

**Format for Biennial Reports by UNESCO's Water-related Centres on activities related to the IHP in the period (June 2014 – May 2016)**

**1. Basic information on the centre**

Name of the Centre		<b>Internatinal centre for coastal ecohydrology</b>
Name of Director		Luis Chícharo
Name and title of contact person (for cooperation)		Luis Chícharo, Professor, Director
E-mail		lchichar@ualg.pt
Address		Universidade do Algarve Campus de Gambelas FCT- building 8 8005-139 Faro Portugal
Website		www.icce.org
Location of centre		Faro
Geographic orientation *		X <input type="checkbox"/> global <input type="checkbox"/> regional
Region(s) (for regional centres)		European
Year of establishment		----
Year of renewal assessment		----
Signature date of most recent Agreement		2010
<b>Themes of activities during reporting period</b>	Focal Areas ·	<input checked="" type="checkbox"/> groundwater <input checked="" type="checkbox"/> urban water management <input type="checkbox"/> rural water management <input type="checkbox"/> arid / semi-arid zones <input type="checkbox"/> humid tropics <input type="checkbox"/> cryosphere (snow, ice, glaciers) <input checked="" type="checkbox"/> water related disasters (drought/floods) <input type="checkbox"/> Erosion/sedimentation, and landslides <input checked="" type="checkbox"/> ecohydrology/ecosystems <input type="checkbox"/> water law and policy <input type="checkbox"/> social/cultural/gender dimension of water <input checked="" type="checkbox"/> transboundary river basins/ aquifers <input checked="" type="checkbox"/> mathematical modelling <input type="checkbox"/> hydroinformatics <input type="checkbox"/> remote sensing/GIS <input checked="" type="checkbox"/> IWRM <input type="checkbox"/> Watershed processes/management <input checked="" type="checkbox"/> global and change and impact assessment <input checked="" type="checkbox"/> water education <input checked="" type="checkbox"/> water quality <input type="checkbox"/> nano-technology <input checked="" type="checkbox"/> waste water management/re-use <input type="checkbox"/> water/energy/food nexus <input type="checkbox"/> water systems and infrastructure <input checked="" type="checkbox"/> other: (please specify): estuarine and coastal ecohydrology
	Scope of Activities ·	<input type="checkbox"/> vocational training <input checked="" type="checkbox"/> postgraduate education <input type="checkbox"/> continuing education <input checked="" type="checkbox"/> public outreach <input checked="" type="checkbox"/> research <input checked="" type="checkbox"/> institutional capacity-building <input checked="" type="checkbox"/> advising/ consulting

\* check on appropriate box  
· check all that apply

	<input type="checkbox"/> software development <input type="checkbox"/> data-sets/data-bases development <input type="checkbox"/> other: (please specify) _____
Support bodies <sup>1</sup>	Government of Republic of Poland University of the Algarve
Hosting organization <sup>2</sup>	University of Algarve
Sources of financial support <sup>3</sup>	Main: Ministry of Science and Higher Education  Additional: - Framework Programme (H2020) - UNESCO Activity-Financing Contracts - Consulting
Existing networks and cooperation <sup>4</sup>	<u>International Networks:</u> - LOICZ – land ocean interaction for coastal zones - Erasmus Mundus (EU) - UNESCO IHP – co chair of the Scientific Steering Committee for the Ecohydrology Programme, - UNESCO-IHP Ecohydrology Demosites Project <u>International Projects:</u> - Developing an integrated model to predict abiotic habitat conditions and biota of rivers for application in climate change research and water management IMPACT (ERA-IWRM)
Governance	X director and governing board <input type="checkbox"/> other: (please specify) _____ Link to election of board members to the IHP Intergovernmental Council (IGC) and hosting country IHP National Committee  Frequency of meetings: once every year(s) Existence of UNESCO presence at meetings
Institutional affiliation of director	University of Algarve, Campus Gambelas
Number of staff and types of staff	total number of staff (full-time, or equivalent) : 5 number of staff who are water experts: 2 number of visiting scientists: 11 and postgraduate students: 7  _____
Annual turnover budget in USD	

## 2. Activities undertaken in the framework of IHP in the period June 2014 – May 2016

- 2.1 Educational activities (i.e., those with accreditation) that directly contributed to the IHP-VIII (Appendix 1) and WWAP  
*Please include here those activities which led to accreditation of degrees, or those held in formal school settings.*

<sup>1</sup> please specify bodies that cover the operational costs of the centre, and other essential costs such as salaries and utility bills, and that provide institutional support to ensure centre's sustainability

<sup>2</sup> if different from support bodies

<sup>3</sup> please specify sources of main budgetary and extra budgetary funds to implement projects

<sup>4</sup> please write international networks, consortiums or projects that the centre is part of, or any other close links that the centre has with international organizations or programmes, which are not already mentioned above

ERASMUS MUNDUS Master Course on Ecohydrology (ECOHYD)  
(partnership with Univ Algarve, UNESCO-ERCE (Poland), UNESCO-IHE  
(Netherlands), Cau Kiel (Germany), Univ La Plata (Argentina), Univ Espirito  
Santo Brazil)

Master in Urban Water Cycle (at Univ Algarve)

- 2.2 Research activities that directly contributed to the IHP-VIII activities  
*Please include research/applied projects outputs such as publications that  
directly contributed to the IHP-VIII and WWAP objectives*

Research projects:

Developing an integrated model to predict abiotic habitat conditions and  
biota of rivers for application in climate change research and water  
management IMPACT (ERA-IWRM)

List of publications attached in annex.

- 2.3 Training activities that directly contributed to the IHP-VIII and WWAP  
objectives

1. Courses prepared and delivered within the ECOHYD - Erasmus Mundus  
Master of Science in Ecohydrology, realized in the collaboration with the  
University of Algarve
2. Training course in Coastal Ecohydrology – Exuma, Bahamas (UNESCO  
LAC)
3. Training course in Coastal ecohydrology and ecosystem services –  
Univ Espirito Santo, Brazil

### **3. Collaboration and linkages**

- 3.1 Participation in major international networks, programmes, partnerships  
with other UN or other International Agencies, media and professional  
bodies

- member of the Scientific Steering Committee of the UNESCO IHP  
Ecohydrology Programme;
- Coordinator of the LOICZ node for Africa and Middle East
- Erasmus Mundus

- 3.2 Participation in meetings related to the IHP and UNESCO (e.g. the  
UNESCO General Conference, the UNESCO Executive Board, the IHP  
Intergovernmental Council and/or other meetings organized by IHP)

- Meeting of water related UNESCO Category II Centres and UNESCO  
Chairs, and COP21, "Water, People and Cooperation: regional  
perspectives in a context of climate change", 2-3 December 2015, Paris,  
France
- UNESCO Ecohydrology Scientific Advisory Committee, 25 February  
2016, Paris, France
- UNESCO centres meeting, Beijing, 16-18 May 2016
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- 3.3 Collaboration and networking with other UNESCO category 1 or 2  
institutes/ centres**

- 3.3.1 cross-appointment of directors of the category 1 or 2 institutes or centres on the governing board

Governing Member of UNESCO HIDROEX (Brazil) and UNESCO ERCE  
Poland

- 3.3.2 exchange of information on activities such as training/educational materials, and funding opportunities

Cooperation with ERCE on funding and educational activities

- 3.3.3 exchange of staff, most notably professionals and students

Visits of:

- Prof. Demin Zhou from Capital Normal University, China;
- Prof . Paul Dubowy – Army Corps of Engineers
- Prof Azime Tezer . Istanbul University
- Prof. Marcelo Gaviño – Univ La Plata, Argentina
- Prof Gilberto Barroso – UFES Brazil
- Prof Maciej Zalewski ERCE, Poland
- Prof William Mitsch,
- Prof Jeff Camkin, Australia
- Prof Olfa Said, Univ Bizerte Tunisia
- Prof Hoda Soussa, Ain Sharms Univesity, Egypt
- Prof Susana Neto, Lisbon University

- 3.3.4 implementation of joint activities, such as workshops, conferences, training programmes, joint projects, field visits, software and data sharing, knowledge exchange and publications

Sumer courses in Brazil

Ecohydrology conferences at UNivesity Algarve and in Lodz, in collaboration with ERCE

Knowledge sharing

Erasmus mundus Master Course on Ecohydrology (ECOHYD) with ERCE, UNESCO-IHE Delft, Lodz University & CAU Kiel University.

Water education in African Portuguese Speaking Counties

Knowledge exchange with:

- UNESCO ERCE, Poland
- UNESCO LAC

- 3.4 Relationships with the UNESCO field and regional office whose jurisdiction covers the country of location

- 3.5 Relationship with the UNESCO National Commission and the IHP National Committee in the country of location and with other organizations of other countries

Very good and close relation, involving sharing of information and join activities

- 3.6 Relationship with other UNESCO-related networks, such as UNESCO Clubs, ASPnet, and UNESCO chairs

Collaboration with the UNESCO Chair in Ecohydrology UNESCO Chair in "Ecohydrology: water for ecosystems and societies" at the University of Algarve

#### **4. Communication**

##### 4.1 Communication and knowledge dissemination activities undertaken in the framework of IHP

###### Meetings/conferences/courses organized & co-organized by ERCE:

- The International Symposium on Ecohydrology, Biotechnology and Engineering: Towards Harmony between the Biogeosphere and Society on the basis of Long-Term Ecosystem Research, 17 – 19 September 2014, Łódź (Poland)
- Ecohydrology' 2015 Measuring, Modeling and Managing of the natural processes related to water flows, Social values of the linked ecosystem services 21 - 23 September 2015, Lyon (France)
- Erasmus Mundus Master of Science in Ecohydrology, realized in the collaboration with the University of Algarve
- Training course in Coastal Ecohydrology – Exuma, Bahamas (UNESCO LAC)
  - Training course in Coastal ecohydrology and ecosystem services – Univ Espirito Santo, Brazil

###### Participation in meetings/conferences:

- Ecohydrology 2015. 21-23 September 2015, Lyon (France)
- The International Symposium on Ecohydrology, Biotechnology and Engineering: Towards Harmony between the Biogeosphere and Society on the basis of Long-Term Ecosystem Research, 17 – 19 September 2014, Łódź (Poland)

##### 4.2 Policy documents and advice

#### **5. Update on Centre Operations**

##### 5.1 Membership of the Board of Governors between designated period

##### 5.2 Key decisions made (attach minutes of meetings)

#### **6. Evidence of the Centre's Impacts**

##### 6.1 Science Impacts (Major contributions to the science, technology, education, and regional and/or international cooperation in the field of water)

##### 6.2 Knowledge Transfer Impacts (Major achievements in the dissemination of knowledge and technology transfer)

###### Lectures for international bodies and organizations:

##### 6.3 Policy Impacts (advice sought by government and other bodies and evidence of inputs into policy arena)

#### **7. Future activities that will contribute directly to IHP and/or to WWAP**

##### 7.1 Operational Plan (attach if available)

Strategic Plan linked with IHP-VIII (Appendix 1). Focal areas within IHP-VIII

ICCE is dedicated mostly to the following Themes of the Eighth Phase of the IHP (2014-2021) Water security: addressing local, regional, and global challenges

## **THEME 1: WATER-RELATED DISASTERS AND HYDROLOGICAL CHANGE**

Focal area 1.1 - Risk management as adaptation to global changes

## **THEME 2: GROUNDWATER IN A CHANGING ENVIRONMENT**

Focal area 2.3 - Adapting to the impacts of climate change on aquifer systems

Focal area 2.4 - Promoting groundwater quality protection

## **THEME 3: ADDRESSING WATER SCARCITY AND QUALITY**

Focal area 3.4 - Addressing water quality and pollution issues within an IWRM framework - improving legal, policy, institutional, and human capacity

Focal area 3.5 - Promoting innovative tools for safety of water supplies and controlling pollution

## **THEME 5: ECOHYDROLOGY, ENGINEERING HARMONY FOR A SUSTAINABLE WORLD**

Focal area 5.2 - Shaping of the catchment ecological structure for ecosystem potential enhancement – biological productivity and biodiversity

Focal area 5.3 - Ecohydrology system solution and ecological engineering for the enhancement of water and ecosystem resilience and ecosystem services

Focal area 5.5 - Ecohydrological regulation for sustaining and restoring continental to coastal connectivity and ecosystem functioning

## **THEME 6: WATER EDUCATION, KEY FOR WATER SECURITY**

## **8. Annexes**

8.1 List of publications released by the centre (there can be overlap with those listed in 2.3 above)

1. Encarnação, J., Leitão, F., Range, P., (...), Chícharo, M.A., Chícharo, L. .2015 . Local and temporal variations in near-shore macrobenthic communities associated with submarine groundwater discharges . *Marine Ecology* . 36 (4), pp. 926-941
2. Chícharo, L. , M. Zalewski. 2015.Introduction to Ecohydrology and Restoration of Estuaries and Coastal Ecosystems. *Earth Systems and Environmental Sciences, from Treatise on Estuarine and Coastal Science, Volume 10, 2011, Pages 1-5, Current as of 6 August 2015*
3. Shawkat Islam Sohel Md, Sharif Ahmed Mukul, Luis Chicharo. 2015. A new ecohydrological approach for ecosystem service provision and sustainable management of aquatic ecosystems in Bangladesh *Review Article. Ecohydrology & Hydrobiology, Volume 15, Issue 1, 25 February 2015, Pages 1-12*
4. Leitão, F., João Encarnação, Pedro Range, Rüdiger M. Schmelz, Maria A. Teodósio, Luís Chícharo. 2015. Submarine groundwater discharges create unique benthic communities in a coastal sandy marine environment. *Estuarine, Coastal and Shelf Science, Volume 163, Part B, 20 September 2015, Pages 93-98*
5. Gonçalves, R., Correia, A.D., Atanasova, N., (...), Ben-Hamadou, R., Chícharo, L. 2015. Environmental factors affecting larval fish community in the salt marsh area of Guadiana estuary (Algarve, Portugal). *Scientia Marina. 79 (1), pp. 25-34*
6. Range, P., Martins, M., Cabral, S., Matias, D., Chícharo, L. 2014. Relative sensitivity of soft-bottom intertidal macrofauna to increased CO<sub>2</sub> and experimental stress. *Marine Ecology Progress Series. 509, pp. 153-170*
7. Range, P., Chícharo, M.A., Ben-Hamadou, R., (...), Dellali, M., Chícharo, L. 2014. Impacts of CO<sub>2</sub>-induced seawater acidification on coastal Mediterranean bivalves and interactions with other climatic stressors. *Regional Environmental Change. 14 (SUPPL.1), pp. 19-30*
8. Carvalho Dill, A.M.M., Stigter, T.Y., Brito, R., Chícharo, M.A., Chícharo, L. . 2014. The combined use of radio frequency-electromagnetic surveys and chemical and biological analyses to study the role of groundwater discharge into the Guadiana estuary. *Ecohydrology. 7 (2), pp. 291-300*

9. Joaquim, S., Matias, D., Matias, A.M., (...), Chícharo, L., Gaspar, M.B. 2014. Biochemical and energy dynamics throughout the reproductive cycle of the striped venus *Chamelea gallina* (Mollusca, Bivalvia). *Invertebrate Reproduction and Development*. 58 (4), pp. 284-293
10. Leitão, F., Hughes, S.J., Máximo, I., Furtado, A., Chicharo, L. 2014. Document Habitat-oriented sampling of macroinvertebrates affects the determination of ecological status in temporary mediterranean river systems. *River Research and Applications*. 30 (10), pp. 1233-1247