

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- Martínez Y. (2019). “Los caudales ecológicos y ambientales como herramientas para la gestión integrada de los recursos hídricos” (Ecological and environmental flows as tools for integrated water resources management), Memorias del Segundo Coloquio de Análisis y Diseño de Obras Hidráulicas en el XII Simposio Internacional de Estructuras y Geotecnia de la II Convención Científica Internacional UCLV 2019, Villa Clara, Cuba, 23 to 30 June 2019, Digital Edition ISBN: [978-959-312-372-3](#)

## **1.6 Participation in scientific events.**

### **1.6.1 Events held across the country.**

- As shown in point 1.2.1.

### **1.6.2 Participation in events abroad.**

- Participated in IWRM Workshops at *CODIA* and *InterCODIA*.

## **1.7 Other regional activities.**

### **1.7.1 Institutional relations/cooperation.**

- Participated in the IHP Bureau meetings in January and September 2019.
- Regional Meeting: 70 years of UNESCO's presence in Latin America and the Caribbean, Montevideo, Uruguay.
- Session on "Water Security in Latin America and the Caribbean: Challenges for the Future", Session about the Progress on the 2030 Agenda and SDG6 in Latin America and the Caribbean.
- CoNaPHI Cuba and CoNaPHI Mexico.
- Criteria on the Second Strategy Draft for the Ninth Phase of IHP (IHP-IX) (2022-2029).

### **1.7.2 Completed and ongoing scientific projects.**

## **2. Future activities**

### **OVERVIEW**

- Maintain organic life and operation, including the role of the water sciences and management within the community.
- Continue to expand its membership across individuals, institutions and disciplines, to add a more significant and deeper scope to its current work.
- Further using videoconferencing for training, preparation and outreach purposes both nationally and internationally.
- Further participation in the ongoing Regional and Global Programmes and assess its involvement in others.

- Refine its role as a niche for evaluation and exchange on critical issues impacting the quantity and quality of national water resources, with scientific and technical vision, by exploiting artificial intelligence and Integrated Water Resources Management at a river basin level.
- Promote and support new projects with external funding support to scale up the results currently achieved.
- Implement, as appropriate, annual action plans in the context of the identified IHP-UNESCO Phase IX 2022-2029.
- Further participation in regional and international forums and competitions to showcase the results achieved by Cuban researchers in water science and management.
- Reinforce the liaison and working relations with other existing UNESCO National Programme Committees in the country.
- Raise awareness of the Committee's work through the media, social media and websites.
- Increase the number of papers to be published in the AquaLAC scientific journal.
- Boost the use of video conferencing both nationally and internationally.

**Carlos Alberto Luaces Socarrás, M.Sc. Eng.**

Secretary of the National Council of Hydrographic Basins

Head of the Secretariat of National River Basin Council Authority

**President of CoNaPHI Cuba**

