

## 6<sup>th</sup> SWAN Progress Meeting Program 2015

### *Outputs and Perspectives of the Transatlantic Dialogue*

April 21-24, 2015

Sofia, Bulgaria

**Tuesday, April 21**

#### **OUTPUTS OF THE TRANSATLANTIC DIALOGUE**

Location: Hotel “Arena di Serdica”, Arena Conference Hall

#### **9.00 – 13.00 Outputs of the Transatlantic Dialogue**

Background information:

The sessions will be dedicated to the researchers’ work on the Tucson Basin case study with special emphasis on the preparation of the book WATER BANKRUPTCY IN THE LAND OF PLENTY. The outreach of the session will be the execution of collaborative work and acknowledging the outputs of the Transatlantic dialog on water. Each researcher will be able to present in a talk its own and/or collective work on the case study within 30 min (20 min presentation and 10 min guided discussion). Regarding the integration of the researches into the book, the presentations will encompass the entire investigation process and the results that have been accomplished (final results). The closing TBCS session will be related to a discussion on the book publication details. Finally, there will be the possibility of an informal discussion between the participants in order to improve their research work, cooperation and synergies.

#### **9.00 – 11.00 Session 1: Outputs of the Transatlantic Dialogue**

Subtitle: *Presentations of the book papers by researchers*

*Facilitator:* Kremena Boyanova

*Presentations:*

**9.00** Water use and sustainability in the Tucson basin: Implications of a spatially neutral groundwater management – Violeta Cabello (USE) [abstract – page 8]

**9.30** A Comparative Analysis of Stakeholder Engagement in Water Management between Tucson Basin (AZ) and Ebro basin (SP) – Alba Ballester (USE) [abstract – page 9]

**10.00** Challenges of Urban Growth, Water and Wastewater: the Southern Arizona Story – Graciela Schneier (CNRS) [abstract – page 9]

**10.30** Presentation of co-authoring papers and papers of non-present authors - Frank Poupeau

*11.00 – 11.30 Coffee Break*

**11.30 – 13.00 Session 2: Outputs of the Transatlantic Dialogue - continuation**

Subtitle: Presentations of the book papers by researchers

*Facilitator: Rositsa Yaneva*

*Presentations:*

**11.30** Quantification of Water-related Ecosystem Services in the Upper Santa Cruz Watershed, Arizona, USA – Kremena Boyanova (NIGGG-BAS) [abstract – page 10]

**12.00** Mapping Ecosystem Services Supply and Demand for Policy and Practice – Qualitative Assessment in Pantano Wash Watershed – Rositsa Yaneva (NIGGG-BAS) [abstract – page 11]

**12.30** Where is the Scientist's Place at the Table? - Susan Harris (UofA) [abstract – page 11]

**12.40** Water requirements of riparian vegetation in the Upper Santa Cruz River – Kristin Kuhn (UNESCO-IHE) [abstract – page 12]

Objectives of the morning sessions:

- ✓ To present consistent and structured first drafts of the research papers and their relevant results
- ✓ To get a feedback and guidance on the papers

*13.00 – 14.00 Lunch*

**14.00 – 15.30 Session 3: Book discussion**

*Facilitator: Frank Poupeau*

Objectives of the session:

- ✓ To run an open discussion about the book editorial, publication details, contents and closing chapter
- ✓ To select book publisher

*15.30 – 16.00 Coffee Break*

**16.00 – 17.00 Session 4: Board meeting / Students coordination – book chapters**

Objectives of the Students coordination session:

- ✓ To discuss the research outputs and additional coordination (if needed)
- ✓ To share the time to work collaboratively and modify the presented papers.

**17.00 End**

**17.30 Presentation:** “Fracking and Environment: What We Know and What We Do Not Know” – Prof. Chad Staddon (UWE) – by invitation of Bulgarian Geographic Society (BGS) as part of the program to celebrate Earth Day

## Wednesday, April 22

### FIELD TRIP

**7.30 – Departure from Sofia – Meeting point at conference venue - Hotel Arena di Serdica**

**8.30 – 11.30 - Guided tour at the Dragoman Marsh Karst Complex**

**11.30 – 13.30 – Bus drive to Cherepish Monastery along Iskar River Gorge**

**13.30 – 15.30 – Lunch and site-seeing at Cherepish Monastery**

**15.30 – 18.30 – Bus drive back to Sofia with stops at sites of interest**

- Eco trail and karts spring
- Sreden Iskar Cascade Hydro Power Plants along Iskar river

For more information on the sites and the trip, check the attached document **FIELD TRIP INFORMATION**.

## Thursday, April 23

Location: Hotel “Arena di Serdica”, Arena Conference Hall

**9.00 – 13.00 Feasibility Study Action Plan**

*Facilitator: Franck Poupeau*

**9.00** Welcome and Introduction

**9.15 Guest speaker: Nicolas Gulhot** - "Philanthropic Foundations and Social Science Research: Past, Present and Future" [abstract – page 7, author – page 7]

**10.00** Discussion

11.00 – 11.30 Coffee break

### **11.30 – 13.00 Feasibility Study Action Plan – continuation**

*Facilitator: Franck Poupeau*

#### Objectives of the sessions:

SWAN Final outcome in February 2016 will be the Feasibility Study for the Transatlantic Dialogue on Water. This session will be a continuation of the Feasibility Study Action Plan Discussion that took place during the 5th Progress Meeting in Tucson in November 2015; and its goal is to move forward in putting together the right ideas in a context of writing a funding proposal for its realization. This proposal needs to connect different fields, decision making activities, different scales (spatial, institutional), and integrate different perspectives.

13.00 – 14.00 Lunch

### **14.00 – 15.30 Perspectives of the Transatlantic Dialogue on Water**

*Facilitator: Hoshin Gupta*

**14.00** Frank Poupeau (CNRS)

**14.10** Hoshin Gupta (UofA)

**14.20** Nuria Hernandez-Mora (USE)

**14.30** Chad Staddon (UWE)

**14.40** Laszlo Hayde (UNESCO-IHE)

**14.50** Stoyan Nedkov/Mariyana Nikolova (NIGGG-BAS)

**15.00** Open discussion

#### Objectives of the session:

The SWAN project ends in April 2016. A continuation of the Transatlantic Dialogue on Water needs a platform and funding. Each team leader, or at least a representative from each team, will be asked to share the team's view on the opportunities for continuation of the existence of the seed network, based on their experience and ideas.

A key focus of the presentation should include suggestions for possible funding opportunities with different scopes - small bi-lateral projects (like OHMI) that can keep the discussion going; or big funding programs (e.g. [NATO Science for Peace and Security Programme](#), [UNESCO World Water Assessment Programme](#), [Horizon 2020](#), [EU Third health programme \(2014-2020\)](#) etc.), that can make SWAN 2 a reality.

In a broader perspective, it was suggested that the network of the Transatlantic Dialogue on Water can continue existing within other networks too. There are multiple networks build upon

topics, integrated in the SWAN discussions (e.g. [The Water Network](#), [Ecosystem Services Partnership](#), [International Association of Landscape Ecology](#), etc.). Through those networks the Dialogue on Water can continue developing within a working group or under other form. Members from each team probably participate in such networks, which can “host” our rising dialogue. This should be the second main focus of the presentations – ideas and suggestions for coexistence of our network.

15.30 – 16.00 Coffee break

### **16.00 – 17.30 Organization of the International Conference in Tucson 2016**

*Facilitator: Hoshin Gupta*

#### Objectives of the sessions:

At the conclusion of the Project in 2016, SWAN consortium will organize an International Conference that will be held in Tucson, USA. The main goal of this conference is to establish the main objectives for a SWAN 2 Project bringing together different research fields on Water.

During this session, the progress made on the Organization of the International Conference will be exposed. Moreover, the program for the Conference will be discussed, as well as the list of invited speakers.

### **17.30 – 19.00 Free time**

19.00 SWAN Official Dinner (Hotel Panorama Restaurant "La Terrazza di Serdica")

## **Thursday, April 23**

Location: Hotel “Arena di Serdica”, Arena Conference Hall

### **9:00 – 11:00 Scientific presentations of SWAN Teams activities.**

*Facilitator: Laszlo Hayde*

#### Objectives of the sessions:

Brief presentations of each SWAN team (UA, CNRS, USE, UWE, BAS-NIGGG, UNESCO-IHE) on the progress made since the last meeting, key lines of research of contracted students/staff, plans for future hires and lines of work until the final meeting in Tucson in February 2016.

**9.00** UA progress report

**9.20** UWE progress report

**9.40** USE progress report

**10.00** CNRS progress report

**10.20** BAS-NIGG progress report

**10.40** UNESCO-IHE progress report

*11.00 – 11.30 Coffee Break*

**11.30 – 12.45 Wrap Up - Reflections and Future Plans**

*Facilitator: Nuria Hernandez-Mora*

*Objectives of the sessions:*

Sharing the impressions and personal view on the outcomes of the meeting, key messages, lessons learned and foreseen next steps towards the finalization of the project in 2016. Each participant can open a discussion on topics that, according to him/her, were not addressed enough in the meeting.

**12.45 – 13.00 Closing words from Stoyan Nedkov**

**13.00 End of the 6<sup>th</sup> SWAN Progress Meeting**

*13.00 – 14.00 Lunch*

## ABSTRACT AND INFORMATION – GUEST SPEAKER

### PHILANTHROPIC FOUNDATIONS AND SOCIAL SCIENCE RESEARCH: PAST, PRESENT AND FUTURE – by Nicolas Guilhot

The talk will provide a brief historical overview of the role of American philanthropic foundations in the development of the modern social sciences and use this specific example to reflect upon the current funding landscape for social science research. The Rockefeller, Carnegie or Ford Foundations are well known for their early contributions to the institutionalization of the social sciences in the modern university. Whether they are celebrated for their contribution to the modern disciplines or criticized for their unaccountable power, they have shaped the academic landscape familiar to us. Yet, today's funding landscape is vastly differently from the one in which they initially operated. With the diminution of direct public funding for social science research, the shift toward project-based funding in the public sector, and the multiplication of corporate funding, the foundations may represent today an articulation between scholarly interests, funding possibilities and academic research that paradoxically preserves the autonomy of the latter at a time of shifting policies and strong pressure toward marketability.



**Nicolas Guilhot** (Ph.D. European University Institute 2001) is a tenured CNRS researcher in political science. Prior to joining CIRHUS, he was a visiting scholar at NYU's Institute for Public Knowledge and a program officer at the Social Science Research Council. He was previously a lecturer at the London School of Economics and at Columbia University. His work focuses on the history of the social sciences, international relations, political theory,

democracy and human rights. His publications include *The Invention of International Relations Theory: Realism, the Rockefeller Foundation and the 1954 Conference on Theory* (Columbia University Press, 2011), *The Democracy Makers: Human Rights and the Politics of Global Order* (Columbia University Press, 2005), *Financiers, Philanthropes: Sociologie de Wall Street* (Raisons d'agir, 2004, 2006) and numerous articles in *The Journal of the History of the Behavioral Sciences*, *Actes de la recherche en sciences sociales*, *Minerva*, *International Political Sociology*, *Constellations*, *Modern Intellectual History*, among other journals.

## **ABSTRACTS FOR TUCSON BASIN CASE STUDY BOOK SESSION WATER BANKRUPTCY IN THE LAND OF PLENTY**

*(1) Violeta Cabello, Nuria Hernández-Mora, Aleix Serrat-Capdevila, Leandro del Moral  
and Ed Curley*

### **WATER USE AND SUSTAINABILITY IN THE TUCSON BASIN: IMPLICATIONS OF A SPATIALLY NEUTRAL GROUNDWATER MANAGEMENT**

In the setting of the SWAN Project, recent discussions between researchers and stakeholders of the Tucson Basin helped develop a collaborative research agenda. The work presented here addresses some of the priority topics identified during our discussion. Combining a historical perspective on water use and its drivers with spatial analysis of groundwater management, it attempts to provide useful insights on the limitations and challenges of current strategies to achieve sustainability objectives in Arizona water policy. Specifically, the research looks at the changes induced by the CAP construction on water use and related socioeconomic evolution, the impact of conservation programs on water demand and the current spatial distribution of groundwater dynamics (recharge, pumping and water levels). Our results show how the CAP was a tipping point in the water metabolism multiplying the sources available but also the infrastructural and institutional complexity and fuelling economic development. Three main management strategies have been combined to pursue safe yield: conservation, growth control and substitution of groundwater by additional CAP supply. We uncover how growth limitation has only been enforced in agriculture which erratic demand drives overall demand variability. Conservation programs have been effective in the most important segment of the demand, the residential use of big urban areas. The recharge and recovery program was the key innovative solution in curbing overdraft although fiddly accounting and legal mechanisms veil an uneven progress towards safe yield. Disconnection of part of recovery from recharge sites entails local impacts over water table levels driven by mines and new developments. Larger biodiversity hotspots dependent on shallow groundwater coincide with these aquifer declining areas. While new infrastructures are being negotiated, vulnerability to CAP shortage of the different sub-regions and the high uncertainty over a distributed safe yield achievement and maintenance appear as core management issues for the next decade until the assessment of the Groundwater Management Act.

*(2) Alba Ballester and Kelly Mott Lacroix*

### **A COMPARATIVE ANALYSIS OF STAKEHOLDER ENGAGEMENT IN WATER MANAGEMENT BETWEEN TUCSON BASIN (AZ) AND EBRO BASIN (SP)**

This paper analyzes stakeholder engagement in water management in two areas with markedly different geographic, legal, and institutional frameworks. In our examination of the Tucson basin (Arizona) and Ebro basin (Spain) we will explore how different contexts have created different forms of participation, and the impact these differences have on water policies and adaptive management. This analysis includes a description of the different types of participation, a framework for the analysis of the different approaches to engagement, a list of indicators for measuring the impact of the different approaches on water policies and whether they enable or hinder adaptive management of water resources.

*(3) Graciela Schneier-Madanes, Ed Curley, Juan B. Valdes, Thomas Maddock III, Stuart Marsh, Kyle Hartfield and Eric Wildeit*

### **CHALLENGES OF URBAN GROWTH, WATER AND WASTEWATER: THE SOUTHERN ARIZONA STORY**

A new approach to analyzing the challenge of sustainable urban growth and water/wastewater development in the rapid-growth arid areas of the Western United States is proposed in this paper. The use of remote sensing imagery over decades combined with an analysis of the regulatory framework for land development and access to water/wastewater connections is critical to a deeper understanding of the reality on the ground.

Urban growth and water and wastewater supply in the arid US Southwest is addressed using, as a case study, the Tucson Metropolitan region of approximately 1 million people. To facilitate the understanding of the problem, this paper presents a brief history of the settlement and development of this area since colonial times to present, including the large development boom after WWII. The paper then discusses this history in the context of land and water regulatory frameworks, which is unique in the arid West and sets the stage for the current challenges on water and wastewater.

This paper highlights the complexity of the urban growth and water interaction. The link between access to water and wastewater infrastructure, land use and the regulatory framework including the role of development patterns, surface and ground water appears as well as unregulated domestic wells.

Further the paper presents a proposed typology of important variables in the understanding of process of urban growth in the semi-arid Southwest. The three major variables are access to water and wastewater systems, land patterns and water regulatory framework. These

variables are combined to describe different configurations in the Tucson metropolitan region and to enable scientists and policy-makers to discuss the sustainability of the developments in each of these categories. Relevant examples (Rita Ranch in east Tucson, Continental Ranch and Dove Mountain in Marana, Rancho Vistoso in the Tortolita Mountains, and the Lower Oro Valley) are discussed.

Finally, a discussion of current and future water resources challenges in the region such as safe yield, Colorado water shortages, droughts and climate change is presented.

It also raises questions and provides insights for future regional and urban planning to address these challenges: i) the need for a holistic approach to the study of water and urban growth; ii) the need for a revision of technical and management systems in a new context; iii) the need for a multi-stakeholders governance model (which would include new water-vulnerable populations) and iv) the need for integrated patterns of urban growth, water and wastewater.

*(4) Kremena Boyanova, Rewati Niraula, Zhao Yang, Francina Dominguez, Hoshin Gupta*

#### **QUANTIFICATION OF WATER-RELATED ECOSYSTEM SERVICES IN THE UPPER SANTA CRUZ WATERSHED, ARIZONA, USA**

The ongoing drought in the US southwest extends the boundaries of the search for solutions of researchers and practitioners. The water-related issues that the state of Arizona is facing on that matter demand re-consideration and re-evaluation of the present management of natural resources.

Focusing on the Upper Santa Cruz watershed, located mainly in southern Arizona and a smaller part in northern Mexico, the research aims to understand the water-related ecosystem services through the analysis of the hydrological cycle within the case study area. For that purpose, outputs from the hydrological model SWAT were used. This provided essential understanding of the impacts of ecosystems' state on the ecosystem services flows to the society. Moreover, possible impacts of climate change and urban growth scenarios can be assessed.

Understanding the hydrological cycle within the Upper Santa Cruz watershed is also important for recognizing the drivers of decisions taken in this area, like groundwater recharge from the Central Arizona Project (CAP), which has been the main water supplier in the area for many years, allocating the water of the Colorado River. A comparison between natural and CAP groundwater recharge provides significant insights into the processes in the watershed – natural as well social. Riparian vegetation, as key service provider in a semi-arid area, is also dependent on the hydrological cycle and is a main indicator of ecosystem health.

(5) *Rositsa Yaneva*

**MAPPING ECOSYSTEM SERVICES SUPPLY AND DEMAND FOR POLICY AND PRACTICE – QUALITATIVE ASSESSMENT IN PANTANO WASH WATERSHED (TUCSON BASIN, AZ)**

Ecosystem services have become an important research and policy tool improving the decision making process and the communication with stakeholders in a wide range of directions. Evaluating ecosystem services' capacity to provide goods and services relative to human demands, will undoubtedly give important information for future strategies and actions in sustainable environmental management. Taking into account the case study natural conditions, the implemented evaluation approach via expert-based assessment allows the realization of a complete investigation about the importance of certain ecosystem services, their supply and demand in temporal and spatial scale.

Linking survey and interview results with land cover/land use datasets and GIS data, ecosystem services supply and demand will be assessed and analyzed in different terms. The resulting maps will on one hand allocate and represent the spatially explicit distribution of the ecosystem services supply and demand in the case study area and on the other, they will identify the supply-demand mismatches and changes over time across landscapes.

Regarding the ecosystem services concept, this research would undoubtedly contribute to the water planning efforts and optimize strategies for sustainable management aiming a balance in between natural capital provision and sustainable policy in a myriad interests. Moreover, it would cooperate the decision making process and resource planning and also give a clear vision about beneficiaries' perceptions for the importance of certain ecosystem goods and services.

(6) *Susan Harris*

**WHERE IS THE SCIENTIST'S PLACE AT THE TABLE?**

Some researchers have questioned whether existing governance structures sufficiently incorporate information gained from scientific research projects. A short presentation will report the result of a series of interviews with state legislators, lobbyists, a mayor of a small town, the dean of the College of Science and leaders of local think tank about the extent to which scientists participate in and the need for scientific research in state water management legislation and local town decisions.

*(7) Kristin Kuhn*

## **WATER REQUIREMENTS OF RIPARIAN VEGETATION IN THE UPPER SANTA CRUZ RIVER**

My proposed research will focus on an analysis of water requirements of riparian vegetation in two river sections of the Upper Santa Cruz influenced by different hydrological conditions. Focus shall be on a section in the Tucson basin defined by rather natural ephemeral flow and an effluent-dependent stream section. Remotely sensed data for the SEBAL-model (Surface Energy Balance Algorithm for Land) will be used to understand the spatial- temporal variations in actual evapotranspiration rates in the riparian ecosystem. Task will be to analyze the correlation of flow patterns and water consumption and to quantify the water requirements of the riparian vegetation. The results can be meaningful for sustainable management of water resources and the preservation of the riparian ecosystem and its services.