

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		Centre for Water Law, Policy and Science
Name of Director		Dr Alistair Rieu-Clarke
Name and title of contact person (for cooperation)		Dr Sarah Hendry
E-mail		water@dundee.ac.uk
Address		University of Dundee, Carnegie Building, Dundee DD1 4HN Scotland, UK
Website		http://www.dundee.ac.uk/water/
Location of centre		city/town Dundee country Scotland, UK
Geographic orientation *		<input checked="" type="checkbox"/> global <input type="checkbox"/> regional
Region(s) (for regional centres)		
Year of establishment		2006
Year of renewal assessment		2012
Signature date of most recent Agreement		2014
Themes of activities during reporting period	Focal Areas ·	<input type="checkbox"/> groundwater <input 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 checked="" type="checkbox"/> water law and policy <input checked="" type="checkbox"/> social/cultural/gender dimension of water <input checked="" type="checkbox"/> transboundary river basins/ aquifers <input 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 type="checkbox"/> global and change and impact assessment <input type="checkbox"/> mathematical modelling <input checked="" type="checkbox"/> water education <input type="checkbox"/> water quality <input type="checkbox"/> nano-technology <input type="checkbox"/> waste water management/re-use <input checked="" type="checkbox"/> water/energy/food nexus <input type="checkbox"/> water systems and infrastructure <input type="checkbox"/> other: (please specify) _____
	Scope of Activities ·	<input type="checkbox"/> vocational training <input checked="" type="checkbox"/> postgraduate education <input checked="" type="checkbox"/> continuing education <input checked="" type="checkbox"/> public outreach <input checked="" type="checkbox"/> research

* check on appropriate box
· check all that apply

	<input checked="" type="checkbox"/> institutional capacity-building <input checked="" type="checkbox"/> advising/ consulting <input type="checkbox"/> software development <input type="checkbox"/> data-sets/data-bases development <input type="checkbox"/> other: (please specify) _____
Support bodies ¹	Scottish Government; University of Dundee; UK Government.
Hosting organization ²	University of Dundee
Sources of financial support ³	Main funding sources include the European Union; the UK Research Councils; national governments and development / aid agencies; international and national organisations, agencies and NGOs working in water such as the GWP, WWF, IUCN, Scottish Environment Protection Agency, Scottish Natural Heritage, Tweed Forum and Local Government (Scottish Borders Council).
Existing networks and cooperation ⁴	We cooperate with a wide variety of national and international organisations working in water and development, including other parts of the UNESCO family. Please see our responses below for more detail.
Governance	<input checked="" type="checkbox"/> 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 We attend the IHP IGC and also the UK IHP National Committee. We are associated through the National Committee and the UK UNESCO Commission with the IHP Region 1 Grouping. Frequency of meetings: once every 1 year(s) The Governing Board meets once / year and is chaired by the University Principal. A representative from UNESCO IHP attends that meeting. This year Dr Jiminez-Cisceros attended the Board. <input checked="" type="checkbox"/> Existence of UNESCO presence at meetings
Institutional affiliation of director	
Number of staff and types of staff	total number of staff (full-time, or equivalent) : 4 FT academics, 1 PDRA, 4 FT PhDs and 4 PT PhDs: 11 FTE plus administrative support staff working in the School of Social Sciences and the University of Dundee

¹ 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

² if different from support bodies

³ please specify sources of main budgetary and extrabudgetary funds to implement projects

⁴ 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

	<p>_____</p> <p>number of staff who are water experts: __11</p> <p>number of visiting scientists and postgraduate students:</p> <p>Visiting scientists and researchers vary in number and duration of stay.</p> <p>_____</p>
Annual turnover budget in USD	£430,000

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.

We would see all our educational activities contributing to IHP-VIII, Theme 6 FA 6.3 (tertiary education).

We currently deliver an LLM (Master of Laws) in Water Law, awarded by the University of Dundee. We accept research students to study for LLMs by Research and PhDs, again awarded by the University. We deliver specialist teaching on other taught Masters programmes within the University (LLMs and MSc programmes) and have delivered tuition within UNESCO-IHE to their Masters students. Staff also co-supervise PhD students in other institutions.

- 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

Our publications in this period include peer reviewed literature, project reports and other outputs. All of the work of the Centre contributes in some way to some of the focal areas of the IHP-VIII and to the WWAP objectives. A full list of our publications is given in section 8.1. Several of our outputs have been published in collaboration with UNESCO, such as:

- **Hendry S**, *Frameworks for Water Law Reform* (monograph) CUP International Hydrological Series (2015).
- **Rieu-Clarke A, Moynihan, R and Magsig, B.**, *Transboundary water governance and climate change adaptation- international law, policy guidelines and best practice application* (UNESCO WWAP Technical Paper 2015)
- **Rieu-Clarke A.**, 'Transboundary Hydropower Projects on the Mainstream of the Lower Mekong River – The case of public participation and its national implications for basin states', in Tignino, M. and Sangbana, K., eds., *Public Participation and Water Resources Management – Where do we stand in international law?* (UNESCO 2014).
- Blackstock, Martin-Ortega and **Spray**, 'Implementation of the European Water Framework Directive: what does taking an ecosystem services-based approach add?', in J. Martin-Ortega, R.C. Ferrier, I.J. Gordon, and S. Khan, *Water ecosystem services: a global perspective*, CUP International Hydrological Series (2015).

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

We deliver an Annual Workshop on International Law and Transboundary Freshwater, at the University of Dundee. This is now in its 7th year and annually attracting 30-40 mid-career professionals from government and international organisations, in collaboration with, e.g., SIWI, UNESCO-IHP, GWP, IUCN, University of Strathclyde and UNECE.

In June 2015, we piloted a workshop The Science of IWRM for Law and Policy experts, at the University of Dundee.

In-country / regional training workshops

We have held 9 major training events since September 2014. Geographic scope:

- Africa-wide training workshop: funded by IGAD, ANBO and GWP
- Partnership with GWP, IGAD, ANBO, UNECE and University of Makerere
- Orange-Senqu basin (Botswana, Lesotho, Namibia and South Africa)
- Save basin (Mozambique and Zimbabwe)
- Lebanon
- Jordan
- Cambodia
- Bolivia

Participants: 300+ experts dealing with water issues; Civil servants, academia, civil society leaders, UN and other international organisations; Lawyers, hydrologists, engineers, economists, journalist, etc.

Diploma on International Legal Arrangements for Transboundary Waters within the Context of Climate Change (August 2015 – November 2015)

- We contributed to the design of a Diploma and delivery of a Module related to International Law of Watercourses; and lectures on Law, Water and Climate Change. Funded by IDRC, and in partnership with Universidad Cordillera, University Strathclyde, IUCN and Agua Sustentable and University of Geneva.

We collaborated with UNECE on the delivery of two workshops:

- Workshop on the UNECE Water Convention: Key aspects and opportunities for Lebanon, Beirut, Feb 2015.
- National workshop on Frameworks for Transboundary Water Cooperation: Focus on the UNECE Water Convention, Amman, Jordan, March 2015.

3. Collaboration and linkages

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

See 2.3 and 8.2 for our engagement with others in our training activities; and see also sections 4 and 6.

The Centre is a member of the OECD Water Governance Initiative, which meets biannually.

The Centre is involved in developing a 'Roadmap' for the future implementation of the Global Water Conventions, with WWF, IUCN, GWP, Green Cross International and UNECE:

- How to co-ordinate activities related to promotion of UN Water Conventions
- How to engage with other key partners, e.g. UNESCO-IHP (PCCP and ISARM)

- How to best use collective expertise and resources
- Opportunities for joint fund-raising
- Core activities
 - Awareness raising and training
 - Materials
 - Research
- Proposal for medium-sized Global Environmental Facility (GEF) project
GEF IW:Learn MOOC Freshwater Legal Frameworks and Agreements Course

Our research is usually carried out in large interdisciplinary projects with multiple partners and funding sources. Key networks and funders within such projects currently include:

International Development Research Centre (Canada) 'Deltas Vulnerability and Climate Change: Migration and Adaptation' (2014-2018)

DFID, Economic and Social Research Council & National Environment Research Council, 'Health, Livelihoods, Ecosystem Services and Poverty Alleviation in Populous Deltas' (2012-2016)

National Environment Research Council (UK RC) Senior Research Fellowship with Welsh Government (2015-16)

European Commission EU FP7 'Lagoons' (2012-2014)

Centre for Research Excellence in Water (Scottish Government) 'Catchment Management for Drinking Water Protection' (2014-2017) – partners including Centre for Ecology and Hydrology, Westcountry Rivers Trust, James Hutton Institute, Scottish Environment Protection Agency

Centre for Research Excellence in Water (Scottish Government) 'Land Use for Natural Flood Management' (2014-15) – partners Scottish Agricultural College, Herriot Watt University.

Centre for Research Excellence in Water (Scottish Government) 'Valuing Water' (2014-15)

Centre for Research Excellence in Water (Scottish Government) 'Governance of Small Scale Rural Supply' (2015-16)

Scottish Government 'Land Use Strategy' 2014 – partners Tweed Forum and Scottish Borders Council.

Scottish Government / Water Industry Commission for Scotland 'Customer Forum' advisory panel (ongoing)

Australia Indonesia Infrastructure Research Award Scheme 'Review of Legal and Regulatory Framework in Indonesia', with the Centre for Regulation, Policy and Governance (CRPG), Universitas Ibn Khaldun Bogor (2015)

Welsh Government 'Devolution and Legislative Alignment of Water Services' 2014-15 with ICF Consulting

Scottish Government / Drinking Water Quality Regulator 'Regulation of Small Scale Rural Supply' with ICF Consulting (2015)

Tweed Forum / Scottish Government 'Eddleston Water Phase 3' (2013-15); Extension 2015- partners Scottish Environment Protection Agency and British Geological Survey

Scottish Government 'Land Use Strategy' Phase 2 (2015) – partners Tweed Forum and Scottish Borders Council.

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)

We usually attend the UK National Committee annually. We report to that Committee and that is one opportunity for us to meet with the wider Science community working on IHP and other UNESCO programmes in the UK, as well as with representatives of the relevant Government departments, regulators etc., and the UK National Commission. Unfortunately this year the Committee clashed with our Governing Board but we submitted a report.

In November 2014 the Centre attended the launch at UNESCO Paris of the Food- Energy-Environment-Water (FE2W) network led by Quentin Grafton, the UNESCO Chair of Water Economics and Transboundary Water Governance from the ANU.

In December 2014 the Centre attended a meeting of the Category2 Water Centres in Koblenz, Germany.

In December 2015 the Centre attended a meeting of the Cat2 Water Centres in Paris, coinciding with the COP21.

We have been invited to a meeting of all the Cat2 Science Centres in Beijing in May 2016 and will attend if funds are available and dependent on the agenda.

We will attend a meeting of the Region 1 partners in Koblenz in May 2016.

We will attend the IHP Intergovernmental Council in June 2016.

In 2014 we worked with UK National Commission for UNESCO on a policy brief related to the mapping of Category 2 Centres.

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

No.

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

3.3.3 exchange of staff, most notably professionals and students

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

In late 2014 staff from the International Centre for Water Cooperation (ICWC) at SIWI and from UNESCO-IHE visited the Centre to discuss collaboration in water law, policy and governance. We are developing an MoU with ICWC, and this will relate to both research and teaching / training.

For several years and until 2015 Centre staff have delivered some teaching on the Masters programmes at UNESCO IHE, although not this year.

We agreed to contribute guest lectures to an Erasmus Plus proposal for a taught Masters programme being developed by the International Centre on Coastal Ecohydrology (ICCE, Portugal) along with other partners.

We regularly welcome visiting researchers (staff and students) to the Centre and the University.

The Annual International Water Law workshop which is held in Dundee every June has brought together several partners that assist us in the promotion and delivery of the training programme, including several colleagues from SIWI.

Our training activities and the partners involved are narrated above at section 2.3 and below at 8.2. Our joint projects are set out in section 3.1. Our knowledge exchange is discussed in sections 4 and 6, and our publications in sections 2.2 and 8.1.

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

We liaise with UNESCO staff via UNESCO Paris. Some of our training workshops have been co-delivered with UNESCO Paris and UNESCO regional offices, including the 2015 training workshops in Lebanon and Jordan. The Centre also participated in a project workshop held in Botswana in 2015 linked to UNESCO's GRETA project.

- 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

See 3.2 above.

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

We have carried out some activities with staff from the ANU working with Prof Grafton (see 3.2 above), as well as supporting them by contributing to their *Global Water Forum* website.

4. Communication

- 4.1 Communication and knowledge dissemination activities undertaken in the framework of IHP
- 4.2 Policy documents and advice

All our training and education activities contribute to our work for the IHP especially Theme 6 and FA 6.3 (tertiary education) – see 2.1 and 3.3 above.

We regularly give policy advice, for example on our research projects for national governments (see 3.1 above). Outputs from these projects are listed at 8.1 below ('Reports / Other').

We are regularly asked to contribute to media outputs including press and radio.

In 2015 we gave 33 presentations at conferences and workshops, in 12 countries, often as invited keynote speakers.

We were involved in the hosting of the biannual IWRA World Water Congress in Edinburgh, supported by Scottish Government under its 'Hydro-Nation' agenda, with a Centre representative on the organizing committee.

5. Update on Centre Operations

- 5.1 Membership of the Board of Governors between designated period

Professor Sir Pete Downs, University Principal and Vice-Chancellor (Convenor)
Dr Blanca Jimenez-Cisneros, UNESCO-IHP (or her nominee)
Mr Jon Rathjen, Water Industry Team, Scottish Government
Mr Alan Sutherland, Chief Executive, Water Industry Commission for Scotland
Dr Harry Dixon, Centre for Ecology and Hydrology, Secretary, UK National Hydrology Committee
Dr John Francis, retd (ex UNESCO UK Commission and Government Scientist)
Dr Bill Cosgrove, IIASA Interim Water Program Director

Professor John Rowan, Dean of Social Sciences
(Until 2015, Professor Ian Ball, Dean of the Graduate School; and Professor Christopher Whately, Head of the College of Arts and Social Sciences)

5.2 Key decisions made (attach minutes of meetings)

The Board met in September 2014 and a note of that meeting is attached (Appx.2). The Board has met again in March 2016. The delay was due to restructuring within the University, and when minutes are available they will be forwarded.

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

The biggest impact that the Centre has had is on the shaping of laws and policies within different countries, as well as supporting policy-makers and advisors (including advocacy groups). The collaborations with various government departments in different countries through the aforementioned training workshops has been particularly significant in this regard. The stakeholder workshops organised in India and Bangladesh as part of the DECCMA and ESPA-Deltas projects are also significant in translating research outputs into use.

The impact of the Centre's work was reflected in a case study entitled *Enhancing Shared Knowledge on the Law Governing International Watercourses*, which was submitted to the 2014 UK Research Excellence Framework (REF) assessment. The REF panel rated the case study as '**having demonstrated outstanding impact in terms of its reach and significance**'.

In 2015, the University was also awarded the **WWF Leaders for a Living Planet** prize for the Centre's leadership in international water policy.

In 2015, the Tweed (our UNESCO HELP Basin) won the **UK River Prize**.

Centre staff have been extremely active at major international water-related meetings, as co-organisers, members of scientific steering committees, presenters and/or panellists. A particular highlight of the year was the Centre's high profile presence during the World Water Congress in Edinburgh in May 2015.

The research projects in section 2.2 above are often commissioned by or for national governments in order to address specific policy problems.

The appointment of a member of the Centre staff as a **NERC Senior Policy Fellow** is a further measure of esteem.

In addition, to these activities Centre staff continue to contribute to various transdisciplinary networks, which offer an important means by which to disseminate research outputs, raise the profile of Centre, build relationships with other institutions, and identify potential research projects and partners.

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

7.1 Operational Plan (attach if available)

Our operational plan is being developed to reflect both changes in the Centre staffing and changes in the structure of the University, and linked to the development of our new Strategy (below). This was discussed at our recent Governing Board.

7.2 Strategic Plan linked with IHP-VIII (Appendix 1). Focal areas within IHP-VIII the centre plans to contribute to and specific actions the centre will undertake to align its activities with the strategic plan for IHP-VIII

Our Centre Strategy is attached, in draft form, as discussed at our recent Governing Board (Appx.3).

8. Annexes

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

Research outputs

Monographs and Edited Collections

- **Hendry S**, *Frameworks for Water Law Reform* (monograph) CUP International Hydrological Series (2015).
- Tanzi, A, McIntyre, O, Kolliopolos A, Kinna R and **Rieu-Clarke, A**, eds, *The UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes : Its contribution to international water cooperation*, Brill International Water Law Series (May 2015)
- **Rieu-Clarke A, Allan A. & Hendry S**, *Handbook on Water Law and Policy*, Routledge (due to be completed May 2016)
- Delahay, R.J. & **Spray, C.J.** (Eds) (2015). Proceedings of the Oxford Lead Symposium. *Lead Ammunition: understanding and minimising the risks to human and environmental health*. Edward Grey Institute, The University of Oxford, UK.
- **Rieu-Clarke A.**, Yidhego, Z & Cascao A, *The Nile River and the Grand Ethiopian Renaissance Dam*, Water International Special Issue (to be published 2016).

Journal papers

- Bongert and **Spray C** (2015) 'A comparison of ecosystem services mapping tools for their potential to support planning and decision-making on a local scale', *Journal of Ecosystem Services* (Elsevier)
- Rouillard J and **Spray C**, 'Managing adaptive water governance: lessons learned from regional experiences in integrated catchment management', *Journal of Regional Environmental Change* (Springer, in press)
- Bracken, Oughton, Donaldson, Cook, Forrester, **Spray**, Cinderby, Passmore & Bissett (in press). Flood risk management; an approach to managing cross-border hazards. *Natural Hazards*
- Cook, Forrester, Bracken, **Spray** & Oughton (in press). Competing Paradigms of Flood Management in the Scottish/English Borderlands. *Disaster Prevention and Management*. Vol 25(3).
- **Hendry S** (2016) 'The Customer Forum: Putting Customers at the Centre of Regulating Water Services' (in press).
- Hendry S (2016) 'Scottish Water – A Public Sector Success Story' (*Water International Special Issue*; (accepted for publication).
- **Hendry S** (2015), 'Country Report: Scotland: Reform of Environmental Regulation in Scotland', *IUCNAEL e-journal Issue 6 2015 325-360* <http://www.iucnael.org/en/e-journal/current-issue->
- **Hendry S** (2015), 'Improving the physical condition of Scotland's water' *Environment Scottish Planning and Environment Law* 168:30 April 2015.

- **Rieu-Clarke A.**, 'Notification and Consultation Procedures under the Mekong Agreement: Insights from the Xayaburi Controversy', 5 *Asian Journal of International Law* 143 (2015).
- **Rieu-Clarke A.**, 'Transboundary Hydropower Projects Seen Through the Lens of Three International Legal Regimes: Foreign Investment, Environmental Protection and Human Rights', 3(1) *International Journal of Water Governance* (2015).
- **Rieu-Clarke A.**, 'A cure or a curse? Entry into force of the UN Watercourses Convention and the Global Opening of the UNECE Water Convention', *Questions in International Law*, e-journal, <http://www.qil-qdi.org/a-cure-or-a-curse-entry-into-force-of-the-un-watercourses-convention-and-the-global-opening-of-the-unece-water-convention/>.
- Kløve, B. Balderacchi, M. Gemitzi, A. **Hendry, S.** Kværner, J. Muotka T. Preda, E., 'Protection of groundwater dependent ecosystems: Current policies and future management options', 16 *Water Policy* 1070 (2014)
- Parker F and **Hendry S.**, 'Competition without Privatisation: the Scottish Model of Governance and Regulation', Dual publication 23(6) *Journal of Water Law* 229-233 (2014) and 20(1) *Utilities Law Review* 3-7 (2014)
- Lim, M., **Allan, A.**, 'The use of scenarios in legal education to develop futures thinking and sustainability competencies', submitted to *Law Teacher*, July 2015

Book chapters

- **Hendry, S.** and Gooch, G. (2016): Ecosystem Services and Water Security In: Potschin, M., Haines-Young, R., Fish, R. and Turner, R.K. (eds) *Routledge Handbook of Ecosystem Services*. Routledge, London and New York, pp 501-508. ISBN 978-1-138-02508-0
- **Rieu-Clarke A.**, 'Determining Sovereign Rights and Duties over International Watercourses: The Contribution of the International Law Commission and the UN General Assembly', in Tvedt, T., McIntyre, O. & Woldesadik, T.K., eds., *A History of Water: Sovereignty and International Water Law (Volume 2)*, (IB Tauris 2015).
- **Rieu-Clarke A.**, 'Implementing Water Agreements' in Martin, P and Kennedy, A., eds., *Effective implementation: the next frontier of environmental law* (Edward Elgar 2015) (with Gooch J).
- **Rieu-Clarke A.**, 'Transboundary Hydropower Projects on the Mainstream of the Lower Mekong River – The case of public participation and its national implications for basin states', in Tignino, M. and Sangbana, K., eds., *Public Participation and Water Resources Management – Where do we stand in international law?* (UNESCO 2014).
- **Rieu-Clarke A.**, 'Remarks on the Drafting History of the Convention', in Tanzi, A, McIntyre, O, Kolliopoulos A, Kinna R and Rieu-Clarke, A, eds, *The UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes : Its contribution to international water cooperation* (Brill 2015).
- **Rieu-Clarke A.**, 'The Sustainability Principle', in Tanzi, A, McIntyre, O, Kolliopoulos A, Kinna R and Rieu-Clarke, A, eds, *The UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes : Its contribution to international water cooperation* (Brill 2015).
- A Lillebø, **C Spray**, et al, 'Pan-European coastal lagoons: integrated vision for ecosystem services, environmental SWOT analysis and human well-being.' in Lillebø, A, Stalnacke, P and Gooch, D eds, *Coastal Lagoons in Europe: Integrated Water Resource Strategies* (Earthscan 2015)

- Blackstock, Martin-Ortega and **Spray**, 'Implementation of the European Water Framework Directive: what does taking an ecosystem services-based approach add?', in J. Martin-Ortega, R.C. Ferrier, I.J. Gordon, and S. Khan, *Water ecosystem services: a global perspective* (CUP / International Hydrological Series 2015)
- V. Giannini, A. A. **Allan**, C. Hutton, and C. Giupponi, 'Adaptive IWRM Responses to Cope with "What-If?" Scenarios', in Sharma, N., and Flugel, W-A, eds, *Applied Geoinformatics for Sustainable Integrated Land and Water Resources Management (ILWRM) in the Brahmaputra River Basin*, Springer 2015 (ISBN 978 81 322 1967 5)

Reports/ other

- **Allan, A.**, Barbour, E. (2015), *Integrating science, modelling and stakeholders through qualitative and quantitative scenarios*, ESPA Deltas Working paper no.5, available at www.espadelta.net.
- **Allan, A.**, Adams, H., (2015). *Stakeholder Engagement Plan*. DECCMA Working Paper, Deltas, Vulnerability and Climate Change: Migration and Adaptation, IDRC Project Number 107642. Available online at: www.deccma.com
- **Allan, A.**, Hissen, N.F., Ghosh, A., Samling, C.L., Tagoe, C. A., Nelson, W., Mensah, A., Salehin, M., Mondal, Md. S., **Spray, C.** (2015), *WP1 – Stakeholder Mapping Consolidated Fast Track*. DECCMA Working Paper, Deltas, Vulnerability and Climate Change: Migration and Adaptation, IDRC Project Number 107642. Available online at: www.deccma.com
- Hendry, S. Spray, C. and Allan, A (2015) *The Value of Scotland's Water Resources - Legal Analysis* (CREW Publication) Available online at: http://www.crew.ac.uk/sites/www.crew.ac.uk/files/publications/Value_of_water_Legal_Analysis.pdf
- **Rieu-Clarke A, Moynihan, R and Magsig, B.**, *Transboundary water governance and climate change adaptation- international law, policy guidelines and best practice application* (UNESCO WWAP Technical Paper 2015)
- **Spray C**, *Scottish Borders pilot regional land use framework* (2015)
- **Spray C**, *Lessons Learned Report for Scottish Government on taking an Ecosystem Approach to the regional Land Use pilots* (2015)
- **Spray, C.J.**, Arthur, S., Bergmann, A., Bell, J., Beevers, L. and Blanc, J. (2015), *Land management for increased flood resilience*, CREW CRW2012/6. Available online at: www.crew.ac.uk/publications

8.2 List of training courses conducted (there can be overlap with those listed in 2.1 above)

We deliver an Annual Workshop on International Law and Transboundary Freshwater, at the University of Dundee. This is now in its 7th year and annually attracting 30-40 mid-career professionals from government and international organisations, in collaboration with, e.g., SIWI, UNESCO-IHP, GWP, IUCN, University of Strathclyde and UNECE.

In June 2015, we piloted a workshop The Science of IWRM for Law and Policy experts, at the University of Dundee.

In-country / regional training workshops

We have held 9 major training events since September 2014. Geographic scope:

- Africa-wide training workshop: funded by IGAD, ANBO and GWP
- Partnership with GWP, IGAD, ANBO, UNECE and University of Makerere
- Orange-Senqu basin (Botswana, Lesotho, Namibia and South Africa)
- Save basin (Mozambique and Zimbabwe)
- Lebanon
- Jordan
- Cambodia
- Bolivia

Participants: 300+ experts dealing with water issues; Civil servants, academia, civil society leaders, UN and other international organisations; Lawyers, hydrologists, engineers, economists, journalist, etc.

Diploma on International Legal Arrangements for Transboundary Waters within the Context of Climate Change (August 2015 – November 2015)

- Contributed to design of Diploma and delivery of Module related to International Law of Watercourses; and lectures on Law, Water and Climate Change. Funded by IDRC, and in partnership with Universidad Cordillera, University Strathclyde, IUCN and Agua Sustentable and University of Geneva.

Workshop on the UNECE Water Convention: Key aspects and opportunities for Lebanon, Beirut, Feb 2015.

National workshop on Frameworks for Transboundary Water Cooperation: Focus on the UNECE Water Convention, Amman, Jordan, March 2015.

Appendix 1

Overview of the Core Programme 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
- Focal area 1.2 - Understanding coupled human and natural processes
- Focal area 1.3 - Benefiting from global and local Earth observation systems
- Focal area 1.4 - Addressing uncertainty and improving its communication
- Focal area 1.5 - Improve scientific basis for hydrology and water sciences for preparation and response to extreme hydrological events

THEME 2: GROUNDWATER IN A CHANGING ENVIRONMENT

- Focal area 2.1 - Enhancing sustainable groundwater resources management
- Focal area 2.2 - Addressing strategies for management of aquifers recharge
- Focal area 2.3 - Adapting to the impacts of climate change on aquifer systems
- Focal area 2.4 - Promoting groundwater quality protection
- Focal area 2.5 - Promoting management of transboundary aquifers

THEME 3: ADDRESSING WATER SCARCITY AND QUALITY

- Focal area 3.1 - Improving governance, planning, management, allocation, and efficient use of water resources
- Focal area 3.2 - Dealing with present water scarcity and developing foresight to prevent undesirable trends
- Focal area 3.3 - Promoting tools for stakeholders involvement and awareness and conflict resolution
- 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 4: WATER AND HUMAN SETTLEMENTS OF THE FUTURE

- Focal area 4.1 - Game changing approaches and technologies
- Focal area 4.2 - System wide changes for integrated management approaches
- Focal area 4.3 - Institution and leadership for beneficitation and integration
- Focal area 4.4 - Opportunities in emerging cities in developing countries
- Focal area 4.5 - Integrated development in rural human settlement

THEME 5: ECOHYDROLOGY, ENGINEERING HARMONY FOR A SUSTAINABLE WORLD

- Focal area 5.1 - Hydrological dimension of a catchment– identification of potential threats and opportunities for a sustainable development
- 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 5.4 - Urban Ecohydrology – storm water purification and retention in the city landscape, potential for improvement of health and quality of life
- 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

- Focal area 6.1 - Enhancing tertiary water education and professional capabilities in the water sector
- Focal area 6.2 - Addressing vocational education and training of water technicians
- Focal area 6.3 - Water education for children and youth
- Focal area 6.4 - Promoting awareness of water issues through informal water education
- Focal area 6.5 - Education for transboundary water cooperation and governance

Appendix 2: Minutes of Governing Board September 2014

Centre for Water Law, Policy and Science (under the auspices of UNESCO) Governing Board

Thursday 26 and Friday 27 September 2014

Present: Prof Pete Downes (Chair), Mr Andrew Allan, Mr Ian Ball, Mrs Fiona Brown, Mr John Francis, Dr Sarah Hendry, Mr Bisher Imam, Mr John Rathjen, Dr Alistair Rieu-Clarke, Prof C Spray

In attendance: Mrs Lynn Richards

Apologies: Dr Bill Cosgrove, Mr Alan Sutherland

Welcome and Introductions

P Downes welcomed everyone to the meeting. He informed members that the purpose of the meeting was to review the Centre's performance over the last year and to develop its future. Members were asked to note that Prof P Wouters and P G Gooch had taken the opportunity of voluntary severance and the role of Centre Director was being fulfilled by I Ball.

The Board acknowledge the major contribution that Prof M Bonell made to the Centre and the depth of expertise and new knowledge which emanated from his research.

The agenda was approved.

Overview and Financial Report

The meeting opened with a presentation of the financial summary presentation of the Centre's activities to date by F Brown and I Ball. The presentation outlined a future forecast where the Centre reached a break-even position within a two year period. The reasons for this would be mainly due to the significant reduction in staff salaries, along with the positive and confident approach to grant winning currently being adopted by the team. However, it was stressed that ongoing monitoring of the Centre's financial position was critical to ensure the forecast financial targets were achieved.

Discussion followed concerning ways of how income growth should be tackled. P Downes informed the external Board members that the University was downsizing in a number of areas and that this could be an opportunity for the Centre to strive and create its own sustainable future. Collaboration across disciplines was stressed as important. B Imam reminded the meeting that whilst increasing income generation, the Centre must also align itself with UNESCO initiatives.

The Centre staff presented the current focal areas of the Centre: S Hendry presented the alignment of Centre activities with the UNESCO strategic plan; C Spray presented the alignment of Centre activities with the Scottish Government Hydro-Nation Agenda; A Allan and A Rieu-Clarke gave an overview the Centre's activities and J Rowan presented an overview on how the University's activities linked with the Centre.

B Imam felt that the Centre should link its strengths with three or four UNESCO initiatives, identifying which theme it would contribute to. He stressed that this should be done quickly. He also recognised that because this was a global Centre its reach would be worldwide.

P Downes stressed it was critical that the four remaining staff were central to the development of the future strategy of the Centre and this would require them to work as a cohesive unit.

27 September

P Downes informed the meeting that a private meeting of the Board would be held to discuss the future and direction of the Centre. He noted that team-working was evident and that this had consolidated the Centre and its staff.

P Downes thanked Centre staff for their presentations and their contribution to the discussion.

Recommendations

Before P Downes delivered the Recommendations he made the staff aware of the Board's observations:

There had been a step change in a number of aspects and there had been clear alignment of the work carried out with key stakeholders. The Board recognised a strong response to the previous recommendations. There appeared to be a clear understanding of the Centre's USPs and the deployment of these had been advantageous. Costs had been kept under control. Achievement of a financial position which was better than break-even and could be maintained would be key.

The recommendations were:

1. The Centre's strengths should be consolidated.
2. Focus on a sound method for winning research grants – lead in some and support in others. The Board understood the resource issue for the Centre in this area.
3. The Centre was asked to maintain its areas of excellence in leadership and expertise. These strengths were recognised.
4. CPD and module related workshops – the staff were asked to try to develop these in order to create an income for the future.
5. UNESCO Conventions – the Centre staff were encouraged to participate fully in UNESCO conventions. The Board members believed that this strategy would allow Centre staff to influence policy and to build status and reputation within the international community. There were 35 Category II Centres with which the Centre could seek partnerships. Centre staff were encouraged to instigate and lead on an individual initiative which would bear fruit and involve alumni and members of the UNESCO international community.
6. The demonstration of the ownership of the Centre by staff had impressed the Board. There had been clear evidence of governance and leadership of the Centre. The staff were encouraged to maintain their roles with I Ball maintaining the role of Centre Director.
7. The Centre's Place in the University. To develop sustainably, the Centre must build through increase in activity and an increase in income. This could be achieved through developing new teaching in association with other departments – a firmer relationship with the School of the Environment and CECHR would be beneficial in this respect.

I Ball responded by saying he felt the Recommendation were very measured. He would certainly encourage and facilitate where possible, development and growth of the Centre's current successes: PhD portfolio; links with the School of the Environment – the creation of niche programmes eg policy related to water management around the world; links with CECHR; linkages with the School of Humanities via collaboration with Politics, for example energy, water and food

security was currently a huge international theme where multidisciplinary research could play a key role in informing policy formulation.

P Downes suggested that a communications strategy should be produced to convey the positive mood of the Governing Board. In particular, Prof Patricia Wouters' enthusiasm and contribution should be highlighted, along with the value her ongoing contribution would make to the Centre. A Rieu-Clarke confirmed that Prof Wouters would be keen to develop plans with the Centre.

I Ball confirmed that the outcome of the meeting would be to produce a table of deliverables and outputs using results based management approach.

26 September 2015
W I Ball

Appendix 3: Draft Centre Strategy

Centre for Water Law, Policy & Science Strategy to 2020

Core Vision

Improve access to water for all, through the promotion of equitable and sustainable water governance, and in particular by enhancing the interface between water law and policy and science

Context

The **Centre for Water Law, Policy & Science (under the auspices of UNESCO)** (CWLPS) was established in 2008, and renewed for a 6 year period in May 2014 pursuant to an agreement between UNESCO and the UK Government, and in partnership with the Scottish Government and the University of Dundee. Since its creation, the Centre has become a global *focal point for research excellence, postgraduate teaching and professional training on the interface between water law, policy and science*. It currently has 4 dedicated full time research staff, as well as postgraduate assistants, PhD students, associates and alumni from around the world. This network constitutes a global community that brings together experts from diverse backgrounds, experiences and disciplines, with a common interest in improving water governance and addressing the interface between water law, policy and science.

In terms of research excellence, the Centre has participated in, and continues to deliver, **multi-partner, international and transdisciplinary** research projects within the field of water resources management. The Centre's roles in these projects has included:

- identifying pathways between scientific knowledge and law and policy processes;
- analysing and strengthening the design and implementation of existing legal frameworks;
- collaborating with project partners and wider stakeholders to improve the implementation of water resources management and project impact.

Funding for such initiatives has been secured through a **diverse portfolio of sources**, including national and international donor agencies, governments, UN organizations, research councils and NGOs.

The Centre has developed a reputation as a global hub for the delivery of capacity development programmes in water law, policy and science. It has successfully run international professional training courses for water resources experts both in Dundee and across the world. Academic programmes include a long-established Masters in Water Law and associated PhD Programme. In addition, the Centre actively works on related graduate and PhD programmes in such areas as natural resource management, catchment hydrology, ecosystem services and environmental law. Together with the UNESCO 'family' and other external partners, the Centre also works to develop both training and educational programmes relevant to our vision.

As a vital complement to its research and capacity building programmes, the Centre actively contributes to numerous national, regional and global initiatives, such as the World Water Forums, Stockholm World Water Week, the University Partnership on Transboundary Waters, and the Associated Programme on Integrated Flood Management.

Impact is high on the agenda of the Centre work. Through its research activities the Centre has sought to influence law and policy reform processes at the national and international levels, such as, supporting policies related to ecosystem services and poverty alleviation in Bangladesh, working with Scottish Government and other regulators on the better management of water services, and supporting the implementation of water and land management strategies in the Tweed River Basin. An impact case study that the Centre submitted to the last UK *Research Excellence Framework* (2014), was described as having 'demonstrated outstanding impact in terms of its reach and significance'. This year the university was awarded WWF's *Leaders of Living Planet Award* for its work related to international water law and policy, and the Centre's research helped the Tweed basin win the UK River Prize.

The Centre's Strategy to 2020

The Centre's strategy is designed to support the attainment of its vision, through three central components:

- **Research,**
- **Capacity development,** and
- **Outreach and Impact**

Each of these key components is explained in further detail below.

The Centre's strategy contributes to the vision and research agenda of the School of Social Sciences and the University of Dundee, especially in seeking to transform lives through the management of global resources. It also contributes to the aims of UNESCO's International Hydrological Programme, especially the relevant themes and focal areas of IHP-VIII, and to the Scottish Government's vision of Scotland as a Hydro-Nation.

Research

The Centre will conduct world-class research that meets the challenges of developing efficient and equitable water governance systems. It will generate innovative insights into the relationship between the design and implementation of water-related laws and policies at multiple scales, alongside the scientific tools, methods and approaches.

The Centre will build upon and expand existing research themes that explore the interface between water law, policy and science. In so doing, the Centre will contribute to, and where appropriate lead, large-scale research projects that are designed to better understand that interface across a wide range of settings, including developed and developing countries, water scarce and water abundant regions, different scales (local to transboundary), and different water sources (aquifers, lakes, river basins).

In order to ensure that its research is stakeholder driven, activities will include working with government and non-governmental organisations, businesses, community groups and water users. It will draw upon and expand its existing portfolio of funding sources, which includes the UK Research Councils (ESRC & NERC), EC Horizon 2020, and Scottish Government.

In line with the UK *Research Excellence Framework*, the Centre will produce research outputs that are world-leading in terms of originality, significance and rigour, and in their impact on end users. Working with partners and stakeholders, such research will draw upon a range of social and physical sciences to offer innovative techniques and methodologies to analyse water-related law and policy design and implementation. This will include, *inter alia* research within the Tweed UNESCO HELP Basin on stakeholder engagement and the Ecosystem approach in the context of

participative catchment management, and activities that draw upon the research interests and expertise of other HELP Basins across the world.

The Centre will act as a focal point and facilitator for bringing together research staff from the across the University of Dundee, and associated researchers, for example from the James Hutton Institute, in order to enhance research collaborations, and increase the profile and impact of water-related research undertaken within the University.

Developing the next generation of researchers equipped to tackle complex issues relating to the interface between water law, policy and science will be a priority for the Centre. The Centre will therefore further develop a vibrant PhD and early career researcher community that will help support the implementation of its specific themes.

Key indicators

- Outputs submitted to REF2020
- Number of research proposals submitted and partners
- Level of research income, successful projects, partners and list of funders
- List of PhD students and completion rates
- Research seminars held

Capacity development

Through the development and delivery of a suite of accessible, research-informed and world-class educational and professional training programmes, the Centre will continue to grow as a global focal point for capacity development on the interface between water law, policy and science.

The Centre will work with colleagues across the School of Social Sciences and the University of Dundee, to extend its provision of teaching. This will include the existing LLM in *Water Law*, and contributions to other taught postgraduate programmes. The further development of on-line modules will open up provision to those unable to travel and/or in full-time employment. Through these developments the Centre will seek to build an innovative Masters programme focused on the water law, policy and science interface, which builds upon the expertise of the Centre, its partners and associates, and the wider University community. This will include an international marketing and recruitment strategy to attract water practitioners from the UK and across the world.

The Centre will explore the potential for developing joint or collaborative degrees with partners in different parts of the world. This would include modules and degrees via joint delivery, training the trainers, and long-term strategic partnerships with core institutions.

Together with its partners, the Centre will develop a series of CPD short courses for delivery both in Dundee and overseas that are focused on the interface between water law, policy & science, and are targeted at water practitioners that currently, or have the potential to, influence water laws and policy processes within their respective countries.

Key indicators

- List of modules delivered, including on-line, and student numbers
- List of CPD courses delivered together with participant numbers
- Partnerships with other institutions to deliver postgraduate modules and CPD short courses

Outreach and Impact

The Centre will develop its national and international profile as a global focal point for matters relating to the interface between water law, policy and science. The Centre will also, through its research and capacity development efforts, act as a catalyst and facilitator to strengthen both the design and implementation of water-related laws and policies globally and locally. Key to the effective delivery of outreach and impact will be the development of a Stakeholder Engagement Strategy.

The centre will contribute to law and policy reform processes in Scotland, the UK and overseas, with a view to improving water-related law and policy frameworks in a way that better accounts for emerging scientific knowledge, methods, tools and approaches. This will include strategic partnerships with institutions that are capable of supporting the Centre's vision and the implementation of its research and academic programmes. This will include improving professional practice through the delivery of innovative practitioner-orientated CPD and academic programmes.

The Centre will publish outputs of its scientific and legal research in peer-review national and international journals, and through presentations at academic conferences and workshops. It will focus particularly on inter-disciplinary research findings and those that contribute to the interface between law, science and policy. The Centre will also publish a series of policy and technical briefs that are targeted at law and policy 'influencers' that reflect its major research outputs, including the key findings of research project reports, journal papers, PhD dissertations and Masters theses.

The Centre will convene and contribute to interdisciplinary scientific symposia and practitioner conferences aligned to its vision. This will include running a regular water seminar / webinar that will attract both external and University staff presenters. The Centre will expand and maintain a depository of multi-media research outputs through various digital platforms, including the Centre's website, twitter, Linked-In group, newsletter and blog.

The Centre will strengthen its existing links with UNESCO, including the IHP Programme, working with Member States and Associate Members of UNESCO, with UNESCO Category II Centres and Water Chairs; with UNESCO-IHE Delft; and with the UK Commission and UK Hydrology Committee; as well as developing links with other relevant international organisations such as the WMO with a view to the wider dissemination of its research outputs and their eventual uptake in law and policy reform processes. The Centre will also align to and support the implementation of Scotland's Hydro-Nation agenda, working with Scottish Government, the Water Industry Commission, Scottish Environment Protection Agency and other stakeholders, including the Centre for Research Excellence in Water.

The Centre will develop and nurture a vibrant community of honorary staff and alumni, representing practitioners and academics working at the interface between water law, policy and science across different regions of the world. In addition the Centre will develop an 'associates' programme for University of Dundee staff who support the Centre's vision and delivery of the Centre's academic programme, as well as partners in other allied institutions.

Key indicators

- List of law and policy reform processes that Centre staff have been active in
- List of law and policy decision-makers/ influencers participating CPD short courses and postgraduate programmes
- List of presentations at academic and practitioner conferences, seminars, workshops, etc.
- List of policy briefs published by Centre staff and target audience
- List of international water conferences, seminars, workshops, etc. convened by Centre staff

- List of users of various multi-media outlets, including website, twitter, linked-in, newsletter and blog.