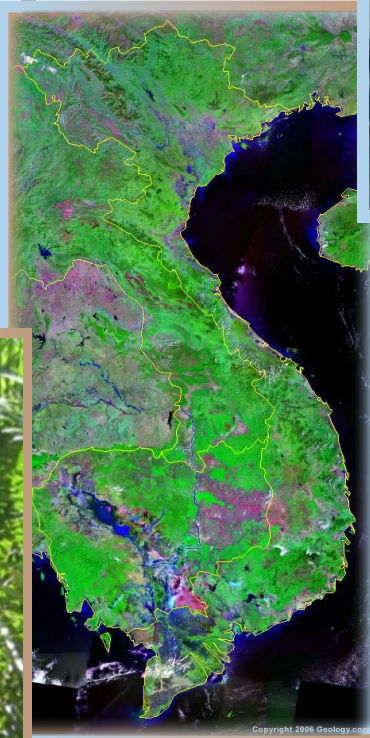




# Climate Change Working Group



## United States - Socialist Republic of Vietnam 2010 -2011 Mid-Year Progress Report



# **U.S. - VIETNAM CLIMATE CHANGE WORKING GROUP PROGRESS UPDATE– DECEMBER 1, 2010**

On June 24, 2008, the President of the United States of America and the Prime Minister of the Socialist Republic of Vietnam signed a joint statement between the United States and Vietnam. The two leaders agreed to work together to promote Vietnamese climate change adaptation and mitigation efforts, including the formation of a new working group under the U.S.-Vietnam Science and Technology Agreement. The Climate Change Working Group (CCWG) promotes ongoing discussions between scientists in the United States and Vietnam and helps coordinate joint initiatives.

The U.S.-Vietnam Climate Change Working Group (CCWG) met in Hanoi from 31 March to 2 April 2010 and developed a program of cooperative work and projects. Priorities for cooperation included:

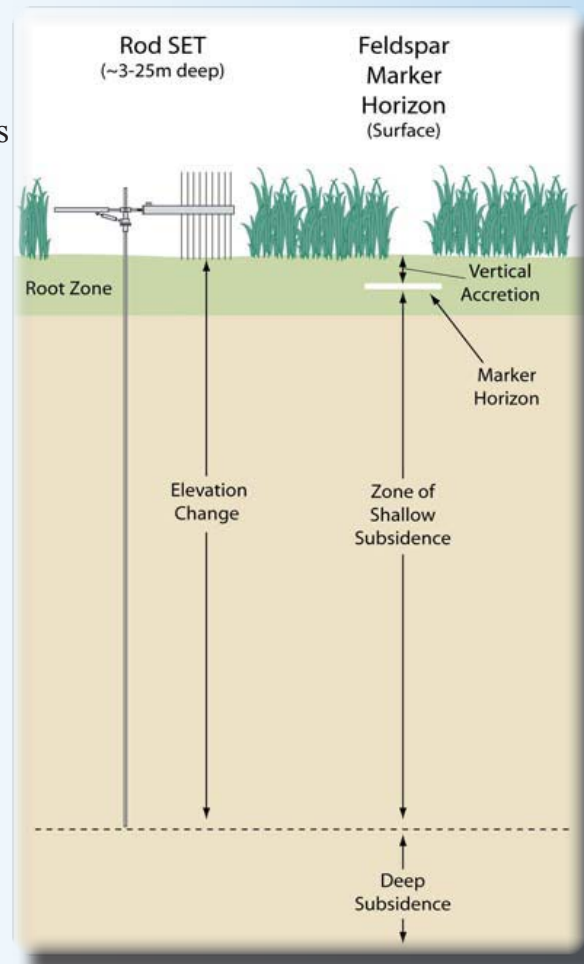
- I. To establish benchmark Surface Elevation Table (SET) devices on the Vietnam coast to measure coastal elevation change, the first step in modeling coastal vulnerability to climate change.
- II. U.S. scientists (USGS) working with the Intergovernmental Panel on Climate Change (IPCC) developing the Third National Assessment for the U.S. would invite Vietnamese scientists to participate in the assessment process in order to build scientific assessment capacity in Vietnam.
- III. Disaster risk reduction and response training would be initiated to increase Vietnam's capacity to respond to climate change related events such as floods, landslides, and typhoons.
- IV. Cooperative efforts to share information and create programs to enhance education and community engagement would be expanded with a focus on climate change adaptation.

## **PROGRESS AND PROPOSED CCWG ACTIVITIES FOR 2010-11 (UP TO 2015)**

### **I. Assessing Coastal Elevation Change and Modeling Coastal Vulnerability**

In July 2010, Drs. Donald Cahoon and Gregory Smith traveled to Vietnam to install the first Surface Elevation Table (SET) devices on mainland Asia. On 19 July, an announcement ceremony took place at Vietnam National University (VNU) – Ho Chi Minh City that included University Vice President Le Quang Minh. VNU's scientific team was led by Dean Triet Tran and included 6 faculty and graduate students. Ministry of Natural Resources and Environment (MONRE) was invited to participate in both the ceremony and field work and USGS offered to support in-country travel; however, scheduling conflicts precluded their participation.

The SET system is based on establishing a benchmark elevation at a specific site by driving stainless steel rods to bedrock or a stable layer in the subsurface several meters deep. Researchers return to these sites periodically to obtain surface elevation measurements. An adjustable measuring device is attached to the permanent benchmark to obtain readings of the land surface relative to the benchmark. Coastal wetlands, including mangroves, can build elevation (accretion) by the accumulation of sediments and organic matter or vegetation. Subsidence also can occur in these areas as sediments undergo compaction or if gas, oil, or water withdrawals create subsurface voids. Erosion is another process that reduces elevation and is measured using the SET methodology. USGS has developed sophisticated models to integrate small changes in elevation over time into forecasting long-term elevation changes and ultimately producing coastal vulnerability models.



Vietnamese and U.S. scientists installing coastal elevation measuring equipment, in the mangrove forests at Can Gio, to assess coastal vulnerability.

On July 20, 2010, the joint U.S. -Vietnam team selected a site for the installation of three SET devices in the Can Gio Biosphere Reserve. The steel rods and additional equipment were shipped from the manufacturer in the U.S. to Seattle where the U.S. Embassy –Hanoi graciously arranged transport to Hanoi. From Hanoi, the equipment was shipped to Ho Chi Minh City where VNU staff prepared it for installation. On July 20th, the first SET device was installed and VNU scientists trained in the installation process. On July 21st, VNU scientists installed two more devices at the site in a mangrove forest near a ranger station. The equipment was transported by boat and hand carried through the mangroves by the crew. On Day 2, the team was joined by Jillian Bonnardeaux and an intern from the U.S. Consulate – Ho Chi Minh City (HCMC), as well as a video team from the Biosphere Reserve that interviewed the scientists during the field work. On July 20, 2010, Vietnam became the 23rd country in the world to receive an SET system to monitor and assess coastal vulnerability.

On July 23, 2010, the team traveled to Ca Mau and then south to the coastal mangrove forests at the extreme southern point of Vietnam. Working with the Mui Ca Mau National Park Director, a site for an installation of 3 additional SET devices was selected. The U.S. team plans to return in March 2011 to:

- Install an additional 3 SETs south of Mui Ca Mau National Park
- Provide in-depth training for data management and modeling coastal vulnerability to VNU, MONRE, and other scientists in Vietnam including NGOs.
- Meet with scientists, government officials, and NGOs in Cambodia and START International in Thailand to begin the expansion of the Coastal Vulnerability Network throughout Southeast Asia.

While SET devices are installed in 23 countries and data are collected by hundreds of cooperators and investigators, there has never been a global summit to share data and chart a course for future development of this global network. A Global Coastal Vulnerability Summit is now being considered for late 2011 in Ho Chi Minh City. Plans are rapidly developing to continue installations south of Ca Mau, Vietnam and in the Mekong Delta. Equipment is being purchased and shipped to VNU for distribution in Vietnam, Cambodia, Thailand, and Malaysia.



Global Surface Elevation Table (SET) Coastal Vulnerability Network.  
Red dots are locations of SET monitoring sites.

**Training in Vietnam: Modeling Coastal Wetland Vulnerability** A training workshop will be offered by USGS that will focus on a framework for assessing wetland vulnerability to sea-level rise that will inform decisions for their management and adaptation to current and future environmental change. The workshop will be built around four modules: 1) Marsh Elevation. Demonstrate techniques to determine the elevation of the wetland relative to a tidal datum. 2) Trends in Elevation. Demonstrate how wetland accretion and elevation trends relative to sea-level rise can be developed using the Surface Elevation Table – Marker Horizon method (SET-MH). 3) Controls on elevation trends. Illustrate and explain the processes controlling wetland elevation change and how they can be measured. 4) Determining future responses of wetlands. Demonstrate how to use the data from Steps 1-3 to calibrate and validate models for projecting future wetland responses to environmental and climate change.

## II. Partnership to Design a National Assessment

Dr. Virginia Burkett, USGS Chief Climate Scientist and a member of the CCWG, is working on the third U.S. National Assessment mandated by the US Global Change Research Program (USGCRP) Act of 1990. Nine workshops will be conducted in the United States over the next six months. Dr. Burkett and Dr. Kurt Johnson, USFWS and CCWG member, have offered to conduct a workshop in Vietnam and are working with Co-chair, Professor Thuc to schedule the workshop in early 2011. In the context of the Vietnam National Target Program for Climate Change, it is opportune to consider a Vietnam

National Assessment, especially in the context of stakeholder engagement in the national assessment process. For this purpose, two workshops are proposed for 2011. The first workshop will validate the high resolution downscaled climate model results for the Lower Mekong region that have been generated by USGS and National Center for Atmospheric Research (NCAR). The proposal is to hold this workshop during 2011 in Hanoi and to coordinate with the Vietnam Co-Chair of the CCWG, Professor Thuc. The second workshop will be held in the later part of 2011 in the U.S. and will focus on effective strategies for stakeholder engagement at district, municipality, community, and State scales. Outputs of both workshops will benefit the Vietnam National Target Program on climate change.

## III. Disaster Response Training and Cooperation

Since 1996, Pacific Disaster Center's (PDC) mission is to provide applied information research and analysis support for the development of more effective policies, institutions, programs, and information products for the disaster management and humanitarian assistance communities of the Asia Pacific region and beyond. PDC has been supporting the Government of Vietnam (GOV) since 2004 to develop institutional capacity and share international practices in Disaster Risk Reduction (DRR). PDC senior staff has actively participated in the U.S.-Vietnam Joint Committee Meetings for Science & Technology Cooperation and serve on the U.S.-Vietnam Climate Change Working Group under the bilateral Science and Technology (S&T) cooperation framework, including chairing the DRR sub-group. In August 2009, PDC significantly bolstered its presence in the region with the establishment of a new Southeast Asia Program Advisor position. Based in Hanoi, Mr. Nathan Sage supports PDC's engagement with national disaster management authorities, international organizations and strategic-development partners in the ASEAN region (e.g., Asian Development Bank (ADB), International Federation Red Cross (IFRC), United Nations Development Programme (UNDP), U.S. Agency for International Development (USAID), World Bank), develops programmatic opportunities, and supports project coordination.



Dr. Virginia Burkett, USGS Chief Climate Scientist, providing climate change research training in Southeast Asia, 2009

Mr. Sage is a specialist in climate change policy, disaster management and environmental sustainability who previously served as the first Environment, Science, Technology and Health (ESTH) Officer and USAID/Vietnam Environment Program Manager to the U.S. Mission in Vietnam.

The U.S. Trade Development Agency (USTDA) and Ministry of Agriculture and Rural Development (MARD) signed a grant on August 14, 2009 for the Flood Modeling and Early Warning Capacity Development (FEW) Pilot Project in Vietnam. USTDA Acting Director Ms. Leocadia I. Zak, U.S. Ambassador to Vietnam Michael W. Michalak, and other U.S. Government representatives attended. MARD



Minister Cao Duc Phat and USTDA Acting Director Zak highlighted, in their official remarks, the importance of the project both in terms of strengthening U.S.-Vietnam relations and protecting the lives of Vietnamese citizens. A contract valued at \$582,853 was subsequently signed by MARD Disaster Management Center (DMC) and PDC. The technical assistance project seeks to demonstrate a web-accessible Decision Support System that will enhance capacity for flood and storm early warning at national and provincial levels with a focus on the coastal provinces of central Vietnam. The project comprises eight tasks to be conducted from April 2010 to October 2011.

In support of the USTDA FEW Project, several activities have been undertaken in 2010, including: 1) Project Kick-off Meeting held at MARD in Hanoi (April 6); 2) Stakeholder Workshop in Danang with MARD and MONRE officials from central, regional and provincial levels including a field trip to the newly constructed Danang Flood and Storm Center (built by U.S. Army Corps of Engineers), the MONRE Regional Hydromet Center, and a typical flood gauge station and community shelter in the Vu Gia-Thu Bon River floodplain (May 11-12); 3) development of a Concept of Operations (CONOPS) for improved information and communications technologies; 4) meetings with provincial stakeholders as part of a preliminary data collection mission (hazards, critical infrastructure) in Quang Nam Province (October 25-28); and 5) training in the Disaster AWARE Emergency Operations System (EMOPS v4) for disaster managers of MARD, UNDP, Red Cross and International NGO (iNGOs) in Hanoi (November 8-9). Vietnam's Water Resources University partners with PDC to implement this project.

The World Bank/MARD Natural Disaster Risk Management Project (NDRMP): In August 2009, PDC was awarded the NDRMP contract to develop an Education and Training Program for disaster managers across various agencies in Vietnam. Outputs of the activity, implemented from August 2009 to June 2010, include the development of a disaster management curriculum comprising six modules (in English and Vietnamese) taught in four consecutive two-week sessions; significant train-the-trainers effort, and training of 100 disaster managers at central and provincial levels in 12 provinces. Courses included: Multi-Hazard Disaster Management, Natural Hazards of Vietnam, Disaster Communications, Decision Making and Problem Solving, Mapping for Disaster Management, and Disaster Risk and Vulnerability.

In 2009, PDC Deputy Executive Director Chris Chiesa participated in the APEC Taskforce for Emergency Preparedness (TFEP) – U.S. Interagency Working Group meeting hosted by the U.S. State Department. The meeting was joined by representatives of Department of State Office of Economic Policy, Department of Homeland Security (DHS) Office of International Affairs, DHS Office of Policy Development, and NOAA Office of International Affairs. The working group also includes, DoD and USGS, but they were not able to attend this meeting. The primary topic of discussion was PDC's preparation of a concept paper for a hazard mapping and risk assessment workshop to fill cited gaps at a recent TFEP forum in Lima, Peru. The workshop was subsequently approved and convened in Hanoi. At the invitation of APEC TFEC, PDC Deputy Executive Director Chris Chiesa participated in the Third Annual APEC Emergency Management CEOs' Forum, September 15–17, which was hosted by the Vietnam Ministry of Foreign Affairs and MARD in Hanoi. Chiesa presented a paper entitled *Overview of Disaster Risks and Management in the Asia Pacific Region: Implications of Development, Growth and Regional Cooperation*.

October 20-21, 2010, PDC and the National Center for Disaster Reduction of Chinese Taipei conducted an APEC Hazard Mapping and Risk and Vulnerability Assessment Workshop, which included participation of more than 70 governmental representatives of 11 Pacific Rim “economies”—from North America, South America, Oceania, Southeast Asia and East Asia, including Vietnam. The workshop consisted of lectures, group activities, and hands-on activities using GIS. This workshop was co-funded by APEC and USAID.

Supporting Vietnam's efforts in adaptation to climate variability for Ho Chi Minh City (HCMC) Vietnam, PDC and the Ho Chi Minh City Institute for Development (HID) signed a Memorandum of Understanding in May 2009 supporting the development of a new master plan for HCMC, specifically including an examination of the issue of climate change risk to new development areas and infrastructure. Research cooperation will emphasize studies of sea-level rise and flooding in HCMC and El Nino Southern Oscillation (ENSO) variations, as well as making arrangements for essential data sharing and assistance from HID officials. Many of these information-sharing efforts have already begun.

As part of the International Program on Climate Change and Variability Risk Reduction (IP-CVR), Dr. Nguyen Huu Ninh visited PDC headquarters in Maui from June 8-11, 2009 to solidify agreements this new Program. The global program is envisioned as a way to focus on disaster risk reduction policies and practices, based on the latest science and information regarding climate change and variability, and its anticipated impacts on shifting natural hazard risks. The vision of the IP-CVR was sparked in 2008 at a meeting that brought together more than 20 international experts to discuss "Shifting Risks" related to the climate change. The Expert Working Group concluded that, despite much valuable research in climate change and variability, not enough attention is being given to the practical utility of the scientific work to the end users, i.e., policy makers, risk reduction practitioners, and the general public. A website has been developed and is hosted by PDC to support the formal and informal networking of the IP-CVR group members and others. (See <http://ipcivr.net/>) PDC has offered to CCWG and its members the use of the IP-CVR Collaboratorium for information sharing and activity tracking.

Regular Consultations with the Government of Vietnam and International Organizations to support DRR in Vietnam were held throughout 2009 and 2010 with PDC senior staff engaged in high-level policy and technical discussions with the MARD Directorate of Water Resources Disaster Management Center, MONRE National Hydro-meteorological Service, Water Resources University, Vietnam Academy of Science and Technology, ADB, UNDP, UNISDR, UN Habitat, U.S. Department of Defense, USAID, U.S. State Department, World Bank as well as ASEAN Secretariat and APEC TFEP to develop international cooperation for improved disaster and climate risk reduction in Vietnam and the region. PDC achieves this objective through various policy dialogues, international workshops, meetings, and technical assistance projects and staff exchanges.



## IV. Capacity Building, Higher Education, and Community Engagement

In collaboration with the IPCC, the global change System for Analysis, Research and Training (START), a capacity building NGO based in U.S. and supported by the USGCRP agencies, is conducting a series of national and municipal level science-policy dialogues based on both the 4th IPCC Assessment results and in the context of ongoing 5th IPCC Assessment. The USAID has provided funding support to START to engage municipality-level communities in major cities of Asia under START's Cities at Risk Program. Under this funding, START will work closely with MONRE/Vietnam and administrations of two major cities in Vietnam (Hanoi and Ho Chi Minh City) during the 2011-2012 timeframe. Capacity building activities will include training in methods and tools for analysis of city-scale vulnerability to climate changes. START will also support engagement of Vietnamese scientists in research on disaster risk at the START-affiliated International Center for Research on Integrated Disaster Risk base at the Academia Sinica. Related in Vietnam through graduate student and faculty exchanges and curriculum development (on risk management; sectoral issues, such as water resources demand/management/governance, food systems and sustaining ecosystem goods and services; etc.).



START Cities at Risk Program

The Maryland-Asia Environmental Partnership (MD-AEP) and its mission sponsors, including I.M. Systems Group, Washington Laboratories, Whiteford, Taylor & Preston, Columbia Analytical Services, led a highly successful trade and training mission to Vietnam during May 24-28. The focus of the mission was a series of five different environmental business events attended by over 450 business, government and academic leaders. The events, held in Hanoi and Ho Chi Minh City, were co-organized with the U.S. Embassy and Vietnamese government through the Vietnam Administration for Seas and Islands from the Ministry of Natural Resources and the Environment and the Directorate for Standards and Quality from the Ministry of Science and Technology and also in collaboration with the Vietnamese Chamber of Commerce and Industry (VCCI).

Vietnam's rapid double digit industrial growth over the past 10 years has negatively impacted its environment and there is an increasing sentiment to address the country's pollution and its water, energy and climate change needs. The World Bank estimates that Vietnam needs \$2.5 billion per year to deal with environmental pollution because of its rapid industrialization. There is a growing awareness within the population regarding the imbalance of the country's ecosystems caused by a lack of environmental stewardship a realization that both public health and economic interests, particularly in agriculture and fisheries, are at stake. As Vietnam continues its emergence as an "Asian Tiger," mission organizers felt that the timing was very good for the initiative as the country is reviewing sustainable options that will help it leap ahead and not make the same costly environmental mistakes as the developed world and its neighbors.

The mission organizers hosted a U.S. Embassy briefing for the delegation, two business matchmaking forums with the local Vietnamese Chamber of Commerce and Industry and a reception at U.S. Ambassador Michael W. Michalak's residence to kick off the week. This was followed by two environment and climate change forums on May 25 in Hanoi and May 27 in Ho Chi Minh City. The Ambassador welcomed the group and highlighted the importance of establishing public-private partnerships for addressing the environment and climate change needs in Vietnam. Ambassador Michalak highlighted the fact that this year marked the 15-year anniversary of U.S.-Vietnam engagement and the ever-improving commercial relationship between our two countries. The U.S. delegation members participated in the private matchmaking events and also spoke at each of the forums.



Maryland-Asia Environmental Partnership:  
Environment and Climate Change Conference

Delegates from the U.S.-Vietnam Climate Change Working Group also participated in the events. Dr. Tran Truc, Director General of the Viet Nam Institute of Meteorology, Hydrology and Environment and Co-Chair for the USGS/Viet Nam sponsored conference, delivered a talk on climate change. Another delegate of the Working Group, Vance Hum, President of I.M. Systems Group, lead two panel discussions. The first, in Hanoi, featured a debriefing by Dr. Clement Lewsey, Director, International Programs, National Ocean Service, NOAA, from a recently concluded Memorandum of Understanding (MOU) between NOAA and Viet Nam's Administration of Seas and Islands, MONRE. The second, in Ho Chi Minh City, was directed at environmental impacts to agriculture and fishing exports. Other participants from the delegation included executives from the Maryland-Asia Environmental Partnership, Washington Laboratories, Insight Engineering, AmericanTCB, Columbia Analytical Services, Whiteford, Taylor & Preston, LLP, Bluewing Environmental Technologies, WECK Laboratories, the University of Maryland Center for Integrative Environmental Research and the University of Maryland College of Agriculture and Natural Resources.

"I can tell you that these firms represent a great wealth of technology solutions and scientific applications across the whole spectrum of environmental challenges and climate change," said Ambassador Michalak.



Mr. Vance Hum, IMSG and Mr. Ted Gattino, Bluewing Environmental Technologies leading discussions.

As a result of the forum, mission organizers have been asked to return to host a second event in Vietnam in 2011. Additionally, opportunities are being explored by delegation members to develop exchanges for laboratory testing and food safety between the two countries. "We see great opportunities to provide Vietnam with a knowledge-sharing hub on environmental lessons learned, technologies and models of how other countries have address similar problems with affordable solutions," said Peter Gourlay, President of the Maryland-Asia Environmental Partnership and U.S. Chairman of the VNEF. "We are committed to Vietnam, and see last week's forums as an opening engagement in helping the country achieve its sustainable economic development goals," he said.

## ADDITIONAL PROPOSED ACTIVITIES

- **Establish a Lower Mekong Monitoring Program to Assess Hydropower Impacts on Sediment and Elevation of Critical Areas:** *Expansion of Surface Elevation Table Measurements along the Mekong River to establish baseline elevations. The Effects of Dams on the Wetland Habitats of the Mekong River.* The construction of dams on the Mekong River will reduce the river's discharge rate and sediment load by trapping water and sediment in the upstream reservoirs; the greater the number of dams, the greater the reductions. These changes to the river will have direct and significant impacts to the river's wetland environments. The reduction in sediment load will decrease the accumulation of sediments in the wetlands that are needed to counteract the effects of underlying sediment compaction (i.e., subsidence). This is particularly the case for the Mekong Delta where the sediments are needed to counteract both high rates of subsidence and rising sea levels.



But it is also the case for wetlands in the upper portions of the river where the historic sediment deposits underlying the riverine wetlands are likely compacting. Large reductions in sediment load and the effects of subsidence will result in extensive wetland loss in both the inland portion of the river and the delta, as is happening in other major deltas around the world (e.g., Mississippi River delta). The reduction in river discharge will exacerbate this problem in the delta by allowing coastal erosion processes to become more prominent. What is not known is the rate of subsidence for these varied environments. Hence, we do not know what minimum riverine sediment load and rate of wetland sediment deposition is required to counterbalance subsidence and prevent wetland submergence and loss. A network of surface elevation table – marker horizon (SET – MH) stations established in wetlands across the Mekong Delta and inland along the Mekong River can be used to determine the minimum requirements by measuring current local rates of sediment deposition, elevation change, and shallow subsidence before the dams are constructed. With this approach, the current vulnerability of Mekong River wetland habitats to the effects of subsidence and sea-level rise can be evaluated. In addition, the SET – MH data can be used in numerical models to project the future vulnerability of Mekong River wetlands to the effects of projected reduced sedimentation and accelerations in sea-level rise. Both the current and future vulnerability outcomes can be used to establish minimum thresholds for sediment loads of the river.

- In January 2011, the Pacific Disaster Center (PDC) anticipates beginning a five-month NDRMP activity to review the Management of Post-Disaster Recovery Phase in Vietnam. The activity, which involves working closely with MARD and the Ministry of Finance, will review the legal framework, economic impacts, data/ information systems and general management associated with damage and needs assessments and district-level requests for post-disaster small infrastructure, with an emphasis on climate variability. The activity will include assessments in five provinces that experienced various, recent natural disasters, and will include recommendations for how to improve the management of post-disaster recovery efforts. PDC was unsuccessful in efforts to win a third NDRMP activity, related to Geographic Information Systems (GIS) training program in partnership with ESRI Vietnam.

- **Climate Change Impacts Assessment for Critical Conservation Areas:** This effort will focus specifically on developing an assessment program and models to forecast impacts of climate change on critical conservation areas in Vietnam. The emphasis will be on ecosystems and habitats critical to endangered and threatened species, National Parks, and areas important to migratory species and species of special international concern.

- **Ecosystem Services and Food Security in Mekong River Basin:** United States Agency for International Development (USAID), Regional Development Mission for Asia (USAID/RDMA) plans to implement a "Mekong River Basin Climate Change Adaptation Project (MRB-CCAP) program. The objectives of the program are to: strengthen human and institutional capacity to develop and implement climate change adaptation plans and strategies; strengthen policies, tools, methodologies and practices for ecosystem services valuation and climate resiliency; demonstrate and scale-up model actions for integrated approaches to climate change adaptation; and strengthen and sustain regional learning networks to share and replicate best practices. USAID/RDMA envisions a five-year program incrementally funded over five years with an estimated budget ranging from \$9 million to \$9.9 million (subject to availability of funds). Program activities are expected to be a comprehensive study of the likely impact of climate change on prevalent agriculture subsectors and ecosystems in the Basin. The study will apply hydro-meteorological data from atmosphere-ocean general circulation models to agriculture suitability and ecosystem envelope models to forecast the expected changes, assess the probable impacts, and develop adaptation strategies. This information will be used in the implementation of 5 to 6 integrated ecosystem and community based adaptation pilot projects in representative ecosystems in the Basin. During the implementation of the pilot projects, data will be systematically collected and analyzed to provide a better valuation of the ecosystem services on which the communities depend, and this will be used to provide guidance on national policies related to valuing ecosystem services. The costs and benefits of the pilot projects will be carefully monitored and successful practices will be drawn together to develop, at a pre-feasibility level, potential national integrated ecosystem and community based adaptation projects that could be eligible for financing from climate change adaptation funds. Lessons from the project will be widely disseminated through a regional knowledge center platform. The request for proposals for the program was posted online in November 2010.

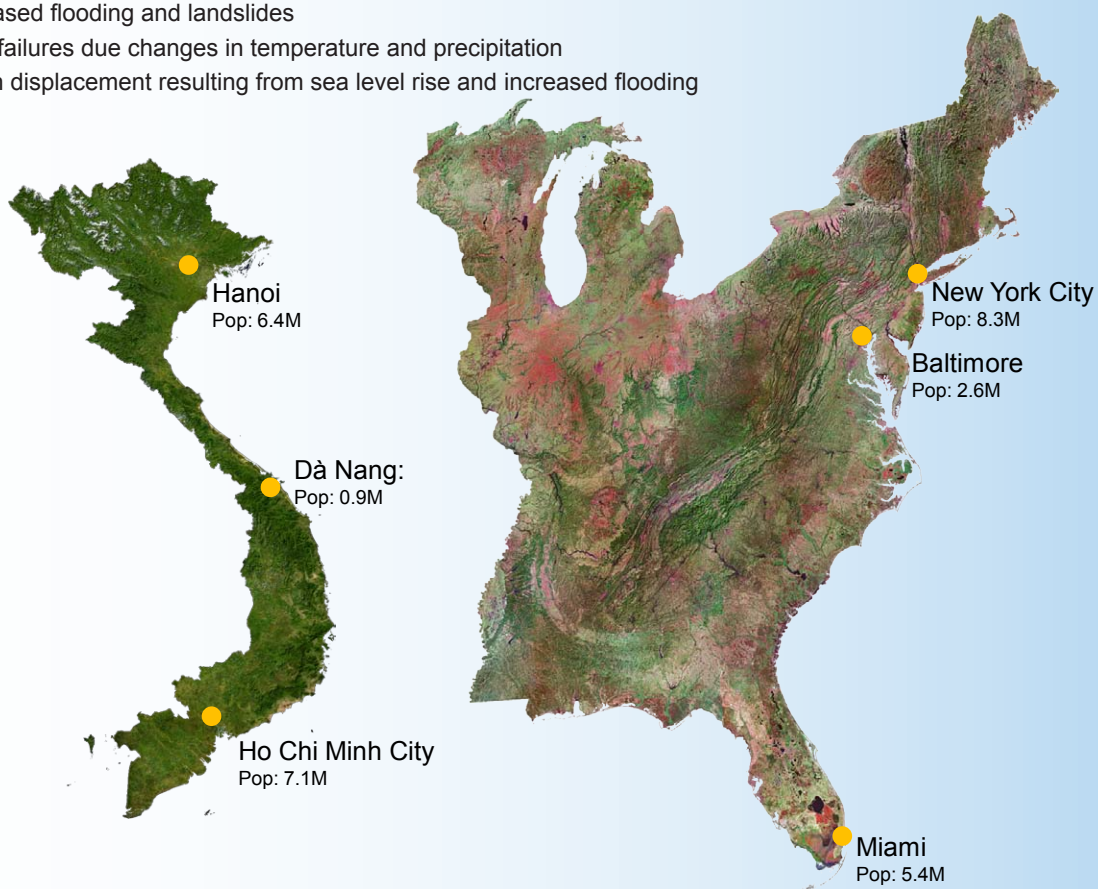
- **CCWG Science Forum Conference:** This conference would take place in 2012 in Vietnam and may include other Mekong Watershed nations.
- **Global Coastal Vulnerability Conference:** This would take place at VNU-HCMC in late 2011 and would include representatives from all 23 countries engaged in the network. Data sharing, model development, and training would be major themes at this historic conference.
- **CCWG Science Forums – Enhancing Opportunities for Cooperation:** The US side of the CCWG proposes an umbrella structure under which a dynamic ongoing program of action can be implemented. This umbrella structure, referred to as a CCWG Science Forum, is a platform for integration of the cooperative actions/projects that will catalyze outputs and outcomes. Regular (bi-annual) joint conferences involving U.S., Vietnam, and other scientists and practitioners are proposed under different thematic areas, starting first with the four priorities identified at the March 2010 CCWG Bilateral meeting.



Deputy Prime Minister Dr. Nguyen Thien Nhan and Vietnamese Delegation meeting with Climate Change Working Group members at the USGS Patuxent Wildlife Research Center on November 8, 2009

## Climate Change Impacts: Risks to People, Property, and Infrastructure

- Damage and displacement in coastal areas resulting from increased storm intensity and storm surge
- Increased flooding and landslides
- Crop failures due changes in temperature and precipitation
- Urban displacement resulting from sea level rise and increased flooding





**Related Web Sites:**

PWRC <http://www.pwrc.usgs.gov>

VIMHE <http://www.imh.ac.vn>

USGCRP <http://www.globalchange.gov/>

MONRE <http://www.monre.gov.vn>

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