No	Session Title	Outline
Coastal Wetland		
1	Effects of Climate Change and Associated Environmental Drivers on Coastal Wetland Services	Coastal wetlands perform a variety of ecosystem services, including flood protection; erosion control; the provision of food and habitat for wildlife, including commercially and recreationally important fish; regulation of water quality; recreation; and carbon sequestration. These ecosystem services have been estimated to be worth billions of dollars globally. Projected increases of temperatures, particularly at high latitudes in the northern hemisphere, will alter the rates of chemical reactions and biogeochemical processes and shift the seasonal cycles of production and consumption of organic matter in ways that may dramatically change these ecosystem services qualitatively and quantitatively. The anticipated direct effects of temperature increases include increases in respiration rates, changes in the solubility of gases, melting of permafrost, shifts in the outcome of competition between species, changes in the rates of chemical reactions, shifts of chemical equilibria, and increases in the duration of the summer growing season. Indirect effects include sea level rise and changes in rainfall and runoff. Some sense of the response of wetlands to these changes may be obtained from controlled experiments in which environmental variables are manipulated one at a time or in combinations, from the characteristics of natural wetlands across the climatic gradient from the tropics to high latitudes, and from examination of the geological record over the course of glacial-interglacial cycles. Predictions about the services provided by coastal wetlands will be confounded by issues related to genetic adaptability and the nonlinearity of interactions related to competition, predation, and regime shifts. Because of the broad range and complexity of the issues that must be considered in projecting the response of coastal wetlands to climate change and associated environmental drivers, it will be essential that this symposium bring together an eclectic mix of coastal wetland researchers who can collectively address and discuss the wide range of biological, ecological, geochemical, and theoretical considerations that must be taken into account to assess the probability of likely scenarios and the impact of those scenarios on the services provided by coastal wetlands. This symposium will be a unique opportunity to bring together a group of scientists who together can address the complex issues that must be considered in assessing the impact of global warming on coastal wetland services and who can convey that assessment to governmental decision makers and agencies such as the Intergovernmental Panel on Climate Change.
2	Coastal Blue Carbon in A Changing Environment	Coastal wetland ecosystems, including mangroves, tidal marshes, and seagrass meadows, sequester significant amounts of “blue carbon,” and play an important role in global and regional carbon and nitrogen cycling. This ecosystem service and the associated value of conservation and restoration in climate mitigation have only recently been recognized by policy-makers, coastal managers, and the society. The ability of coastal wetlands in acting as the net source or sink of major greenhouse gases (GHGs) such as the CO2, CH4, and N2O is affected by climate change, human disturbance, and land uses. The complexity of these processes have limited our capacity in accurately and robustly estimating and predicting wetland GHGs and carbon sequestration at different temporal and spatial scales. The inadequate understanding and tools also hinder the adaptive management of wetland carbon stocks and their incorporation into a potential carbon market. The objective of this symposium is to bring wetland ecologists, hydrologists, biogeochemists, ecosystem modelers, and policy makers together, including both seninor and junior researchers, to present and discuss the status of knowledge, research gaps, emerging new methods and theory, and potential marketing protocols and methodology for understanding, conserving, and restoring coastal wetland carbon in a changing environment.

3	Shifts in Foundation Species Consequences for the Structure and Function Coastal Wetlands	1. Theme: Nearly 70% of the world's population lives within coastal areas. Therefore, climate-driven impacts on coastal wetlands are likely to have substantial implications for human societies. The most rapid 'velocity' of climate-induced change appears to be occurring at the interface of mangrove forests and herbaceous wetlands occurring along the transition from the subtropics to the temperate zone. For example, in China, Spartina alterniflora, which is invading the entire Chinese coast, is displacing mangroves in the upper intertidal of southern China. This pattern contrasts with coastal wetlands at the temperate-tropical ecotone of North America, where S. alterniflora-dominated saltmarshes are being displaced by mangroves. Both mangroves and saltmarshes are among the world's most productive ecosystems, supporting ecologically and economically important communities and providing critical ecosystem goods and services. However, saltmarshes and mangroves differ in key aspects that are likely to have large repercussions for coastal communities and economies. The encroachment of mangrove trees into herbaceous saltmarshes or the encroachment of saltmarsh species into mangrove forests will dramatically alter the structural complexity of coastal wetlands, a key feature believed to alter biodiversity and shoreline erosibility, vitally important functions given that climate change is suspected to alter biodiversity patterns and increase the frequency and intensity of shoreline-eroding severe weather events.2. Objective: The mechanisms behind the encroachment of mangroves into saltmarshes or saltmarshes into mangroves are being studied globally but remain obscure and are thought to involve multiple interacting factors, e.g., global warming, changes in precipitation and land use, increases in nutrient levels and sedimentation. Given that these shifts involve the replacement of one critically important foundation species with a dissimilar, though equally important, foundation species, there are likely to be large though relatively unstudied consequences. Thus, this session will focus on the mechanisms driving the current and future displacement of one foundation species for another along coastlines globally and will examine the implications for coastal management. We will bring together ecologists from around the world to compare and contrast the causes and consequences of mangrove displacement by S. alterniflora that is occurring in China with the mangrove displacement of saltmarshes that is occurring in North America, Australia, and New Zealand. Presentations will highlight a variety of approaches for investigating the mechanisms driving range shifts. We will also explore the ecological interactions and ecosystem consequences resulting from the replacement of coastal wetland foundation species, e.g., changes in community composition, food web dynamics, nutrient cycling, carbon sequestration, interactions with sea level rise and coastal eutrophication, and buffering capacity against shoreline erosion. Understanding the shifting fates of these important coastal wetlands is a significant challenge facing coastal managers today; we hope to highlight current research that improves our understanding of these valuable ecosystems.
Constructed Wetland		
1	Constructed Wetlands for Water and Wastewater Treatment New Findings in Old Technology	Constructed wetlands have been used to treat various types of wastewater for more than five decades. There is considerable amount of results dealing with removal of organics, suspended solids, nitrogen, phosphorus or microbial pollution. However, constructed wetlands have recently been also used to remove endocrine disruptors such as pesticides, pharmaceuticals and personal care products or hormones. Also, research has been aimed at release of greenhouse gases from various types constructed wetlands and sequestration of carbon in these systems. Constructed wetlands have also been used to enhance biodiversity of natural streams and treatment of natural streams. The symposium includes presentations dealing with the latest research carried out across the world. Since 1992 conference in Columbus, Ohio, constructed wetlands have been a topic which has driven a lot of attention among INTECOL WETLANDS conferences participants. We would like to continue in this "tradition".
Deltaic Wetlands		
1	Monitoring and Managing Deltaic Wetlands of Asia	Deltaic wetlands integrate their contributing watershed, while also reflecting the energies and other influences of areas into which they flow (e.g., near-shore lake and estuarine environments). Naturally existing as highly productive areas, natural benefits provided by deltaic wetlands include the provisioning of fish, shellfish, and fibers, as well as pollutant removal through biogeochemical and physical processes, and storm surge protection, amongst other services. However, deltaic wetlands are dependent on their contributing areas for sufficient hydrologic and sediment flows and deposition to maintain the balance between accretion and erosion. Natural and human disturbances to supporting flows can have serious effects on process rates within deltaic wetlands (e.g., carbon mineralization, waterfowl and fishery productivity, etc.) as well as significantly affect the extent of these wetland systems (e.g., the significant loss of the Mississippi delta wetlands in the US). Asia has several internationally recognized and important delta systems, including the Yangtze, Huang He, Mekong, Ganges, Lena, and Selenga Rivers. Contributions to this session focus on the current state and future sustainability of deltaic wetlands of Asia, including research on modeling, mapping, and monitoring.

2	Impacts of Land Reclamation on Mega-Delta Wetland and Its Eco-restoration	Due to rapid socioeconomic development and population growth, China's coastal region relies heavily on land reclamation to meet its explosively increasing demand on land. It is planned that ~6000 km2 of land, most of which from existing coastal wetland, will be reclaimed along the coastline by 2020, causing significant effects on the local and regional ecosystems. In the global backdrop of winding down land reclamation and turning reclaimed land back to wetland and sea, i.e., the managed realignment (retreat), China's new round of land reclamation boom faces enormous challenges to meet the ever-tightened regulation to minimize the adverse environmental and ecological impacts. For the stake-holders and decision-makers, the most critical issues boil down to: Whether to reclaim or not? i.e., can the limited coastal regions accommodate any further reclamation? Where to reclaim? i.e., to identify the area fit or unfit for reclamation; How to reclaim (restore)? To reclaim at minimum environmental and ecological impacts and at the same time, implement effective mitigation and restoration measures on damaged wetland. The primary hot spots under this new wave of land reclamation activities are the mega-deltas, namely, the Yellow River Delta (land reclamation target ~420 km2 by 2020) and the Yangtze River Delta (land reclamation target ~1200 km2 by 2020). Coastal wetlands in the mega-deltas are located in the most intensive interaction zone between land and sea, i.e., the estuaries, which provide crucial ecosystem services such as biodiversity conservation, fisheries, coastline protection, carbon sequestration, water purification, and recreation, etc. However, coastal wetlands have suffered severe loss and degradation in the past decades due to natural (e.g., climate change, sea level rise, etc) and anthropogenic (land reclamation, aquaculture, oil and gas exploration, changing sediment supply, etc) disturbances. To achieve sustainable coastal development in these mega-deltas, the impacts of the intensive land reclamation activities on the impaired coastal wetlands, as well as the mitigation and restoration measures, need to be thoroughly studied. The key scientific issues involved are: the impact of large scale land reclamation on wetland ecohydrological processes; the response and evolution of coastal wetland ecosystem functions under land reclamation; the holistic manipulation of coastal wetland ecosystem in response to land reclamation.How to reconcile the human needs in coastal development and the protection of coastal wetlands has become a question for both scientists and policy makers. This symposium aims to provide a platform for scientists from across the globe who are working on the various disciplines involved, e.g., hydrodynamics, morphodynamics, environmental science, ecology, biogeochemistry, etc., to meet and discuss for potential solutions. Landscape planners and decision makers related to the coastal wetland are also welcome to join.
Floodplain		
1	Floodplain Biodiversity– A Comparison through Continents	In 2006, W. Junk and six other illustrious wetland ecologists published an article after a symposium in which they compared the biodiversity of seven mostly tropical globally important wetlands (peat lands - Canada, Florida Everglades– USA, Pantanal - Brazil, Okavango Delta– Botswana, Sundarban–Bangladesh, Tonle Sap – Cambodia, and Kakadu National Park– Australia). Ten years from now, the results indicated that for most groups of lower plants and animals, data were insufficient for comparative analyses. The only data sets which were rather complete were for vertebrates and higher plants. The comparison showed that high species diversity dominated in all these wetlands due to large habitat diversity, allowing for the coexistence of amphibious species with many immigrants from connected deep-water and terrestrial habitats. All wetlands were already subjected to an increasing degree to human pressure, e.g. by water abstraction, changes in the natural flood regime, land reclamation, pollution, over-utilization of natural resources, and poaching. Although the studied wetlands were in part protected by national and international conventions, major environmental changes in their surroundings were threatening all of them.Ten years after the comparative session we plan a follow-up in order to compare the present state of knowledge and conservation of some big flood-pulsed wetlands of the world. Which were the main questions addressed in the past 10 years? Were the right questions chosen if conservation and sustainable use of the wetlands are the main goal? Which questions should be addressed at present and in future given the actual status of large tropical floodplains?
Forested Wetland		

1	Processes and Transport on Freshwater-Tidal Forested Wetland Interface in the Context of Climate Change and Sea Level Rise	Tidal freshwater wetlands are extensive hydrological and biogeochemical hotspots occurring at the interface between terrestrial and marine systems. Tidal freshwater forested wetlands are riparian forests common along river valleys of the southeastern Atlantic Coast, the Gulf Coast and in Alaska in the U.S., as well as in many other parts of the world. These transitional intertidal and tidal areas are also becoming critical for sustainable management of water yield and storage, flood buffering, filtering and removing pollutants, storm water protection, recreational opportunities, wildlife/aquatic habitat, and other ecosystem services in the face of changing climate and sea level rise. Depending on the magnitude of the riverine and tidal forcing, the stream/river reach can experience unidirectional riverine flow by gravity, tidal backwater conditions, or reversing tidal flows. Within the estuarine zone, adjacent saltwater tidal wetlands are now widely recognized as important zones for carbon processing and sequestration owing to their frequent innundation. In low-gradient portions of coastal plain forested wetlands between the estuarine reaches and the upland watersheds, the presence of tidal effects on freshwater streams and rivers induces a hydrologic driver that is relatively less dependent on precipitation, and its regulation of the hydrological and biogeochemical dynamics has had limited study. The fluxes and associated mass balance of various constituents like sediment, nutrients, and carbon within tidal forested wetlands that interface uplands and estuaries have not been measured. Lack of understanding of spatial and temporal variability of tidal forcing on rivers of differing morphology and flow regime has even hampered mapping the extent of such wetlands. This session will comprise of speakers addressing various processes and transport mechanisms on tidal forested wetlands, including their interactions with tidal fluctuation, vegetation, climate, and sea level rise, besides addressing innovative tools for assessments of these processes, associated impacts, and extent of such wetlands.
High-latitude Wetland		
1	Climate Change Impacts in Siberia, Challenges and Opportunities	Climate change is significantly affecting the Siberian landscape, altering process rates and fluxes of greenhouse gases, as well as causing hydrological and both vegetative and soil structural changes. Recent studies have highlighted: alterations in carbon cycling in peatlands; changing vegetation and pedological structure and integrity with altered climate; modification of small lake stability and permanence; and altered hydrology of large systems, such as Lake Baikal (a UNESCO world heritage site and the location of Ramsar-listed Wetlands of International Importance). The manifestations of Siberian climate change is a global problem, as Siberian peatlands are a significant global carbon storage, as well as critical – and changing – habitat for a number of IUCN, Russian Redbook, and transboundary listed species of concern. This session provides a forum to present advances in wetland science in a changing world, with a particular focus on how climate change is affecting the Siberian wetland landscape, including peatlands, rivers, lakes, and other aquatic systems. We encourage the submission of studies on how climate change is affecting in aquatic system biogeochemical, physical, and hydrological processes at multiple scales, from site-specific studies to regional analyses.
Mangrove		
1	Mangrove Restoration & Mangrove Ecosystem Services	Mangroves play an important role in the tropical-semitropical coastal ecosystem. She has a variety of ecological functions, such as flood control, wave-reduction, storm-prevention and embankment protection. However, due to lack of awareness of mangrove services, some human activities (such as artificial deforestation, land reclamation, reclamation engage in real estate, farming and other activities) have led to the destruction or disappearance of mangrove wetland ecosystems and their habitat. In the last 5 decades, worldwide mangrove area has fallen across all regions. The present annual rate of loss is estimated at just over 1% per year. In China, mangrove also decreased from 46,000 hm2 in 1956 to the current 24578 hm2. Mangrove destruction has led to the loss of coastal ecological balance and the frequent occurrence of natural disasters. The current urgent task is to assess the mangroves ecosystem services, to restore & protect the mangrove resources, and to make he sustainable development of mangroves. We will organize experts from major domestic mangrove research institutes (including Chinese Academy of Forestry, Tsinghua University, Xiamen University, Zhongshan University, South China Sea Institute of Chinese Academy of Sciences, Hainan Normal University) and foreign research institutions (including Australian Institute of Marine Science, Northwest Biological Research Center of Mexico, the United States Wetlands Research Center, University of Miami) to carry out discussion together.
Marsh		

1	Marsh Succession and Its Adaptive Strategies of the Middle and High Latitude Region Under Changing Environment	Marshes are defined as wetlands frequently or continually inundated with water, characterized by emergent soft-stemmed vegetation adapted to saturated soil conditions. These wetlands are typical in China, and concentrated in the middle and high latitudes, and include peatlands. Marshes have an important ecological function, such as flood mitigation, carbon sink, habitat for the wildlife etc. Because of the human alterationand climate change, most marshes were lost and functions were degraded greatly.In China, 60%-80% of marshes were lost in Northeast China, and more than 50% of marshes lost in Tibet Plateau.Loss of marshes has also occurred in US, Russia and other countries. Coastal marshes may be submerged in the waterin the future because of the rise of sea level. It is very urgent to know how the marshes change under the changing environment, regardless of the human activity or nature driving forces. The wetland succession can include the change of vegetation community composition, hydrological process and landscape, also it can be studied in a temporal scale. This symposiu will describe recent changes in marsh structure and function, and measures and techniques to protect and restore degraded marshes by the government.
Non-specified Wetlands		
1	Nutrient Cycling and Ecosystems Services of Wetlands	In a rapidly changing world wetlands are experiencing unprecedented pressure from land use and climate change. These pressures are greatest in developing countries where landscapes are changing at a rapid rate. The symposium will include presenters from developing countries and their international collaborators working in Sub-Saharan Africa, Southeast Asia, and Latin America. The presentations will cover research in a range of wetland ecosystems including coastal wetlands, mountain wetlands, as well as other freshwater inland wetlands. The goal of the symposium is to enhance the participation and engagement by internal wetlands scientists in wetland ecology and management. Currently the level of membership and participation by scientists from developing countries remains low. Yet there is an urgent need to raise the visibility of researchers in these countries as they serve as resident experts on wetland ecology and management. The U. S, Agency for International Development (USAID) through a research program is building technical capacity in these countries with a goal of empowering these scientists to inform policies that safeguard these ecosystems. USAID plans to support the participation of some of the speakers in this symposium. It is anticipated that in addition to this travel support, USAID will also institute an ‘excellence’ award for outstanding wetland research in developing countries. The symposium will also hold a panel discussion at the end of the session on the ‘challenges of conducting and translating wetland science into policy in developing countries’. These discussions will inform how scientific societies can play an important role in raising the profile and status of wetlands globally. Since this symposium will be led by scientists from developing countries, a final list of speakers will only be available once the symposium proposal is selected to move forward.
2	Wetland Ecosystem Resilience and Regime Shift	The session will cover wetland ecosystem resilience and response to disturbance. Although the terms “resilience” and “regime shift” have gained tremendous stock in ecosystem management policy over the past decade, the concept of ‘resilience’ remains vague, varied and difficult to quantify. Furthermore, any regime shift is the net outcome of the interplay of human and natural disturbances, and often, an anthropogenic disturbance or a natural disturbance alone would not force an ecosystem to cross a threshold. Wetlands are complex, adaptive systems characterized by historical dependency, non-linear dynamics, and multiple basins of attraction. Globally, wetlands are among the most sensitive to environmental stochastics such as climate and hydrology. Therefore, wetland ecosystem provides an ideal platform to test, clarify and quantify the concept of ecological resilience. In this session, we will focus on the conceptual frameworks and tools, and case studies. The first session, on Conceptual Frameworks and Tools, will provide a forum to discuss some of the mainstream perceptions regarding how to define, measure, and quantify wetland resilience, including presentations answering questions, such as how much disturbance can an ecosystem absorb before switching to another state? Where is the threshold associated with the switch between ecosystem states? And will ecosystems recover from disturbance without intervention? The second session, on Case Studies, will focus onthe management of wetland resilience in the Yangtze Basin of China, and the Murray Darling Basin, Australia. This session will include both ecologists and wetland specialists and mangers.

3	Building Resiliency to Changing Conditions in Wetland Management and Restoration Projects	The presentations in this symposium will address considerations for building resiliency in wetlands to changing conditions using a variety of management and restoration approaches. The presentations will address this theme at multiple temporal and spatial scales ranging from a comprehensive global overview of wetlands and climate change and an examination of the interaction between climate and wetlands through geologic time, to project and site-specific case studies that focus on the development of resiliency to global changes and stressors. Attendees will be introduced to overarching concepts and principles, paleo-ecological insights into how wetlands have impacted the global climate through time and how the fossil record informs our current understanding of climate and wetland function, as well as site-specific techniques, methods, and approaches for building resiliency through wise management and restoration practice. Speakers will focus on the functional roles of wetlands in providing ecosystem services and how those ecosystem services are best protected, managed, and restored in light of a variety of stressors, such as global climate change, increased water use and demand, reduced water quality, land cover/land use changes, and regulatory changes. Wise use approaches that enhance wetland biodiversity and resiliency to these changes and impacts will be discussed, as will wetland-specific ecosystem services that provide enhanced water quality, water supply, flood protection, storm damage protection, pollution attenuation and climate change resiliency for adjacent human communities. Wetland function in the context of the global carbon cycle today and through geologic time will be a central theme, showcasing opportunities and priorities for protecting existing wetland carbon banks and the identification of conditions that allow for climate change mitigation through carbon sequestration. The history of polar wetlands over the past 100 million years will be examined, drawing on detailed history of the plant fossil record to provide insights into enhancing current day wetland resiliency in the face of modern global climate change. Case studies include wetland restoration projects at the Chaohu Lake in China, wetland and water management techniques utilized in the Upper St. Johns River Basin in Florida, USA, coastal wetland resiliency to climate change in the southeast United States; and assessment of restoration of biogeochemical function across a network of prairie pothole wetlands under varying land uses.

4	Trends in Wetland Condition and Ecosystem Services	The value of long term studies to understand the nature of variability impacting on natural systems, and their response, is now well established. There are now many examples where such studies have revealed the influence of cyclical or directional change and allowed for a clearer interpretation of the diversity of interactions that may occur. They have also clearly demonstrated the limited understanding of change afforded by contemporary monitoring or short term research projects. However, such long term research programs are rare and, where the level of variability is high, or the frequency of cycles long, even these are limited in their capacity to understand change. Increasingly, researchers are seeking to integrate long term ecological understanding with that derived using paleoecological techniques to extend the temporal depth and to retrospectively test models based on contemporary understanding. Similarly, paleoecology is seeking to examine ecosystem change in culturally relevant timeframes at a resolution that can provide useful evidence for ecologists. While long term data sets of wetland ecosystems are scarce, wetlands are the focus of much palaeoecological research. Consequently wetland ecoscience can be well served by the provision of the long term perspective available through the integration of ecology and palaeoecology. Paleoecological records can provide context for the modern condition of a wetland by revealing i. Whether the wetland is presently outside its historical range of condition; ii. Whether it is presently in a stable state or remains in a transient state in response to an historical disturbance; iii. How resilient the wetland is to natural variations in past hydroclimate; iv. The degree to which the wetland has changed due to human impacts relative to the longer term condition. v. The biodiversity lost on account of historical disturbances and the likely cause of that loss; vi. The impact on past and modern disturbances on the capacity of the system to provide ecosystem services now, and in the future. In turn, long term ecological studies provide data to calibrate species-climate-environment interactions that can strengthen reconstructions from evidence archived in wetland sediment sequences. Further, comparison of long term and palaeo-data, over common periods in the past, test the capacity of palaeoecology to reconstruct ecosystems and so allow interpretations to be qualified. The value of the longer term perspective is exemplified through the processes identifying the natural ecological character of wetlands listed under the Ramsar Convention and ongoing assessments of their limits of acceptable change. Increasingly descriptions of wetland ecological character made at the time of listing fail to recognise the degree to which a wetland has already changed from its longer term historical baseline. Further, limits of acceptable change are usually viewed through the prism of short term variations when decadal to multi-decadal, and even century-scale forces of change also prevail. Understanding of long term change to wetlands are increasingly providing the necessary context to better understand the dynamic nature of wetlands to better understand changes in the ecosystem services they provide so as to better guide their wise use into the future.
5	Wetland Carbon Sequestration and Nutrient Accumulation	Wetlands provide important ecosystem services, including their ability to sequester carbon (C) and remove pollutants such as nitrogen (N) and phosphorus (P). They remove N via denitrification and burial (N and P) of plant-derived organic matter in soil. The amounts removed and buried are considerable such that wetlands constructed for wastewater treatment are designed to mimic these processes. Wetland soils sequester C at much higher rates, per unit area, than terrestrial soils so there is much interest in C sequestration, especially in peat-forming wetlands and in estuarine wetlands where accumulation of “blue carbon” occurs without large emissions of methane, a greenhouse gas. A number of studies regarding C sequestration and N and P removal have been conducted in North America and Europe whereas, on other continents, including Asia, and South America, less is known about the contribution of wetlands to C sequestration and pollutant abatement. Studies of how N and P removal and C sequestration vary with local factors, water source (fresh versus saline),landscapeposition (open versus closed)and water depth also are not well understood in these regions of the world.We propose a symposium comparing carbon (C) sequestration and nutrient (nitrogen-N and phosphorus-P removal) by freshwater and estuarine wetlands on four continents, North America, South America, Europe and Asia. Speakers will present research findings describing C pools and sequestration, N and P accumulation in soils and denitrification. Sites include temperate and tropical wetlands, freshwater and estuarine wetlands, open-floodplain and closed-depressional systems and mineral and organic soils. Studiesare synchronized using similar wetland types and analytical (e.g. radiometric, denitrification enzyme activity) methods to allow comparison among sites across the four continents. The symposium will foster collaboration among wetland scientists from different countries and will synthesize comparisons of C sequestration and N and P removal among different wetland types at intercontinental scale.

6	Global Patterns in Wetland Macroinvertebrate Diversity and Distribution	The study of macroinvertebrate assemblages in freshwater wetlands has greatly increased over recent decades. Initially this fauna was studied primarily to determine their importance in the diet of waterfowl. However, an increasing focus on the global loss of wetland habitats and freshwater biodiversity has resulted in an increase in studies investigating patterns in wetland macroinvertebrate richness and community composition. Macroinvertebrates are also being used in bioassessment programs undertaken to determine wetland condition and the success of restoration projects. The aim of this symposium is to bring together researchers working on wetland macroinvertebrates in various climatic zones across multiple continents to investigate over-arching patterns of diversity and distributions. Likely changes in composition and distribution associated with global climate change will also be discussed.
7	Invasive Species in Wetlands	Ecosystem services and biodiversity comprise global resources of unquantifiable value that fulfil the basic requirements of life in terms of food, fodder, fuel, fertilizer and fibre etc. Rapid spread of invasive species beyond their home range is, however, often detrimental to native species and ecosystem functions in the introduced regions, potentially inflicting considerable socio-economic damage. These invasive species pose a serious threat to wetland ecosystems that provide a range of valuable economic goods and irreplaceable ecosystem services for humanity. The wetlands, being resource rich, are highly susceptible to invasion and many wetland plants are characteristically invasive due to their immense potential of rapidly increasing their spatial distribution. Many correlates can be drawn between a suite of socio-economic drivers and environmental conditions influencing the extent of invasion in wetlands. The rivers, which act as important corridors of propagule dispersal, contribute significantly to the spread of invasive species in the wetlands along their course. How the changing river flows, in the context of climate change, are going to influence the extent of invasion in wetlands is still an open question. Growing exotic invasions along with the sweeping waves of global change, growing tourism and expanding urbanization cause biodiversity erosion and biotic homogenization of landscapes in many parts of the world. Despite that, biological invasions are still neither understood well nor given adequate weight in policy and decision making process. In this backdrop, the proposed symposium aims at thoroughly deliberating upon some vital issues pertaining to the biological invasions in wetland ecosystems with special reference to underlying mechanisms, impacts, timely predictions, effective monitoring and efficient management of invasive species. An attempt would be made to deliberate upon as to how we can harness the bioresource potential of invasive species through explicit understanding of the novel biological pathways using emerging technologies. For this a galaxy of following experts will interact with the symposium participants on various topical issues related to the theme of the symposium. The symposium promises to be quite exciting and effective in terms of achieving the objective of an integrated approach towards characterizing invasive species in wetlands and understanding the biology and ecology of worst invasives so as to lay strong foundations for their effective monitoring and management.

8	Denitrification in Wetlands	Great uncertainty remains about nitrogen (N) retention and removal mechanisms in landscape (Pärn, Pinay and Mander 2012). Wetland enhancement and restoration have emerged as best management practices to reduce N contamination of water (Hefting, van den Heuvel and Verhoeven 2013). The most important permanent N removal process is denitrification, the sequential reduction of NO2– and NO3– to the NO, N2O and N2 gases through four enzymic complexes. The final of these, the conversion of N2O to N2, is catalyzed by Nos (nitrous oxide reductase). A large share of denitrifying complexes do not contain the complete denitrification pathway (Jones et al. 2008). Several soil conditions including soil pH, moisture, temperature and inorganic nitrogen compounds, and vegetation affect the soil microbial community, and, hence, denitrification (Weier et al. 1993). There is great interest in the N2O:N ratio, as N2O is a greenhouse gas 298 times the CO2 equivalent. Several soil conditions including soil pH, moisture, temperature and inorganic nitrogen compounds, and vegetation affect the soil microbial community, and, hence, the N2O:N ratio (Weier et al. 1993). Marginal conditions for denitrification produce a higher N2O:N ratio (Van Cleemput 1998). Atmospheric concentration of N2O has increased due to human activity since the pre-industrial era. It exceeded the year 1750 level by 20% in year 2011. Most N2O originates from agricultural land use and is attributed to increased fertiliser application. Wetlands are the source of most terrestrial CH4 (Le Mer and Roger 2001) but act as sinks of N2O (Stocker, Dahe and Plattner 2013). Artificial drainage turns these into sources of N2O (Martikainen et al. 1993). Northern peatlands contain 20–30% of the globe's nitrogen pool (Sjörs, 1981; Gorham, 1991 cit (Martikainen et al. 1993)). Tropical peatlands add a significant amount (Page, Rieley and Banks 2010). This makes the world's peatlands a potentially important N2O source. N2O emission is largely event based – rainfall (Li, Frolking and Frolking 1992), soil moisture, pH (Goodroad and Keeney 1984), freeze-thaw (Koponen and Martikainen 2004), fertilisation, root activity (Christensen 1983) and ebullition (Clough, Sherlock and Rolston 2005) to name a few of the involved phenomena. Therefore, natural variation in the gas emissions is very high regardless of sample size (Pärn et al. 2015).The objective of the Denitrification in Wetlands symposium will be to provide a current insight on the state of the art of and theoretical solutions for the complex denitrification research done in wetlands of the globe.
9	Advances in Remote Sensing Technology to Characterize Wetland Systems	Existing at the land-water interface, wetland systems are amongst the most sensitive to anthropogenic and natural stressors, especially those that affect the quality, quantity, and timing of waters which sustain these complex systems. Due to spatial heterogeneity, high macrophyte diversity, and varied hydropatterns, wetlands are also difficult to accurately characterize through remotely sensed means. Improved sensor resolution and the availability of additional spectral bands and sensing technologies provide opportunities to characterize wetlands and provide baseline data to assist resource managers in sustainable system management. This session focuses on advances in remote sensing technologies and applications to characterize wetland systems. Presentations of new research advancing our ability to monitor, map, and manage wetlands from across the world, as well as to understand the anthropogenic and natural impacts on wetland systems, including the use of new sensors, analytical methods, and case studies are encouraged.
10	Classifying, Measuring, and Assessing the Effects of Wetland Connectivity in the Landscape	Individual ecosystems are not closed, isolated systems, but depend on material and energy imports from neighboring systems. Ecosystems also affect other systems through material and energy exports. Connectivity describes the degree to which components of a system, such as a watershed, are joined, or connected, by various transport mechanisms. Connectivity encompasses hydrological, chemical, and biological fluxes between systems. Connectivity is determined by the characteristics of both the physical landscape and the biota of the specific system. Wetland connectivity within the landscape has become an increasingly important scientific topic because of the need to understand how fluxes of energy and materials between wetlands and other aquatic systems affect ecosystem services. This is especially true for geographically isolated wetlands (GIWs), which normally lack surface-water connections to other waters. However, GIWs can be connected to other systems through groundwater and biological flows and through intermittent or ephemeral surface-water connections. The issue of GIW connectivity to downstream waters has attracted considerable regulatory attention in the United States, due to a US Supreme Court case requiring a "significant nexus" between certain wetlands and downstream waters for such wetlands to be regulated under the Clean Water Act. The issue of wetland connectivity will become increasingly important with continued international efforts to protect and restore wetland resources. This symposium explores the issue of wetland connectivity, and examines new ways to classify, measure, and assess the hydrological and ecological effects of wetland connectivity in the landscape.

11	Lake and Wetland Modelling for Global Assessment and Sustainable Management	While the world's wetlands (including lakes and deltas) exhibit a great biodiversity and provide important ecosystem services to humanity, wetlands are still disappearing at an alarming pace. Moreover, the quality of many of the remaining wetlands is declining, due to a range of anthropogenic activities like land-use changes (direct and in catchments), hydrological changes (due to water extraction and climate change) and overexploitation. Some of these pressures are 'truly' global in nature (such as climate change), others (such as land-use changes and hydrological projects) act on local or catchment scales but are so widespread that their effects are globally significant. These processes continue to threaten the size, the biodiversity and the functions of the world's wetlands, despite important achievements made by international conventions. Proper assessment of the future of the extent, quality and functions of wetlands requires model studies integrating these different aspects from catchment to global level. Model studies can also support the exploration of options for sustainable management and formulation of "wise use" policies as advocated by the Ramsar Convention.This session aims at discussing the recent international achievements in lake and freshwater wetland ecological modelling and puts these achievements in a global context. Both global models as well as 'generic' models that have the potential of a global application will be discussed. The focus will be on ecological models, integrating hydrological, carbon, nutrient and biotic processes, without specifically addressing either of these separately. Topics include hydrological, water quality, climate and biodiversity aspects, linked to ecosystem functions and services (e.g. water for irrigation, fisheries, good drinking water quality and natural resources). Models on (internal) wetlands processes will be placed in a spatial context, i.e. linked to catchment or global hydrological and land-use models. Studies will be on wetlands, lakes and deltas within different climate zones, to cover differences in drivers, impacts and functions among climate zones. The session will thus contribute to the central theme of the Conference "Wetlands as hotspots of biodiversity and ecosystem services". The session will present types and examples of models that can give insight in the relations between the pressures on and the functioning of freshwater wetlands around the world, and define differences in sensitivity and key processes among world regions, and hence may play a role in the prioritization of policy options.
Peatland		
1	Mechanism Controlling Carbon Sequestration and GHG losses in Peatlands An Arctic to Tropical Comparison	Peatlands cover only about 2–3% of the Earth's land surface but store around 25% of the world's soil carbon. Sequestration of soil carbon (C) in peatlands arises primarily from the imbalance between inputs by primary productivity and losses mediated by microbial decomposition, both to the atmosphere and as dissolved organic carbon (DOC) exports (Clymo, Turunen et al. 1998, Richardson 2008). Projected shifts in climate may affect both the distribution of peatlands (Gallego-Sala and Prentice 2012) and underlying biogeochemical processes, with rapid responses by soil microbial communities suggesting potential for climate feedback processes mediated by the metabolism of soil microbes (Bardgett, Freeman et al. 2008; Hartman, Richardson et al. 2008). Resolution of the direction and magnitude of these feedbacks will require mechanistic understanding of both microbial metabolic processes and their interactions with environmental constraints and perturbations (Singh, Bardgett et al. 2010). Considerable progress has been made in delineating the environmental metabolism of narrow functional groups in peatlands, particularly methanogens and microbes of northern peatlands (Juottonen, Galand et al. 2005; Jaatinen, Laiho et al. 2008; Yavitt, Yashiro et al. 2011; Troxler, Ikenaga et al. 2012; Serkebaeva, Kim et al. 2013, Ye, Bohannan et al. 2012, 2014). However, the functional groups relevant to the decomposition of complex soil carbon substrates are poorly characterized (Singh, Bardgett et al. 2010), as are variations in the chemical structure of carbon peat complexes, and thus biogeochemical mechanisms controlling decomposition processes along latitudinal gradients are unknown. Nevertheless, markedly different microbial communities are found among peatland types (Andersen, Chapman et al. 2013), and alteration of phenolic content has been hypothesized to be a prime control over carbon dynamics in some peatlands (Wang, Richardson et al 2015), and alteration of phenolic content has been shown to influence soil microbial community structure and function (Winder, Lamarche et al. 2013; Rasche, Musyoki et al. 2014). We will explore the extent to which lower latitude peatlands provide a useful surrogate for climate change effects on more northern peatlands. The objective of our Carbon symposium will be to provide current insights into C chemistry and compare the mechanisms controlling C storage and gaseous releases of C on peatlands along a gradient from Arctic to Tropical Wetlands.
Urban Wetland		

1	Using Wetland “Turquoise” Infrastructure to Design More Sustainable Cities	Green and blue infrastructure are familiar features of cities and are familiar concepts for ecologists. These two terms, and color designations, delineate services provided by terrestrial versus aquatic urban ecological features and ecosystems. But these two infrastructure designations may not accurately represent the services provided by urban wetlands, which are an important component of “natural” infrastructure in virtually all cities. Wetlands are found where terrestrial and aquatic ecosystems meet, and they have ecological functions and structures that are both terrestrial and aquatic in character. As such, urban wetlands are both green and blue infrastructure. When one combines green and blue, the result is the color turquoise. Urban wetlands are unique enough in the urban matrix to warrant the term “turquoise infrastructure”. While some urban wetlands are found in, or have been rehabilitated to be in, somewhat natural states, much of this “turquoise infrastructure” was designed and constructed to provide specific services. These services include wastewater treatment, stormwater management, recreation and aesthetics, and habitat. Cities around the world face challenges that make more sustainable urban futures elusive. Novel solutions and transformative change are needed today if our cities are to have any hope of more sustainable and resilient futures. Most of the environmental impacts of any project are manifest at the point of design, suggesting that this is where a real difference in urban development can be made. Increasingly, urban designers and planners are recognizing the value and resilience of ecological systems, including wetlands, and are incorporating ecological structure and function into urban design and development. This process is greatly enhanced when urban ecologists, designers, and planners work together, and this interdisciplinary, even transdisciplinary design-ecology nexus provides real opportunities for urban wetland ecologists to move their knowledge to action. In this Invited Symposium we highlight examples of how urban wetlands are being designed and used to make cities more sustainable, with a particular focus on comparing and contrasting how this is happening in China and the U.S. At the end of the six invited presentations the co-conveners will lead a brief discussion about similarities and differences in the way urban wetlands are designed and used in Chinese and U.S. cities and the “lessons learned” from each.
2	Treatment Wetlands in Urban Settings	Treatment wetlands improve water quality through suspension of solids, microbially mediated pathways, and other processes that transform and remove pollutants. In urban environments, treatment wetlands frequently also provide ecosystem services, creating an environment that provides cost-effective improvements to water quality as well as supporting wildlife habitat. However, processes within urban treatment wetlands can be deleteriously affected by constituents within the inflows, such that functions in urban wetland systems are decreased by the magnitude, duration, and intensity of the very pollutants they are constructed to mitigate. In addition, treatment wetlands in urban environments are frequently constrained by space and size limitations, as well as aesthetic considerations, all of which can compromise their efficacy. Nevertheless, locating treatment wetlands in urban environments provides improved water quality and ecosystem services at the source of many pollutants (including industrial wastes, storm water runoff, and organic wastes). From a regional perspective, improvements in urban treatment wetlands decreases pollutant loading on river systems that, in turn, can decrease the operational expense and concerns associated with drinking water intakes on downstream urban areas. Treatment wetlands in urban areas throughout the world thus provide for safe and sustained drinking water quality and quantity. This session highlights advances in treatment technologies and ecosystem services associated with treatment wetlands, focusing on those in urban settings. Presentations on urban treatment wetlands, including case studies, micro- and meso-scale research, and large-scale implementation are encouraged.

3	Wetlands as Green Infrastructure Across Multiple Spatial Scales	Green Infrastructure (GI) is rapidly developing popularity as a cost‐effective approach toward managing water resources and infrastructure – and one that also fosters sustainable communities and ecological benefits. GI methods use soil, vegetation, and natural (i.e., not constructed) landscape processes for beneficial effects on water quantity and quality. These practices can be implemented and potentially effective at multiple spatial scales, including plots, cities, sewersheds, and watersheds. Natural, semi‐natural, and built wetlands are vital green infrastructure (GI) components across these spatial scales, providing important contributions to ecosystem services (e.g., flood attenuation, water pollutant retention and transformation) that are central to the health and well‐being of aquatic systems and communities. Wetlands are incorporated into GI practices, for example, to treat wastewater primarily for excess nitrogen management, with ancillary treatment benefits affecting phosphorus and other co‐pollutants. Natural and semi‐natural wetlands (including floodplainwetlands) can be integrated into watershed and sewershed GI practices to passively manage stormwater and wastewater discharge. By decoupling stormwater flows, wetlands can promote the maintenance of critical stream and floodplain habitat, while concurrently providing sufficient retention time for important biogeochemical functions (e.g., denitrification). The use of wetlands in GI practices can also benefit the wetlands, for example, by enhancing their rates of productivity and thereby reducing the risk of subsidence in response to sea level rise in coastal systems. However, while wetlands are key resources in GI‐based sewershed and watershed planning, discussions, collaborations, and insights on results regarding their use for GI implementation are needed.This symposium focuses on research and results of efforts that assess the impacts of wetlands on wastewater and stormwater management and how the use of wetlands in GI implementation will help guide future decisions on how to incorporate GI into urban planning. The symposium will provide a forum for discussions on best practices for use of natural, semi‐constructed, and constructed wetlands in GI and whole‐system planning.Contributions to this session will include case studies and cross‐site examples of monitoring, modeling, data analyses, and management approaches that describe the effects of implementation and placement of wetlands as GI at multiple spatial scales, including city parcels, sewersheds, landscapes, and watersheds.
Wetlands in Drylands		
1	Wetlands in Drylands, Enigmatic but Neglected Ecosystems Valuable for Human Wellbeing	Many of the world’s extensive drylands host permanent and temporary wetlands, despite being in climatically variable and moisture stressed environments. Humans living in dryland environments therefore rely on these systems for a range of ecosystem services, particularly during the dry season when water availability is scarce elsewhere in the landscape. However, land use change and population growth threaten the functioning of these ecosystems in ways that cannot be predicted based on our current understanding, because wetlands in drylands have received surprisingly little attention globally. It is also not possible to extrapolate from wetlands in moist northern temperate settings, because wetlands in drylands have emergent properties that cannot easily be predicted.
Wetland Parks and Nature Reserve		
1	Wetland Nature Reserve Integrated Local Government for Ecological Civilization	Although wetland ecosystem services of wetland nature reserves is closely related with human’s production and living, favorable coordination mechanism not yet formed due to complexity and multi-departments involved in wetland conservation and wise use. especially in land classification in China, some areas and departments treat wetland as "unused land", that lead to over exploitation resulting in wetland area yearly decreasing and wetland function continuous degradation. Within the nature reserve protection system in China, wetland reserves, no matter high or low in protection level, are put under local government administration. With most managers of wetland reserves nominated by local government, and under the direct leadership of the local party committee and government this results in their dilemma between strict national nature reserve regulation and urgent economic development depending on wetland resources pushed by local government. Hengshui Lake National Nature Reserve has a 15-year history since the provincial nature reserve established in 2000. Managers paid continuous efforts and made great achievements in terms of wetland conservation, especially for the construction of ecological civilization which is consistent with the local government's target. China has a large number of wetland nature reserves. If each reserve can find integration points with local government economic development from the main line of ecological civilization construction, our country's wetland conservation will get significant achievements

2	Wetland Parks - Key Lessons for the Sensitive Integration of People, Wetlands and Wildlife	Wetland nature tourism is often viewed as a mechanism to help conserve wetland habitats and species whilst providing both direct and indirect inputs into the local economy. Europe and North America have a long history of creating visitor facilities within wetland areas that provide access for wildlife enthusiasts and locations for environmental education. The more recent development of Wetland Parks in China have, in some cases, become significant tourist attractions catering for 100,000s of visitors annually. The development of wetland parks and visitor centers can be used to raise awareness of the importance of wetlands and their species through both formal and informal learning programmes whilst also attracting funding for habitat enhancement, restoration or creation projects. When designed and managed appropriately, wetland visitor attractions can sensitively integrate visitors with the conservation of the wildlife and habitats they come to see as well as with the people who live and work within the wetlands. However, when the design and management of visitor facilities and habitats does not integrate successfully with nature due to poor facility design, inappropriate public access increasing disturbance to wildlife, disruption to local people's livelihoods, poor interpretation and unsuitable habitat management, this can result in negative impacts and, at the very least, a missed opportunity. This symposium will examine best practice and lessons learnt from a series of case studies around the world to identify the key recommendations for how visitor facilities and habitat management projects can be integrated with sensitive wetland species and wetland dependent local communities to avoid negative effects and maximise the benefits to wildlife, people and local economies. Building on recent guidance from Ramsar regarding best practice for Wetland Education Centres, it will highlight the most appropriate methods and techniques for consultation, planning, design and construction and consider different funding approaches and opportunities to achieve a successful outcome.
Special Session		
1	National Wetland Park Construction and Management	
2	Wetland Restoration in China	
3	Ecological Restoration and Wetland Conservation Technology	
4	Amazon and Pantanal biodiversity and ecosystem services under regional and global changes	The Amazon and the Pantanal are large tropical wetlands, home to a unique richness and abundance of species, featuring a mega-diversity. On these two wetlands, characterized by annual and multiannual flood pulsesof high and low amplitude, groups of plants such as palm trees and aquatic weeds, and animals such as fish and birds,stand out in the landscape and in human interactions.The ecological functions assigned to these wetlands and translated on the Millennium Ecosystem Assessment as regulatory, provision, production and information services are threatened by local and global environmental changes.These wetlands are located in the ecological transition region between large morpho-climatic domains, divisors of large watersheds and ecotones between the Amazon, the Cerrado and the Pantanal Wetland, forming extensive ecological corridors. This region has great incidence on public policies and initiatives.Such policies and initiatives, past and present, associated with energy production, such as large and small hydropower and food production for exportation, such as soybean and meat, act as a driver that threatens the biological integrity of ecosystems and their services. The effect of these policies is increased byclimatic changes already registered in the region, such as rain deficit and temporal displacementduring the rainy season.Such forces have caused social and environmental impacts on biodiversity of biological groups, which attribute the status of hotspots to these wetlands and their ecosystem services, in a region with large gaps of knowledge and lack of protected areas.In this context, the symposium aims to present research results focused on these wetland groups of aquatic birds, fish, palm trees and ecosystem services in a scenario of pressure, caused by deforestation, fires, hydroelectric power plants, food production, waterways and climate change.These pressures accentuate environmental risks, changing the ecological functions and ecosystem services of the wetland, increasing vulnerability and affecting the ecological resilience.

5	Wetland Wise Use in South Asia: Emerging Pathways and Challenges	Wise use is globally recognized as the central tenet of wetland management. Adopted as a guiding principle over forty years ago by the Contracting Parties of Ramsar Convention, wise use is one of the longest established examples amongst intergovernmental processes of ecosystem approaches for conservation and sustainable development of natural resources. By recognizing that stemming wetland loss and degradation requires incorporation of linkages between people and wetlands in an era wherein protected area based approaches were in vogue, and emphasizing that human use of these ecosystems on sustainable basis is compatible with conservation, the thinking of the Convention progenitors was indeed futuristic. In the last over four decades, a suite of guidance on various elements of wise use (as ecological character, integration of wetlands in river basin management and others) has been adopted by the Convention's Contracting Parties so as to support practical delivery of wise use. The definition of wise use itself has evolved over a period of time to keep up with the current thinking, most recent being incorporation of ecosystem services within the approach's ambit. At the same time, by shying away from describing a full-some set of coherent principles, it is often left to manager's judgement on what qualifies as wise use and what does not. Recent evidences of natural wetlands loss in South Asia indicate that striking a balance between wetland functioning and human use is indeed going to be challenge. Wetlands are being rapidly modified to meet water, food and energy security needs of burgeoning population, leading to, often irreversible changes in ecological character status, mostly for enhancing provisioning services at the expense of regulating and cultural services. Public good character of ecosystem services, which means that the society overall is better off if these services are maintained, even if there are limited numbers of people who privately and exclusively benefit from them, makes management complex. The heterogeneity of power structures, unequal social positions and differential strengths in political bargaining processes often prevent rationalized decision making leading to marginalization and creation of imposed choices. The call on wetland managers in delivering wise use goals is increasingly complex, and challenging in an era of sectoral policy and decision making. The session, by calling on thematic presentations and case studies from Asia region, intends to explore the pathways adopted by South Asian wetland managers in securing wetland functioning in an environment of increasing food, water, energy and climate security. The workshop will contribute to the deriving lessons for the wetland managers in mainstreaming wetlands in wider developmental programming.
Workshop		
1	Elements should be considered for Planning Sustainable Natural System of Wetlands	Natural treatment systems, particularly the constructed wetland systems, because they are easy to design, build, and operation, have been the preferring system for wastewater treatment within agencies or designers of governments, societies and academics in many countries. For example, in the past few years, constructed wetlands have been widely planned and used in Asian countries, in Thailand, Taiwan, Philippines, and China. From the experiences of our involvements in design and operating the constructed wetland system, we found that most of these projects designed for pollution control and water treatability did show their useful capability in the first few years. Nevertheless,some of them were gradually unable to perform at the designed standard after some period of operation and in some cases;these natural technology applications were regretfully abandoned. Why this happened? Do the theory and design procedures for constructed wetlands not being documented enough? No, we found that most of researchers, engineers, and governmental agencies were too focus on the treatability (facilities) of technologies, instead of considering a long-term operations and maintenances (O&M). Furthermore, some other elements, such as in-sufficient financial support, people's wiliness of participation can also be the elements of the improperly performance of the system. In this workshop with 13 papers from different regions of China and Taiwan, we would like to explore and examine some elements that are recognized to be important in achieving the sustainability of constructed wetland for water treatment based on their practical function of the last few years. We hope this workshop would gather more other elements that should help in building up an economical and sustainable constructed wetland or near natural water treatment system.
2	The Waterharmonica, over 20 years experience with Reuse of waste water through natural processes	

3	Tomorrow-wetland: Exploring wetland futures through scenario development	
4	Linking Scales and Processes for successful Integrated Water & Land Management: Ecohydrology	The objective of the workshop is that the enormous potential of ecohydrology is not yet realized because most scientists have approached it solely at the scale of their research; few have had or been able to express, the multi-scale vision of its applicability as a tool for sustainable management. Moreover, even fewer scientists have been able to take the applicability of their science to decision-makers. On the other hand there are positive practical examples of successful restoration of degraded dry landscape which need scientific explanation. Thus, ecohydrology has spent two decades being developed by scientists as a new, multi-dimensional paradigm, the outputs of which are clearly visible in the scientific literature but have not yet been effectively utilized by Society. The proposers see the workshop as the first step in integrating scale and processes in order to provide a seamless, coherent tool for sustainable, scientific water management.
5	Tools and strategies to understand and co-create actions in Amazonian and Pantanal wetlands under pressure	One of the main challenges for the management and conservation of large tropical wetlands is to investigate and implement tools and strategies that envisage the future of these ecosystems. The biodiversity and ecosystem services provided by the large wetlands of the Pantanal and the Amazon, in the Guapore, Tapajos and Low Amazon rivers, may be reconsidered in light of new tools and management strategies in order to allow lead management processes respecting the functions and the carrying capacity of these ecosystems. These wetlands are located in areas of geopolitical, hydrological, biological, economic, agricultural and cultural frontiers. In this space, large incidences of public policies and private initiatives take place, such as the great hydro power plant, which bring about changes in the landscape of wetlands. In addition, they cause impacts on the functioning and change of ecosystem services and in the territories of indigenous peoples and traditional communities, breaking their ecological and cultural interactions. In this scenario,the region's existing weaknesses emerge: the regional asymmetries, characterized by low educational indicators, such as the low number of qualified human resources for research and graduate courses, the creation of protected areas, insufficient in size and number for the maintenance of biodiversity and the ecosystem services as well as the management of failure, social inequality, threats to rights acquired by indigenous peoples and traditional populations. In response to these contradictions and conflicts, cooperation networks emerge as institutional and social empowerment strategies. In this perspective, research, post-graduate and action networks, such as the network of biodiversity and Biotechnology of the Amazon, Pantanal, climate network and the Amazon network of dams contribute to the advancement of knowledge and strategic actions in strengthening ecological and cultural resilience of wetlands. This symposium aims to discuss the action strategies and tools that face the challenges for the conservation and building of dialogues that promote participation in a changing environment, uncertainties and adaptations to these new frameworks in the tropical wetland.
6	Mercury in biota of main tropical freshwater systems in the Amazon	Over more than three decades of studies and research in the Amazon, including the Amazon basin, Guapor é and Paraguay, the understanding of the gold mining contribution is designed secondary to the natural source of mercury in soils. Studies show occurring on an annual time scale of release of mercury into the environment through point and diffuse sources, and metal emissions through deforestation growth, evolution of fires and the expansion of dams for hydropower and SHP. Added to this, the Amazon and the Pantanal have naturally favorable environments for the methylation of inorganic Hg for organic form, which may explain the high and moderate concentrations in carnivorous fish devoid of gold mining environments. Recent studies indicate a new panorama for methylation in aquatic environments of tropical areas, periphyton associated with macrophyte rhizome is put as a major methylation pathways of Hg and availability in aquatic food webs. New paradigms point to the active participation of methanogenic bacteria in MeHg formation process in tropical areas, from natural Hg deposited in water and / or sediment.
7	Comparison Study of Wetland Restoration Methods and Techniques between China and Other Countries: Implications to Wetland Restoration and Management of China	Wetlands have important ecosystem functions, but because of the irrational human activities and climate change, most wetlands were lost and functions were degraded greatly, especially in China 60%-80% of marshes were lost in Northeast China, and more than 50% of marshes lost in Tibet Plateau, this loss of marshes also happened in US, Russia and other countries, so it is very urgent to restore the wetlands. Now the government of China paid more attention to wetland restoration, but restoration techniques and methods, restoration criteria and system are not enough to meet the request of government. By this workshop some successful restoration experiences can be shared, it will be beneficial to the wetland restoration and management, maybe not only for China, but also for other counties.

8	Ecosystem Based Adaptation approach for Sustainable Management and Governance of Coastal/ Marine Wetlands Ecosystems	The session is designed for academics, managers and representatives of the institutions engaged in wetlands research, young professionals, engaged in investigating Ecosystems based adaptation and wetlands management frameworks with an aim to initiate adialogue on Ecosystem-based Adaptation and the goal is to make sure EbA is integrated with wetland management and planning processes e.g. included the relevance of other ecosystem services and as part of the SGDs goals and target implementation. The proposed panel discussion with also open dialogue on the capacity needs and gaps on how to incorporate the different ecosystem values into post-2015development plans at global, regional and local level especially that relate to wetland ecosystems management. We would also open discussionon 'partnership-based approach' that builds knowledge, supports action on the ground and enhances governance and policy processes in support of building resilience of wetland ecosystemsagainst global change, including climate change in line with SDG (Goal17: Strengthen the means of implementation and revitalize the global partnership for sustainable development).The outcomes of this proposed session will be to identify ways to: i) create a consensus among participating stakeholders to conserve and managewetlands habitats by employing ecosystems based approach and discuss ways to reduce the risks to wetland communities by investing in capacity development. Furthermore to initiate an open dialogue partners/stakeholder (including private sector) to create a 'common understanding' by aligning the capacity initiatives that encourages the application of sustainable practices and novel ecosystem management techniques as nations, and communities prepare to apply scientific tools for evidence based managements frameworks to support objectives underlined in SDG targetsand to then identify barriers and opportunities while applying these techniques mostly in terms of data, information and knowledge gaps. The outcomes of the knowledge café will be translated into a 'position paper' and submitted to Intergovernmental science-policy Platform on Biodiversity and Ecosystem Services (IPBES) to feed their the central target of strengthening the science-policy interface for biodiversity and ecosystem services for the conservation and sustainable use of biodiversity, long-term human well-being and sustainable development. Participating members in the knowledge caf ésession who are also linked with IBPES tasks and activities on capacity building will a take leadership in establishing that connection.The additional objective of this session is to identify stakeholders who intend to jointly develop a long term 'capacity development' [practical and technical capacity for integrated wetlands ecosystems management] and discuss mechanisms to have the knowledge available as open access for any stakeholder to use freely to improve decision making capacity, also to periodically use this resource base in programs in which stakeholders would be formally enrolled (open courseware training modules) and mentoring. UNU-INWEH will present its experience in capacity development of marine and coastal ecosystems while emphasizing on the need to underline a common agenda for joint action.Each panellist will reflect on the lessons learned from the work conducted relative to their own involvements, what they comprehend as barriers and opportunities, and what the next steps are to move this post-2015 development agenda forward aligning with the larger commitments associated with capacity development forwater and ecosystems management.
9	River Health, Water Ecological Function Regionalization and Ecological Restoration	
10	The Next Generation of Wetland Science: Ecosystems, Applications, and Engineering	
11	Wetland Park Alliance	
12	Environmental flows and wetlands water requirements	Environmental flows has been recognised as the "master variable" that defines the river ecosystems and drives the change of biodiversity in rivers, lakes and wetlands. In 2007, a widely agreed definition on environmental flows was reached atthe Brisbane International River Symposium; in the same year, the Ramsar Handbook 8 (Water allocation and management, 2007) highlighted the importance of flow management to wetlands. Today, environmental flows requirements have been incorporated into national legislations in more than 40 countries, implemented in many rivers;and environmental flows are discussed for being included into the water-related indicators for Sustainable Development Goals.

13	Wetland Ecosystem Water Demands	
14	The Conservation and Wise Use of Wetlands in North-east Asia with focus on the coastal wetlands of the Yellow Sea	The workshop will hear updates from the three countries in Northeast Asia that border the Yellow Sea, i.e. the PR China, DPR Korea and RO Korea, about the steps that that have, or plan to take to conserve the unique wetlands in their countries, particularly the coastal wetlands around the Yellow Sea. The PR China and RO Korea are currently both Contracting Parties to the Convention on Wetlands, while the DPR Korea has expressed itsinterest to accede to the Convention in the near future.It has been estimated that there are more than 1 million ha of intertidal habitats around the Yellow Sea, including the Bohai Sea that provides ecosystem services with a value of at least US$30 billion per year (MacKinnon et al. 2012). This includes their value for marine products, water purification, recreation and disaster prevention. However, these intertidal habitats are being lost at an unprecedented rate, mainly due to reclamation for agriculture, aquaculture and industrial development. Murray et al (2014) calculated that some 65% of these tidal habitats have been lost over the past five decades and thatof the tidal habitats that existed in the 1980, 28% had disappeared by the late 2000s.These intertidal habitats are vital stopping over sites for many waterbirds that migrate between their breeding grounds in the Russian Far East and Alaska, and their non-breeding grounds as far south as Australia. The loss of the intertidal habitats has caused the population of some of these waterbird to decline dramatically, such as the Curlew sandpiper and Eastern curlew whose populations have each crashed by about 70% over the past 20 years.Organizations such as BirdLife International, the East Asian-Australasian Flyway Partnership, Hanns Seidel Foundation, IUCN, the Secretariat of the Ramsar Convention, UNEP and WWF are supporting the organization of this workshop.
15	Conservation and sustainable management of alpine and subalpine (highland) wetlands	Many wetlands in China are found in alpine and subalpine areas and face with increasing natural and anthropogenic threats. On one hand, these wetlands are affected by various impacts of climate change, as temperature increasing rate is higher than the national and world average and the precipitation pattern is also different from other regions of China and the rest of the world. It is not well understood the present situation of and trend of future change in highland wetlands. On the other hand, some of these wetlands became important tourist destinations and they have been facing pressures of increasing anthropogenic impacts in the past two decades. While tourism development has brought about tremendous economic impacts on these wetland regions, it has also caused considerably ecological and environmental changes, in most cases, negative impacts. The combined natural and anthropogenic impacts on highland wetlands are complicated and have been poorly understood. This session hopes to provide a platform for researchers, practitioners to share their knowledge in research, practice and management of highland wetlands. Topics may include the following: •Natural impacts on highland wetland conservation •Anthropogenic impacts of highland wetland conservation •Challenges in sustainable management of highland wetlands

16	Biological invasions in aquatic plants	The workshop will hear updates from the three countries in Northeast Asia that border the Yellow Sea, i.e. the PR China, DPR Korea and RO Korea, about the steps that that have, or plan to take to conserve the unique wetlands in their countries, particularly the coastal wetlands around the Yellow Sea. The PR China and RO Korea are currently both Contracting Parties to the Convention on Wetlands, while the DPR Korea has expressed itsinterest to accede to the Convention in the near future. It has been estimated that there are more than 1 million ha of intertidal habitats around the Yellow Sea, including the Bohai Sea that provides ecosystem services with a value of at least US$30 billion per year (MacKinnon et al. 2012). This includes their value for marine products, water purification, recreation and disaster prevention. However, these intertidal habitats are being lost at an unprecedented rate, mainly due to reclamation for agriculture, aquaculture and industrial development. Murray et al (2014) calculated that some 65% of these tidal habitats have been lost over the past five decades and thatof the tidal habitats that existed in the 1980, 28% had disappeared by the late 2000s. These intertidal habitats are vital stopping over sites for many waterbirdsthat migrate between their breeding grounds in the Russian Far East and Alaska, and their non-breeding grounds as far south as Australia. The loss of the intertidal habitats has caused the population of some of these waterbird to decline dramatically, such as the Curlew sandpiper and Eastern curlew whose populations have each crashed by about 70% over the past 20 years. Organizations such as BirdLife International, the East Asian-Australasian Flyway Partnership, Hanns Seidel Foundation, IUCN, the Secretariat of the Ramsar Convention, UNEP and WWF are supporting the organization of this workshop.
17	Wetland protection and sustainable development of economy and society in Jiangsu province	
18	Developing a Systematic Classification of the World’s Wetlands	Many individuals and countries have developed wetland classifications for their own purposes, and others are developing systems to suit their own needs. There have been some attempts to develop classifications with global application, including those based on landform, water regimes and vegetation features, and variously with overlays of water quality, including salinity, and as habitat for particular taxa, such as waterbirds. Difficulties have arisen given the wide variety of wetland types, and differences in the definition of what constitutes a wetland. An appraisal of wetland inventory and classification was undertaken at the 4th INTECOL Wetland Conference in Columbus, USA, in 1992. Given renewed interest in assessing the importance of wetlands, such as through the UN Sustainable Development Goals agreed in 2015, we are seeking an update and reappraisal of wetland classification in order to provide a basis for systematic comparisons between wetlands. This in itself is not implying that a single global classification is achievable or desirable, given vast differences in the purposes of classification and the range of wetland types within any region or jurisdiction. We will use case studies to address some fundamental questions about classification, including: what are the main data needs and purposes for classification; what techniques are being used to collect these data; and what are the common features that could comprise a systematic global classification or classifications?
19	Assessing the state of the World’s wetlands	The purpose of this workshop is to initiate an updated global assessment of wetland biodiversity and ecosystem services a decade after the Millennium Ecosystem Assessment reported in 2005 on the status and trends, scenarios (possible futures) and policy responses. This will contribute to the reporting on the Convention on Biological Diversity ֹs Aichi Targets for Biodiversity and the development of a Global Wetland Observing System and the Ramsar Convention ֹs on Wetland ֹs State of the World ֹs Wetlands Report. Despite the many wetland initiatives since 2005 and further resolutions taken by the Ramsar Convention wetlands are still being lost and degraded, as are their ecosystem services and the many benefits they provide for people. A workshop discussion will be held to identify key issues and information sources to be included in an Assessment as the basis of further discussion with the Ramsar Convention, particularly in relation to their proposal for a State of the World ֹs Wetlands Report. The workshop will contain initial presentations on:-the status and trends of wetland biodiversity and ecosystem services globally, the extent of responses, and status of main drivers.

20	Specific Constructed Wetlands For Water Treatment, Part One	