



Ministero delle Infrastrutture e dei Trasporti
Magistrato alle Acque di Venezia



The Venice Conference

September 12-15, 2011
Venice, Italy

CONFERENCE REPORT

Improving the Capacity to Assess and to Adapt to
Climate Change in Urban Coastal Regions



CO-CONVENING INSTITUTIONS



Ministero delle Infrastrutture e dei Trasporti
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This report was prepared and edited by Kim McIntyre, Sustainability Solutions Institute, University of California, San Diego with the Introduction by Charles Kennel, UC San Diego.

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*Attendees at the Venice
Conference 2011*





I. EXECUTIVE SUMMARY

About half the world's coastline will be eroded or flooded by the ongoing and currently unstoppable rise in sea level. As many towns and cities are located in low-lying areas associated with bays, estuaries and river outlets, millions of people and trillions of euros worth of infrastructure are at risk in the next 100 years. To cope with these possible impacts of climate change, strategies for implementation of mitigation and adaptation are being developed in many coastal urban regions to reduce the associated costs and dislocations. Such strategies, implemented proactively, may be more economically advantageous than action taken after extreme events and attendant disasters.

While the dimension of climate change is global, impacts are felt locally and therefore, local solutions are necessary. Each region has unique characteristics and interactions between environmental, economic and social factors, as was documented time and again in this conference.

The Italian Republic has defined the problem of safeguarding Venice and its lagoon as one of "primary national importance." Venice and its lagoon exemplify the complexity of the sustainability issue and the evolution of the trade-off between economic development and safeguarding of the environment.

The Venice General Plan of Interventions, safeguarding activities delegated to Venice to provide defense from high waters, sea storms, environmental protection and morphological restoration, is at the forefront in implementing adaptive operational responses for future sustainable environmental and socio-economic development. This system includes a substantial plan of interventions to protect the city's cultural heritage and historical buildings from high waters as well as to preserve the lagoon ecosystem. The plan was defined by the Italian Government after the flood of 1966 and is implemented by the Venice Water Authority (Magistrato alle Acque di Venezia). As part of the plan, Venice is developing a 21st century capacity to manage its waters with the MOSE project, which are rows of mobile barriers that are able to isolate the Venice Lagoon from the Adriatic Sea. The Venice MOSE floodgates, when completed, are designed to protect against high-water events, making a strong, positive contribution to sustainability. In many ways, the Venice System can be considered an international and European benchmark, a "laboratory", as numerous environmental safeguarding activities are underway in Venice.



Aerial view of Venice Lagoon Lido inlet

The Venice Conference brought experts in climate change adaptation to both learn from Venice's experiences and activities, and to provide examples of best practices from around the globe to inform Venetian decision makers in the design of a plan of adaptive management and complementary measures for the Venice system. This plan will integrate, iterate and improve upon ongoing safeguarding activities in order to cope with vulnerability due to climate change and sea level rise.

Experts from government agencies, academia, and non-profit organizations from around the world shared their approaches, results, and inspiration in adaptation planning. Presentations included case studies from New York, California, London, the Netherlands, Alexandria, Japan, Australia, Thailand, Germany, and Africa and other regions. Common themes throughout the success stories included knowledge sharing, coordination among scientific and policy responses, policy options, capacity building and flexibility in the planning process. These and other issues were explored during the break-out sessions and helped shape the Conference Declaration, found in Section V of this report. For full copies of the presentations, visit <http://ssi.ucsd.edu/venice>.



II. INTRODUCTION: ADAPTING TO SEA LEVEL RISE IN THE 21ST CENTURY

How will cities and urban regions around the world adapt to sea level rise? How much will they have to contend with? Can we extrapolate from present observations what the sea level will be in 2050? In 2100? Recent measurements of mountain snows and glaciers, polar ice, and sea level rise are beginning to enable quantitative predictions. Moreover, sea level rise is clear enough conceptually that practical planners have already begun to develop adaptation strategies¹, which help people to picture the economic and social costs.

A series of workshops² designed to bring together scientists and decision makers has begun to frame the issues. The declaration of the Vatican Conference of 2011 summarizes the mountain snow and ice situation well:

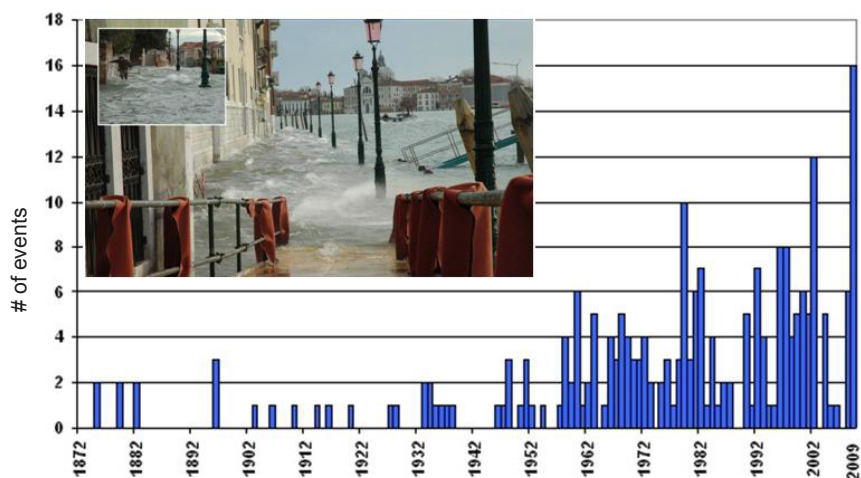
"Glaciers are shrinking in area worldwide.... The widespread loss of glaciers, ice, and snow on the mountains of tropical, temperate, and polar regions is some of the clearest evidence we have for a change in the climate system, which is taking place on a global scale... the rate of mass loss has more than doubled since the turn of the century. Melting mountain glaciers and snows have contributed significantly to the sea level rise observed in the last century."

The declaration of this, the 2011 Venice Conference, characterizes the risks of sea level rise:

"About half the world's coastline will be eroded or flooded by the unstoppable rise in sea level. Many towns and cities are located in the low-lying areas associated with bays, estuaries, and river mouths, and millions of people and trillions of U.S. dollars of infrastructure are certain to be at risk from climate change in the next 100 years."

Global sea level rise is due primarily to two factors: the thermal expansion of the oceans, and fresh water from melting snows and ice. What matters

to coastal cities and wetlands is the local relative sea level and not the global average. Local relative sea level also depends on land subsidence and the local specifics of ocean circulation. A change in local sea level alters the probabilities of damage from storms and storm surges. The public sees the



Distribution of high water events in Venice with levels greater than or equal to 110 cm m.s.l. from 1872 to 2009

¹ Nicholls, R.J. 2011. Planning for the impacts of sea level rise. *Oceanography* 24(2):144–157, doi:10.5670/oceanog.2011.34.

² *Impacts of Climate Change on California and Himalayan Asia*, May 4-6, 2009, La Jolla, CA
Mountain Cryospheric Reservoirs - A link between climate and water availability for societies and natural systems, Aug. 30-31, 2010, Potsdam, Germany
Fate of Mountain Glaciers in the Anthropocene, Casina Pio IV, Vatican Academy of Sciences, April 2-4, 2011, Rome, Italy
The Venice Conference: Improving the capacity to assess and adapt to climate change, Sept. 12-15, 2011, Venice, Italy



(l) Aerial view of Venice Lagoon; (r) conference attendees get a briefing on the MOSE gates

extreme event and not the background rise in sea level, but if local sea level rises, coastal infrastructure and populations are placed at gradually increasing risk from extreme events.

How much risk should each coastal region expect? How should regions at risk prepare? Can they? How much would it cost? How much time do they have?

Science can help with these questions. The rate of global mean sea level rise accelerated from about 20 cm/century in 1950 to 30 cm/century after 1990³. The rates of retreat of the world's three largest ice fields, in Patagonia, Greenland and Antarctica, have accelerated over the past 35 years, and especially in the last decade. The annual ice mass loss from Antarctica increased by 75% between 1996 and 2006⁴. In 2005, the Greenland plus Antarctica contribution to the rate of global sea level rise was 13 cm/century. Extrapolating the observed acceleration, these mass loss measurements together with an estimate of thermal expansion suggest a 30 cm rise from the present to 2050⁵. A 2009 assessment by the State of California forecasts 30-45 cm for 2050⁶.

Cities and regions that have already had to prepare defenses against the sea and inland flooding are strengthening their preparations. Their efforts give some idea of the costs that other, less aware regions face. Tokyo, whose Edogawa district (population 640,000) is below sea level, is already strengthening its defenses of Tokyo Bay. Two regions in Europe with more than five centuries of experience are Venice and the Netherlands. The Venice Water Authority is constructing submerged gates at the three entrances to the Venice Lagoon that can be raised at times of high water. These gates will be effective until local sea level rises above 80 cm. The sea level in the Adriatic is rising at only $\frac{3}{4}$ the global rate, so the MOSE and related interventions can counteract many of the threats of flooding for a century.

This conference examined research and case studies from London, Germany, Australia, New York, Thailand and Africa, in addition to Tokyo, Venice, and the Netherlands. We concluded that in the past three years there has developed a common methodology for identifying the vulnerabilities of the populations and infrastructure in ocean-facing urban regions. There is recognition that each region must develop its own adaptation strategy. And there is growing agreement on how to manage the adaptation process.

³ Church and White, *Geophysical Research Letters*, 2005

⁴ Rignot, et. al., *Nature Geoscience*, 1,108,2006

⁵ Rignot, et. al., *Geophys. Res. Letts.*, 38, L05503, 2011

⁶ D. Cayan, et. al., *California Water Plan Update*, v.4, 2009



The general principles are well expressed by the declaration of the Special Session on Regional Climate Change of the 2010 Kyoto Forum on Science and Technology in Society:

“ Knowledge Action Networks create a two-way flow of information, knowledge and methods between local communities, scientists, opinion leaders and decision makers, and their regional, national and global counterparts... Their functions should include:

- Understanding ongoing natural and social impacts of climate change
- Characterizing the risks of future climate change to the things local communities care about
- Leveraging existing resources and programs
- Providing information flows to ensure that interrelated decisions can be made at the global, regional and local levels
- Building capacity, by filling gaps in available information, by stimulating local analytical capabilities, by providing models and observations generated elsewhere, by sharing best practices, and by promoting general social resilience.
- Translating scientific knowledge and data into locally understandable and useable form
- Communicating the need for and nature of adaptation actions in culturally appropriate ways
- Promoting the development by the international community of technical systems that can be applied to or operated at the local level
- Relaying local knowledge to the regional, national and international communities
- Supporting local leaders as they implement adaptation actions

”



(l-r) Flooding in the wake of Japan's 2011 Tohoku earthquake and tsunami; Venice in 2008; flood waters in the Netherlands

If the examples of Tokyo, Venice, and the Netherlands are representative, it appears that advanced countries can, with planning, defend their most vulnerable populations and valuable infrastructure in the near term, but at high cost.

However, the example of Alexandria and the Nile Delta presented at this Conference makes us pause⁷. The Nile Delta contains some of the most productive farmland in the world; at one time, it fed the Roman Empire, and now it is crucial to feeding Egypt's population of 82 million, which is expected to double by 2050. Intrusions of salt water into the Delta related to sea level rise present a mortal danger to this farmland. Will Egypt be able to cope? After all, Egypt will face much higher costs than the Netherlands to defend a coastline of similar length because it has not had centuries of prior investment.

⁷ I. Serageldin, in The Venice Conference, *Improving the capacity to assess and adapt to climate change*, Venice, Sept. 12-15, 2011



III. CONFERENCE OVERVIEW

The Venice Conference was a 4-day workshop organized by the Venice Water Authority through its concessionary Consorzio Venezia Nuova with the assistance of Thetis SpA and the Sustainability Solutions Institute of the University of California, San Diego. The workshop was designed to support the development of a strategic plan for the adaptive management of the Venice Lagoon system in the face of climate change. Venice is striving to become a model of sustainable management and climate change adaptation in coastal urban regions, and provides an important case study, in addition to being a city of international prominence.

Conference Goals:

- Develop an Expert Network to assist local expertise in developing best practices, needed technologies and assessment capacity in Venice and partner cities.
- Build institutional capacity for Venetian stakeholders to assess the impacts of climate change on their region by creating this network of international experts in policy, science, and technology in support of the work in Venice.
- Promote the translation of adaptation science into policies to guide decision-makers.

Experts from leading institutions around the world convened to discuss how to improve the capacity to assess potential impacts of climate change on urban coastal regions and to identify suitable adaptation measures. Conference themes included: best practices in impact assessment, adaptation planning, and communication; technical issues including monitoring, modeling, and integration; and the economic and social dimensions of strategies for sea level rise and flooding. The first three days included

technical presentations combining a focus on current and future activities in Venice with case studies from other coastal cities adapting to climate change, followed by breakout sessions with discussions and interaction with decision-makers. Conclusions from the breakout sessions helped formulate the conference declaration. The fourth day was a more focused discussion on building an Expert Network to share best practices and institutionalize the recommendations made by the conference attendees. The conference concluded with a public session at which the recommendations were presented to stakeholders from the Venice region.



(l-r) Professor Charles Kennel (UCSD), Eng. Patrizio Cuccioletta (MAV), and Eng. Maria Brotto (Thetis SpA)

The full Conference Program with agenda can be found on the conference website: <http://ssi.ucsd.edu/venice> under "Resources".



IV. BREAKOUT CONCLUSIONS

Speakers and participants were divided into three groups each day, with each group discussing topics from the first presentation sessions:

1. Adverse Impact and Vulnerability Assessment
2. Governance and Socio-Economic Dimensions of Climate Change
3. Physical/Environmental Dimensions of Climate Change and Technological and Engineering Innovation

The purpose of each breakout group was to develop responses to the following issues/questions in the context of the formal presentations:

- Highlight a best practice and/or procedure in (the topic from each session) in your experience.
- What can Venice gain from you/your institution/your region's experiences?
- What can you/your institution/region gain from Venice's experiences?
- How should urban coastal regions facing the same issues discussed during this conference work together?
- In your experience with networks, what works, and what doesn't?

Each breakout group composed and approved the following conclusions. These statements were incorporated into the Conference Declaration (see Section V).



Prof. David Woodruff of UC San Diego (at far head of table) facilitates the Breakout Group 3 discussion.



Breakout group 1 explored lessons from Venice's advanced efforts to protect the city for the next century and beyond.

Breakout Group 1: Adverse Impact and Vulnerability Assessment

Facilitated by Victor de Jonge (Institute of Estuarine and Coastal Studies, University of Hull); rapporteur Kelsey Lamberto (Sustainability Solutions Institute, UCSD)

Venice is an iconic city that has a long history of adapting to physical and social change that offers an opportunity to serve as an international laboratory for innovation. To develop the full potential of this opportunity, we provide the following recommendations that may help regions maintain a healthy, functional and sustainable human and natural system that is resilient and adaptive to change:

1. Reinforce coordination of inclusive leadership with identified roles.
2. Articulate a vision of future goals that reflects the needs of stakeholders and offers a way forward for sustainable development.
3. Create a transparent, overarching system to integrate information from all disciplines, from physical processes and ecosystem functions to socio-economic and cultural dimensions, into decision-making.
4. Establish Venice as a leading international laboratory for innovation in an era of climate change, e.g., by:
 - Upgrade the Water Framework Directive (WFD) requirements by applying DPSIR (Driver Pressure State Impact Response) approach based on assessment of the system's functioning.
 - Upgrade the function of the food web model (carbon flux analysis) with adaptive management.
 - Include socioeconomic and health issues in regional management decisions (e.g., those associated with tourism).
5. Establish an ongoing, independent funding mechanism to support monitoring and research by reserving a percentage (e.g., minimum of 0.1%) of the capital and maintenance costs of the project on an annual basis to be awarded on the basis of peer review.
6. Incentivize and facilitate interdisciplinary science of complex systems to gain new insights, use resources efficiently, and improve decision support to enhance sustainability.





Breakout Group 2: Governance and Socio-Economic Dimensions of Climate Change

Facilitated by Robert Wilkinson (University of California, Santa Barbara); rapporteur Katie Johnson (Fondazione Eni Enrico Mattei - FEEM)

1. Assessment of the impacts of climate change and strategies for adaptation are now widely understood to be evolutionary assessment and response processes. There is now a widely accepted, generalized approach to adaptation planning directed to meet the requirements of a rapidly changing world, in which knowledge of the challenges and opportunities is rapidly transforming. To achieve that, best practice is shaped around a cyclic process of definition of objectives, analyzing relevant systems, assessment of challenges and options, formulation of responses, learning from success and failure (both at the site of adaptation and worldwide), and further adaptation initiatives based on best practice.

2. Effective adaptation should take account of the social and physical needs and objectives of the relevant communities, both as they are understood to be now, and in the future. Consequently, contemporary assessment and adaptation strategies should be shaped around a physical, social, and economic vision of how the community aspires to be in the future.

3. International best practices increasingly reflect an understanding that effective assessment and adaptation responses require involvement of many institutional and community participants. Involving more people early in the planning can help the end process, although this may complicate the task of getting there.

4. Effective involvement requires the free interchange of relevant knowledge, including that of the local community, and open availability of data, modeling and other information, combined with educational and other processes to facilitate that. Openness to participation and credibility of the processes should be priorities.

5. An adaptation initiative (for example a major infrastructure development), which seems best after all consideration in a particular time, may take such a long period to implement that the world and understanding of best practice may have changed during its development or useable lifetime.

6. Italy has embarked on one of the largest construction projects in the world in an attempt to control flooding mediated in part by sea level rise and storm surge in Venice. The scale of this project and financial commitment are very impressive. It is expected to be completed in 2014 and then will become an important part of the infrastructure of Venice. There is much to be learned from this innovation. Nevertheless, important though the barrier is, Venice will continue to face challenges from climate change (including sea level rise). The development of optimum practices for the use of the barrier will also become very important.

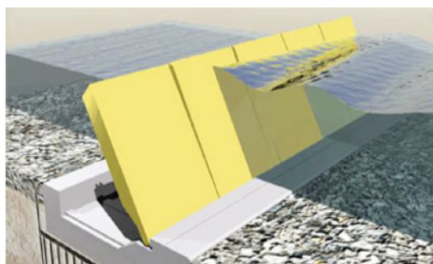


Illustration of MOSE gates.

7. The imminent completion of the barrier is an appropriate moment to further develop Venice's adaptation plans as part of an integrated strategy, which in particular takes into account challenges beyond those which the barrier will address. International best practice would suggest that these plans should be developed considering the Venetian community's and stakeholders' aspirations for the future development of the city.

8. Venice is a global icon and as such provides a particularly clear example of how stakeholders ranging from the local residents to the nation of Italy to international organisations value its longevity. Establishing the stakeholders of a site is increasingly an important matter.



9. The international knowledge-action networks represented at this conference are resources available for the further development of Venice's adaptation plans. They can help to promulgate best practices developed in Venice, and act as a conduit of international insights for the Venice planning process to interact with. The world has a great deal of importance to learn from Venice and its strategies for adaptation.



Breakout Group 3: Physical/Environmental Dimensions of Climate Change and Technological and Engineering Innovation

Facilitated by David Woodruff (University of California, San Diego); rapporteur Michelle Session (Sustainability Solutions Institute, UCSD)

1. We as a conference recognize the unique combinations of engineering and ecology being faced and used by Venice, and the resulting ways of saving the city of Venice and managing the Lagoon with promise and flexibility for the future.

2. To get the best return on these investments, we recommend that Venice examines ways of championing the Lagoon for its history, research, recreation, and education.

3. The grand experiment of gating the Venice Lagoon should be accompanied by appropriate efforts documenting and understanding the resulting evolution of the Lagoon and promoting this experience at the international level.

4. Because the ecological and societal future of the Lagoon is evolving, Venice will need adaptive management strategies and the success of such strategies will depend on high quality, continuous monitoring of the ecological and social systems.

5. In this connection, Venice has an opportunity to seize a global leadership position. In order to fulfill this objective, we recommend that existing entities, both within the Venice Water Authority and outside of it, work together to find open, integrated and connected approaches to the development and conservation of the Lagoon.

6. We also recommend strengthening a regional cooperation and joining international networks such as the Delta Alliance.

7. As a conference, we recognize a number of important research priorities including:

- a better understanding of sea level changes in the Mediterranean and Adriatic;
- a better understanding of the interaction between ecology and the sediment of the Lagoon;
- the role of bio-stabilizing communities;
- interaction of the ecological evolution and social development and how to exploit this in an economic way; and
- development of appropriate mechanisms for the continuous and periodic risk assessments of shifting environmental and social baselines.

8. We recommend that the organizations involved in the Venice System of Interventions organize a major international event at the commencement of the operation of the flood barrier, and organize the relevant networks in time for that event.



VENICE CONFERENCE DECLARATION

The Venice Conference

Improving the Capacity to Assess and to Adapt to Climate Change in Urban Coastal Regions

Venice, Italy September 11-15, 2011

Program Committee: C. Kennel, P. Linden, E. Bonsdorff, M. Dettinger, M. Depledge, N. Adly, J. Falk, D. Woodruff, C. Nasci, G. Cecconi, E. Ramieri, K. McIntyre

BACKGROUND

Over 50 experts from different parts of the world came together in Venice to discuss how to improve the capacity to assess and to adapt to the multiple and interrelated impacts of climate change on urban coastal regions. Themes discussed included best practices in impact assessment, adaptation planning, and communication; the importance of monitoring, modeling, and assessment; and addressing the economic, health and social dimensions of strategies for sea level rise and flooding. The conference specifically addressed:

- Forecasts of future sea-level rise and their reliability, and the impacts on coastal populations and infrastructure;
- Strategies for adaptation to climate change and their implementation;
- Ways of using science to guide decision-makers and support operations managers;
- Building the technical capacity to adapt to the impacts of climate change through monitoring, assessment and decision support;
- The necessity to participate in networks of international experts in policy, science and technology to share scientific knowledge, technological advances, operational experience, and management best practices.

DECLARATION

THE GLOBAL CONTEXT

- About half the world's coastline will be eroded or flooded by the ongoing and unstoppable rise in sea level. Many towns and cities are located in the low lying areas associated with bays, estuaries and river mouths, and millions of people and trillions of U.S. dollars of infrastructure are certain to be at risk from climate change in the next 100 years.
- A new philosophy and methodological approach to climate change adaptation is emerging as regions around the world begin to prepare for the inevitable.
- The world has much of importance to learn from Venice and its approach, and Venice has equally much to learn from the world.
- Venice should actively participate in international knowledge action networks, to stay abreast of the most modern thinking about adaptation, to leverage resources, share best management practices, develop common communication strategies, promote collective actions, and identify markets for its technologies.
- Venice should use its lagoon as an international test-bed for research, technological innovation, and education.



- The eyes of the world will be on Venice when the MOSE project is completed in 2014. There will be major events that celebrate Venice and its achievement, and the world will want to know its next steps in promoting a sustainable future for the city and the lagoon. The time to prepare is now.
- We stand ready to help convene a global conference devoted to promoting the social, economic, and environmental sustainability of coastal cities and urban wetlands for sharing the Venetian experience.

ANTICIPATING THE IMPACTS OF CLIMATE CHANGE

- Venice has adapted to environmental and social change for centuries. Now, it is more ready to prepare to adapt to climate change and the associated sea level rise.
- The challenge of preserving Venice's iconic cultural heritage has given it an early start towards becoming a global leader in the management of urban coastal ecosystems and environmentally sound engineering.
- The MOSE project exemplifies Venice's leadership in the integration of ecology and engineering.
- The MOSE and related interventions can counteract many of the threats of flooding so long as Adriatic sea level rise stays below 80 cm. For planning purposes, the UK and California are projecting 180 and 140 cm global sea level rise, respectively, by the end of the 21st century, because there the sea level rise could be higher than in the Northern Adriatic Sea.
- Maintaining long-term links with the international science, policy, and management communities can help Venice and all the coastal cities anticipate future impacts of climate change in time for an effective response.

MANAGING FOR SUSTAINABILITY

- The transition from construction to operation of the MOSE barriers will occur in 2014. Interest will shift to use the gates to promote the sustainability of the lagoon's social, economic and ecological system, once the engineering challenges have been overcome.
- You cannot manage what you cannot measure. The coupled socio-economic, climatic, and ecological processes affecting Venice and all the coastal cities must be documented, integrated and understood.
- You cannot manage what you do not understand. In a complex system, it is especially important to understand multiple interactions, for example, between social and environmental change, and between environmental change and health and well-being.
- You can only manage a complex system adaptively. Risks must be frequently assessed and adaptation strategies modified accordingly.
- You cannot manage what your stakeholders do not understand. Above all, a compelling long-term vision, clear goals, transparency, and inclusive decision-making processes are essential.

Our findings accord with those of the Venice Sustainability Advisory Panel.¹

¹ Magistrato alle Acque di Venezia - UC San Diego, Sustainability Solutions Institute - 2009. Venice Sustainability Advisory Panel, through its Concessionary, Consorzio Venezia Nuova.



VI. APPENDIX A - PRESENTATIONS

This section lists the presentations given during the plenary sessions of the conference. For copies of the full workshop presentations and links to publications and research, visit <http://ssi.ucsd.edu/venice>.

Session 1: Best Practices in Adverse Impact and Vulnerability Assessment Process

Moderator: Michael Dettinger (Scripps Institution of Oceanography, UC San Diego)

[Sustainable Management of Venice Lagoon Facing Climate Change](#)

Presented by Emiliano Ramieri, Thetis SpA

[Towards A Sustainable Venice: A Real-time Management System](#)

Presented by Jorg Imberger (Centre for Water Research, University of Western Australia)

[Mainstreaming climate change adaptation into strategic environmental planning - some experiences in the UK](#)

Presented by John Seager, UK Environment Agency

[The North Adriatic coastal system: how does the legacy of human activities affect the impact of future climate change?](#)

Presented by Fabio Trincardi, Venice – CNR-ISMAR

[Sea Level Rise and Extreme Events in California: How the State is Advancing Science-based Policies to Reduce Risks to Human Safety, Infrastructure, and the Ecosystem](#)

Presented by Amber Mace, California – Ocean Protection Council



Session 2: Best Practices in Adaptation in Urban Coastal Regions: Governance, Socio-Economic and Physical/Environmental Dimensions of Climate Change Adaptation: Approach and Methods

Moderator: Carlo Carraro (University of Venice)

[Best Practices in Adaptation in Urban Coastal Regions: Governance, Socio-Economic and Physical/Environmental Dimensions of Climate Change Adaptation: Approach and Methods](#)

Presented by Carlo Giupponi, University of Venice

[Climate change impacts: implications for coastal communities](#)

Presented by Michael Depledge, ECEHH

[Urban planning for resilience – Lessons from applications in developing countries](#)

Presented by Federica Ranghieri, World Bank

[The Internet of Things: Introduction, Applications and Implication for Climate Change](#)

Presented by Flavio Bonomi, CISCO

[The Sustainability of Venice System: analyses and evaluation](#)

Presented by Cristina Nasci, Thetis SpA



Session 3: Best Practices in Adaptation in Urban Coastal Regions: Governance, Socio-Economic and Physical/Environmental Dimensions of Climate Change Adaptation: Experiences and Solutions

Moderator: Erik Bonsdorff (Åbo Akademi University)

[Risk Assessments and Adaptation Strategies for Alexandria, Casablanca and Tunis](#)

Presented by Anthony Gad Bigio, World Bank

Associated publication: [Climate Change](#)



Session 3 moderator Erik Bonsdorff of Finland's Åbo Akademi University (at right) with presenter David Major of Columbia University's Earth Institute

[Adaptation and Natural Disasters Preparedness in the Coastal Cities of North Africa](#)

[Climate Change Adaptation in New York City](#)

Presented by David Major, Earth Institute, Columbia University

[Climate Change Adaption and Disaster Risk Management: Challenges and Emerging Solutions](#)

Presented by Joachim Prey, Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ)



Session 4: Best Practices in Technological and Engineering Innovation

Moderator: Paul Linden (University of Cambridge and University of California, San Diego)

[Sea level rise for Venice and its implications](#)

Presented by Pier Vellinga, Wageningen University

[INCREASED RISK: Flash flood and Flood tide and TSUNAMI - Adaptation in below sea level regions](#)

Presented by Nobuyuki Tsuchiya, Environmental Public Works, Tokyo



Session 5: Building Best Practices Knowledge Action Networks

Moderator: Charlie Kennel (Sustainability Solutions Institute, University of California, San Diego)

[Delta Alliance: A global network for the resilience of deltas](#)

Presented by Wim van Driel, Delta Alliance

[APRU-CMAS & knowledge-action initiatives with water communities](#)

Presented by Jim Falk, APRU-CMAS

[Building Capacity in Asia and Africa to Address Cities at Risk](#)

Presented by Gordon McBean, START

[Findings and follow-up Delta Committee](#)

Presented by Bart Parmet, Delta Committee

[Science, the endless frontier](#)

Presented by Antonio Navarra, Euro-Mediterranean Center for Climate Change

Ismail Serageldin (Library of Alexandria)



VII. APPENDIX B - LIST OF PARTICIPANTS

Dr. **Noha Adly**, Bibliotheca Alexandrina
 Mr. **Marcello Aitiani**, Venice Lagoon Artist
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VIII. RESOURCES

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The Venice Conference website
<http://ssi.ucsd.edu/venice>

Magistrato alle Acque di Venezia
<http://www.magisacque.it/>

Consorzio Venezia Nuova (concessionary of
 Magistrato alle Acque di Venezia)
<http://www.consorziovenezianuova.com/uk/default.htm>

Thetis SpA <http://www.thetis.it>

Sustainability Solutions Institute <http://ssi.ucsd.edu>

Activities for the safeguarding of Venice and its
 lagoon (Venice Water Authority's public information
 site) <http://www.salve.it/uk/>

University of Cambridge <http://www.cam.ac.uk>

Università Ca'Foscari Venezia <http://www.unive.it>

Bibliotheca Alexandrina <http://www.bibalex.org>

Association of Pacific Rim Universities
<http://www.apru.org>

European Centre for Environment & Human Health
<http://www.ecehh.org>

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<http://www.minambiente.it/>





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