



**Good Neighbor Environmental Board (GNEB)  
Meeting**

**Wyndham San Diego Bayside  
1355 N Harbor Drive  
San Diego, CA 92101**

**September 17–18, 2015**

**MEETING SUMMARY**

**Welcome and Introductions**

*Ann-Marie Gantner, Acting GNEB Designated Federal Officer (DFO), Office of Diversity, Advisory Committee Management and Outreach (ODACMO), U.S. Environmental Protection Agency (EPA); Paul Ganster, Chair, GNEB*

Ms. Ann-Marie Gantner, Acting GNEB DFO, welcomed the participants and thanked them for attending. She introduced Dr. Paul Ganster, Chair of the GNEB, who also thanked the participants for their attendance. The Board members then introduced themselves, as did the Board alternates, who are non-Board members supporting their organization's participation; EPA regional office contacts; Mr. Mark Joyce, Associate Director, ODACMO, EPA; speakers and panel members; and members of the public. A list of participants is included in Appendix A, and the meeting agenda is included in Appendix B.

**Global and Regional Climate Variability: The U.S.-Mexican Border Region**

*David Pierce, Scripps Institution of Oceanography*

Dr. Ganster introduced Dr. David Pierce, Scripps Institution of Oceanography, who provided an overview of the scientific evidence regarding global climate change and its impacts in the border region. Since 1880, the annual mean global land and ocean temperature has risen approximately 1.5°F, representing a long-term trend superimposed on natural variability. This same temperature anomaly can be seen in data extending to 800 A.D., in which other anomalies such as a warmer period during medieval times can be observed. Atmospheric carbon dioxide levels track surface temperature over the past 400,000 years, and the current carbon dioxide level of 400 ppm is above the range of natural variation estimated for the past 2 million years. The Intergovernmental Panel on Climate Change (IPCC) has estimated future global carbon dioxide emissions under high, medium and low emissions scenarios, and current carbon dioxide emissions are tracking above the high emission scenario.

Polls of public attitudes on climate change reveal a common misconception about the scientific consensus on global warming. Among climate change scientists, 97 percent believe that the Earth is warming and that this warming is caused by humans, but only 22 percent of the public is aware of this broad consensus. A comparison of the temperature anomaly to the energy received by the Earth from the sun from 1880 to the present reveals that global warming cannot be attributed to variations in the sun's energy. Despite this evidence, a large segment of the public does not believe that global warming is occurring. Several reasons for this misconception exist. The public has been misled by reports citing a portion of the data that has been "cherry picked" to contradict long-term trends that reveal the effects of global warming (e.g., sea level rise). Observations of the global temperature anomaly contain uncertainties, and the data become more uncertain further in the past. The rate of change in the global temperature anomaly during the last

50 years is somewhat lower than in the past century, but this difference is not statistically significant. Articles aimed at a target group that offer corrections to a false claim have been shown actually to increase false beliefs.

In the border region, global climate change will produce more extreme weather days, including drought, extreme heat and extremely low humidity. The summer will warm more than the winter, and the land will warm more than the oceans. Global warming in and of itself without a change in precipitation reduces runoff; for example, a 1°C warming is projected to decrease the flow of the Colorado River by 1 percent during the summer. Under the high emissions scenario, annual precipitation is projected to decrease 10 to 12 percent in the border region by 2070 to 2099. Although wet day frequency is projected to decrease, wet day intensity is projected to increase. Runoff, which represents usable water, is projected to decrease 2 to 2.5 times faster than precipitation. Cropland value will decrease according to a model that considers factors such as effects on soil, irrigation potential and distance to market. Sea level rise will affect the border populations that live on the coast. Sea level is projected to rise 3 to 5 feet by 2100. The ultimate sea level rise is projected to be 40 feet.

Three main factors contribute to uncertainty in climate models: the chaotic behavior of the weather, model uncertainty and uncertainty in the human response to climate change. Projecting further into the future, the uncertainty resulting from human response becomes dominant.

Dr. Pierce described projected impacts of global climate change on the border town of Mexicali. Extreme heat days (i.e., greater than 111°F) historically have averaged 4 per year but will increase enormously by 2100 to approximately 100. The number of warm nights (i.e., greater than 81°F), which are harder physiologically on the body, also will increase tremendously.

Climate changes both naturally and from human causes, but the current warming is from human activity. The temperature is rising already, and this change is observed in the border region in particular. Summer temperature likely will increase the most, and heat waves will be amplified. Water will be a key issue because hotter temperatures mean less runoff and less usable water; the likely decreases in precipitation of 10 percent will cause decreases of approximately 20 percent in runoff; and wet days will be fewer, but precipitation will be more intense, resulting in implications for water management. Other impacts include sea level rise, agricultural impacts, more wildfires and health implications.

### *Questions & Answers and Discussion*

Dr. Gabriela Muñoz Meléndez stated that in the Climate Action Plan for Baja California, climate scientists predicted that by 2100, average temperatures will increase by 2°F and precipitation will decrease by 20 to 35 percent; these changes will create problems with water and increase energy demand.

Dr. David Eaton asked about the physical mechanisms by which increases in temperature will decrease precipitation and decrease runoff to an even greater extent. Dr. Pierce responded that global warming is predicted to cause the dry subsidence zone, the area in which air that rises in the tropics comes down, to expand to the north, bringing a drier climate to the border region. The amplified decrease in runoff relative to the decrease in precipitation is caused by increased evapotranspiration by plants and evaporation of moisture from the soil. This effect does not consider possible large-scale changes in the ecosystem in response to climate change.

Dr. Keith Pezzoli commented that global warming, in addition to warming the land and ocean, will warm rivers, affecting fish populations. He highlighted the need for infrastructure to capture runoff better.

Dr. Teresa Pohlman commented that the Department of Homeland Security (DHS) is concerned about the movement of goods and people across the border. She noted that DHS also is very concerned about the environmental justice aspects of climate change, which are termed climate justice.

Ms. Laura Abram cited the drought currently affecting California. She asked whether an El Niño event is predicted and what the effect might be on the drought. Dr. Pierce responded that there currently is an El Niño event. The effects on precipitation in California are difficult to predict, however, because some past El Niño events have increased precipitation whereas others have decreased it.

Mr. Stephen Niemeyer inquired about uncertainties in the ability of the oceans to absorb carbon dioxide. Dr. Pierce replied that scientists are making progress in understanding the ocean's ability to absorb carbon dioxide, and uncertainties would change the slope of the atmospheric carbon dioxide curve, not the final amplitude. One process that climate models do not reflect is that as oceans absorb more carbon dioxide, they become saturated and less effective in taking up carbon dioxide.

Dr. Francisco Zamora Arroyo asked what the main impacts of climate change will be on agriculture. Dr. Pierce responded that although agriculture is not his area of expertise, extensive research has been done on the effects on crop yields. The decreased humidity and increased temperature are likely to be beneficial in the short term but have disastrous long-term effects.

In response to Mr. Luis Olmedo's inquiry about transporting water from one region to another, Dr. Pierce commented that widespread irrigation can decrease temperatures in a region. He noted that proposals to move water from one region to another have tended to produce strongly negative emotional responses from the public.

### **Panel on Climate Effects in the Border Region**

Dr. Ganster indicated that there would be time for short questions of clarification after each of the panel member's presentations. After all of the presentations, a discussion period would follow in which more in-depth questions could be asked of all of the panelists.

#### ***Climate Variability and Disease in the Border Region***

*Stanley Maloy, San Diego State University*

Dr. Ganster introduced Dr. Stanley Maloy, San Diego State University, who presented on the implications of climate variability on infectious disease in the border region. Dr. Maloy recognized that research on how people view change has revealed that many people are not worried about change that might affect the lives of their great grandchildren in 2050 or 2100. The effects of changes in carbon dioxide are being seen today, however, such as in the impacts on coral reefs, which negatively affect fisheries.

The border region is particularly vulnerable to the effects of climate variability on infectious disease because the border region is an arid ecosystem, biodiversity is high, the Pacific migratory bird pathway extends through the border region, the human population is highly mobile, and urban development is growing. Climate change will affect sewage runoff because more severe rain events will decrease the capture of sewage. Urban development is a challenge because rodents feed on human waste, concentrating pathogens that contaminate water.

Issues exist on both sides of the border that affect the Tijuana River estuary. Sewage runoff into the ocean increases the frequency of diseases, such as hepatitis. Antibiotic resistant pathogens have been found in the Tijuana River estuary.

The human population is very sensitive to emerging infectious diseases, some of which have not been seen before in humans and others that were thought to have been eliminated. Most emerging infectious diseases originate in animals. The incidence of emerging diseases is increasing because of human alteration of the environment, with climate change being a core issue; for many diseases, a change in temperature as small as 1°F determines whether they can grow. Alteration of the environment leads to a new disease by the following sequence of events: a reserve of pathogens exists; the environment is disrupted; new niches are created; animals are exposed; and, ultimately, humans are exposed. The health of the environment, animals and humans is closely associated with temperature and rainfall. For example, an increase in temperature can increase the population of insect vectors, such as ticks, and reduce biodiversity. An increase in ocean temperature can allow pathogens to grow. Changes in the water cycle, including floods and drought, affect rodent vectors, which carry such diseases as the hantavirus. Disease also is transmitted by aerosols.

One Border, One Health—a binational approach to infectious disease surveillance comprised of environmentalists, veterinarians and physicians—seeks to address the risks of emerging diseases. The approach of One Border, One Health is new because instead of reacting to a human disease outbreak, it involves surveilling the environment, predicting where disease might arise, and building upstream prevention measures (e.g., rodent control). The short- and long-term effects of climate change particularly impact poorer populations, making climate change an environmental justice issue.

#### *Questions & Answers*

Mr. Olmedo asked for more information about *Rickettsia*, which is carried by ticks and is thought to spread via the discharge of runoff into canals. Dr. Maloy stated that transmission is thought to occur from domestic animals to wild animals. The rodent population spreads the pathogen, and the population of rodents depends on the water cycle.

Dr. Eaton inquired whether there are empirical data on the effects of climate change on human health outcomes and whether there is evidence of a decrease in the rate of disease from environmental improvements in the border region. Dr. Maloy confirmed that data exist on the effects of climate change on human health, but he did not have sufficient time to share these data in his presentation. He stated that there is a strong correlation of human health with rainfall, runoff and temperature, but establishing causality can be difficult. In the laboratory, the effects of temperature on disease vectors, such as *Vibrio parahaemolyticus* and mosquitos, have been confirmed.

#### *Climate Change and Energy Issues*

*Alan Sweedler, San Diego State University*

Dr. Ganster introduced Dr. Alan Sweedler, San Diego State University, who discussed climate change and energy issues in the California-Baja California border region. Dr. Sweedler stated that the California-Baja California region is a dynamic area with a growing population, with the population on the Mexican side projected to exceed that on the U.S. side soon. The area depends almost entirely on energy and water from sources outside the region, and water and energy are inextricably linked. From an energy and water perspective, the region can be viewed as consisting of an eastern zone (i.e., Imperial County and the *municipio* of Mexicali) and a western zone (i.e., San Diego County and the *municipios* of Tijuana, Rosarito, Ensenada and Tecate), separated by a north-south mountain range.

The eastern and western zones of the California-Baja California region have different water and energy needs and resources. In the western zone, the power sector on the California side is dominated by imported natural gas, imported renewables and petroleum products in the transportation sector; power on the Baja California side is dominated by natural gas imported from the United States. The water supply on

the California side is mostly imported from sources that include the Colorado River and northern California; the water supply in Baja California comes almost entirely from the Colorado River via an aqueduct from the Mexicali region, pumped over the mountains at a high energy cost. In the eastern zone, power for the California side is derived from imported natural gas, local renewables and geothermal sources; transportation on both sides of the border is heavily dependent on petroleum products imported from outside the region. The water supply on both the California and Baja California sides comes mostly from the Colorado River. Because water in the California-Baja California region is almost entirely imported, requiring energy to import, a vulnerability is created.

The effects of climate change on the California-Baja California region will include increased average, maximum and minimum temperatures; increased number of days with temperatures greater than 100°F; decreased precipitation; increased drought; sea level rise; and increased occurrence and spread of infectious diseases. The implications are that climate change will decrease water supplies on both sides of the California-Baja California region; stress existing energy systems as a result of demographic shifts to inland regions, requiring more air conditioning and energy-intensive water supplies; and increase demand for energy, thereby increasing greenhouse gas (GHG) emissions from fossil fuel use.

Possible responses that the Board can consider are to recognize that supply and demand for both water and energy are inextricably linked; supply can be “increased” by decreasing demand; and demand can be reduced or managed by increasing energy efficiency, recycling water and wastewater, introducing the concept of “demand side management” into the water sector, creating a “smart grid” for water, and continuing growth of renewable energy resources. The ocean likely will be seen as a water source by the public, and more needs to be learned about desalination, which currently is the most expensive water source and has considerable negative effects, but the technology will become more efficient and environmental impacts might be mitigated. Desalination is part of San Diego County’s water supply diversification plan through 2020. Opportunities exist for cross-border cooperation sharing of energy and water (e.g., the desalination plant being discussed at the Rosarito site, which would provide a portion of its output for California; a joint canal to bring water from the Colorado River to the western zone of the region; large renewable energy products), but significant barriers exist, including differences in environmental standards and a history of distrust.

### ***Preparing for Climate Change in the San Diego-Tijuana Border Region***

*Emily Young, San Diego Foundation*

Dr. Ganster introduced Dr. Emily Young, San Diego Foundation, who shared the results of the recent report, *San Diego, 2050 Is Calling*, on what science is telling the public about climate change and how science can be used to inform decision making. Climate change is an issue that is affecting the public now and will affect future generations even more. The residents of the San Diego region take great pride in their history of protecting the environment and fostering innovation. The Climate Education Partners, which produced the report, is a collaboration that was funded by the National Science Foundation and includes social scientists, researchers and local decision makers.

Localized, granular information is needed to determine localized projections of climate change. The report focused on impacts. With better models, scientists can model rainfall effects of climate change, predicting 16 percent fewer rainy days in the region and 8 percent more rain falling during the biggest rainstorms. Wildfires will be a big issue, with a more extended fire season, sprawling urban growth that increases vulnerability to fires, and topography that creates conditions that favor fires. Most of the region’s water comes from the Colorado River, and it is projected that supplies will decrease by about 12 percent while population growth will increase water demand by 46 percent. Large amounts of infrastructure will be devoted to water storage, and construction of desalination plants is a possibility. Because of warming temperatures, seven times as many days of extreme heat compared to current rates

are expected by 2050. High nighttime temperatures will result in heat stress. The frequency and extent of coastal flooding will increase because sea levels will be 12 to 18 inches higher by 2050. The 100-year flood of today might be the annual flood of 2050. Coastal flooding already is an issue today (e.g., the king tide in La Jolla). Flooding will be more of a problem in large rivers as well as along the coasts.

Citizens in the San Diego region are more concerned about climate change than the average U.S. citizen. Eight out of 10 San Diego region residents are concerned or very concerned about climate change and its impact on the San Diego region. Nine out of 10 Californians are very concerned about water, which presents a great opportunity to mobilize on the issue. Citizens in the San Diego region desire greater leadership on the climate change issue and want to reduce GHG emissions. Among business leaders, 9 out of 10 are concerned about climate change. Only 1 in 10 San Diego residents, however, believe that their peers are concerned about climate change. If people do not feel that they are part of a peer community, it is harder to act on an issue.

There are many opportunities at the state and local levels to plan for climate change. For example, Chula Vista is a leading city in adapting to climate change. Most planning is based on the demand rather than the supply side. Businesses are promoting smart growth in cities to conserve energy and water. For example, the San Diego Convention Center is a green building, reducing energy and water use at conventions hosted there. San Diego County is a leader in sustainability and climate change adaptation.

### ***Climate Change Strategies for Baja California and Mexico***

*Gabriela Muñoz Meléndez, El Colegio de la Frontera Norte*

Dr. Ganster introduced Dr. Muñoz, El Colegio de la Frontera Norte, who provided an overview of climate strategies for Baja California and Mexico. Mexico has been very proactive in its approach to climate change, having signed the Climate Change Framework Convention in 1992 and signed and ratified the Kyoto Protocol in 1998 and 2000, respectively. The current administration, however, approved Mexican Energy Reform, which opened the country's petroleum reserves to private investment, and delayed the issuance of the Energy Transition Law. Treaties and agreements signed previously commit Mexico to communicating with the United Nations Federal Commission on Climate Change, creating such institutions as the Mexican Interdepartmental Commission on Climate Change, and developing regional programs of climate action. By 2010, each of Mexico's 31 states and one federal district had developed a Regional Climate Change Act (*Programa Estatal de Acción Ante el Cambio Climático* or PEACC), and by 2011, nearly 50 municipalities were developing Climate Change Acts at the municipal level. The main objective of these state and local Climate Change Acts is to characterize and minimize local and regional vulnerabilities, enhance adaptation, identify sources of GHGs, and implement mitigation and adaptation strategies. Municipalities that have developed Climate Change Acts are located throughout Mexico, including Tijuana, with Oaxaca being the most active state.

In 2008, Baja California took the first steps toward a PEACC, with three regional academic institutions providing local expertise. The main elements of the Baja California PEACC were the following: (1) develop state-level GHG emissions inventories and conduct scenarios forecasting; (2) develop regionalized climate scenarios; (3) analyze impact, vulnerability and adaptation measures; (4) develop proposals for mitigation and adaptation measures, as well as for GHG emissions reduction; and (5) distribute responsibilities among agencies. The recommendations developed in technical reports were subjected to technical and governmental review and cross-referenced with governmental programs, resulting in 14 final recommendations in areas that included energy, urban solid waste, agriculture and livestock, water, urban infrastructure, and land use and change of land use. The recommendations comprised a mitigation plan (with recommendations in the areas of energy, waste, agriculture, livestock and land use) and an adaptation plan (with recommendations in the areas of water and urban

infrastructure). The two centers of Tijuana and Mexicali were targeted, and increasing irrigation efficiency and instituting a water use fee are two examples of water recommendations.

Because current development patterns are the underlying cause of climate change, climate change needs to be recognized as a development problem rather than solely an environmental problem. Regional or state-level PEACCs are instruments to mobilize resources, including political will and social pressure, to accomplish mitigation and adaptation objectives. Evidence suggests that the most effective mitigation and adaptation measures are those implemented at the local and regional levels. Approaches to dealing with climate change issues differ widely between Mexico and the United States, and can be expected to vary among the U.S. states as they do among Mexican states. Although a unified approach will not be possible, it is necessary to identify ways in which the United States and Mexico can cooperate.

### ***Questions & Answers and Discussion***

Mr. Jonathan Andrew asked whether there are positive effects of climate change. Dr. Muñoz answered that new fisheries will develop in places that will be flooded because of sea level rise. Dr. Maloy added that increased levels of atmospheric carbon dioxide will enhance plant growth; this only will be true for certain plants, however, and increased carbon dioxide also might increase the growth and survival of pests that consume plants. Dr. Pezzoli added that as plants adapt to increased carbon dioxide by decreasing the number of breathing pores, they become more susceptible to heat waves. Dr. Sweedler predicted that another possible positive effect of climate change might be the necessary development of new technologies, as already has been seen in the electricity sector and new economic sectors. Dr. Young commented that there will be greater pursuit of integration of local planning efforts, as has been seen in the San Diego area, where the city of San Diego, the San Diego airport and local municipalities are collaborating to develop a strategy on flooding. The San Diego Regional Climate Collaborative is a collaboration of multiple stakeholders to facilitate climate change planning. She observed that collaboration will be needed to address water issues because conservation requires multiple strategies, including stormwater management and recycling gray water.

Ms. Beverly Mather-Marcus mentioned that in addition to new pathogens emerging because of increasing temperatures, other pathogens that are viable at current temperatures might not be able to survive higher temperatures. Dr. Maloy responded that mosquito populations in the tropics might decrease.

Ms. Mather-Marcus also asked about the status of implementation of Climate Action Plans. Dr. Muñoz replied that a trolley system has been built in Tijuana. In addition, many infrastructure changes related to water have been made, with more planned.

Mr. Olmedo stated that it will be necessary to engage farmers in planning for climate change in agriculture. Dr. Muñoz replied that a program was established in the Mexicali Valley to provide incentives to farmers not to burn waste, but implementing the program has not been very successful.

Mr. Olmedo commented that tsunamis and coastal flooding might become a greater concern because of global climate change. Dr. Sweedler noted that different stakeholders (e.g., real estate investors) might be expected to have different vested interests in recognizing increased coastal flooding as a possible effect of global warming.

Mr. Olmedo inquired whether the economic burden is passed on to the water utility when conservation measures are implemented. Dr. Sweedler acknowledged that water utilities have fixed costs; therefore, incentives are needed for the upkeep of infrastructure and implementation of conservation measures. Otherwise, under the current business model, it is in the utilities' best interests to sell as much water as possible. Currently, fees are used to fund improvements and upgrades. Dr. Jeffrey Payne agreed that

water is an economic issue. He pointed out that improved recycling of water also will be necessary to prevent damage to natural systems, which could lead to species survival issues, including endangered species. Dr. Young cited installation of green infrastructure in cities—including planting shade trees, restoring rivers and filtering stormwater—as measures that will help water conservation. She added that coordination will be needed between water resources control boards and water utilities. Dr. Sweedler noted that water conservation measures might require modifications to existing systems, such as flushing wastewater pipes because of reduced flows.

Mr. Olmedo asked how much energy desalination uses and whether the benefits of the technology depend on the source of energy. Dr. Sweedler responded that desalination of seawater is likely to be a technology of last resort; the first approaches to finding new water sources likely will be wastewater recycling and use of brackish water. Dr. Sweedler predicted, however, that necessity will spur the development of new, lower cost desalination technologies and new approaches to dealing with the environmental issues associated with desalination.

Regarding cross-border collaboration on climate change initiatives, Mr. Olmedo suggested that there might be concerns because of differences in environmental regulations.

Dr. Pohlman stated that Executive Order (EO) 13,693, Planning for Federal Sustainability in the Next Decade,<sup>1</sup> requires all of the U.S. federal agencies to install and monitor advanced energy meters and water meters. To support conservation efforts, these meters will require analysis of the data that they will generate. Dr. Pohlman asked whether life cycle cost analyses for installing meters and data systems, as well as for other climate change infrastructure projects, have been performed. Dr. Sweedler replied that some buildings have no meters at all or only recently installed meters in the face of significant opposition. Regarding cost analyses, he observed that initial capital costs will be offset over time as the cost of the commodity increases, but he acknowledged that the responsibility for paying the initial costs can be an issue. He predicted water service companies (WASCOs), the water equivalent of energy service companies (ESCOs), will be created. Dr. Sweedler noted that a large number of life cycle studies exist for energy conservation measures, but he did not know if the same was true for water conservation measures. Dr. Young added that a municipality had used the cost savings from installing high-efficiency light-emitting diode (LED) bulbs in streetlights to fund the salary of a sustainability manager.

Dr. Pezzoli inquired about translating the value of biodiversity into health policy. Dr. Maloy responded that biodiversity helps protect humans from infectious diseases by providing alternative hosts for pathogens.

Dr. Pezzoli asked for clarification on how climate change adaptation can be thought of as a development issue (e.g., creation of local jobs, protection of livelihoods). Dr. Muñoz replied that successful climate change adaptation in Mexico depends on it being considered a development issue.

Mr. John Parada asked whether there have been studies predicting the future intensity of high pressure systems, which dry vegetation and provide fuel for wildfires. Dr. Young commented that tribal reservations are especially vulnerable to wildfires. Dr. Pierce responded that studies have shown an increase in the proportion of warm, high-pressure systems.

Mr. Parada inquired whether sustainability analysis studies have been performed on aquifers in the border region. He noted the decrease in surface water levels as wells are used to tap ground water sources. Dr. Pierce responded that in a recent drought in Australia, which lacks laws governing ground water use,

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<sup>1</sup> Exec. Order No. 13,693, 80 *Fed. Reg.* 15871 (Mar. 25, 2015).



negative effects were seen from wells drawing on ground water sources. In general, regulations have lagged behind the science that predicts the negative effects of depleting aquifers.

Dr. Ganster thanked the panelists for their presentations and contributions to the discussion. He observed that the information provided by the panelists will be very helpful in suggesting ideas to include in the Board's advice letter.

### **Public Comments**

Representatives from the Tijuana River National Estuarine Research Reserve, Ms. Dani Boudreau and Ms. Ana Eguiarte, provided public comments. Ms. Boudreau stated that the issue of climate change and adaptation unites people across borders. Ms. Eguiarte emphasized the need to speak the same language, agree on goals and have access to the same information. Opportunities to share information at the local and national government levels are needed.

Ms. Barbara Maco, Wactor & Wick LLP, stated that disaster preparedness is a key part of community resiliency. In addition, she spoke about the role of contaminated sites in climate resilience. The World Bank stated that contaminated sites are a resource in climate resilience. EPA has shown that cleaning up contaminated sites enhances real estate values. The United Kingdom Land Trust has cleaned up brownfields for use in the defense against floods. Ms. Maco asked that the Board consider rehabilitating impaired land as part of a climate resilience strategy.

### **Border Environment Cooperation Commission (BECC) Green Infrastructure Initiative and Other Climate-Related Projects**

*Maria Elena Giner, BECC*

Ms. Maria Elena Giner, BECC, provided an introduction to the BECC and North American Development Bank (NADB), a summary of BECC/NADB accomplishments, and a survey of BECC/NADB climate change initiatives. The BECC and NADB were created in a side agreement to the North American Free Trade Agreement (NAFTA) to develop, implement and oversee environmental infrastructure projects. Projects are certified by BECC and financed by NADB. The jurisdiction of the two institutions extends 100 km north and 300 km south of the U.S.-Mexico border, and its mandate encompasses the basic sectors of water pollution, wastewater treatment, water conservation, municipal solid waste, industrial and hazardous waste, and recycling and waste reduction, as well as the expanded sectors of air quality, clean and efficient energy, public transportation, municipal planning and development, international border crossings, energy transmission and distribution, production of goods and services to enhance or protect the environment, and other infrastructure designed to minimize future negative environmental impacts.

The BECC and NADB provide loans and grants to support projects related to the institutions' mandate, as well as training to build institutional capacity. As of September 2015, the BECC/NADB had certified 253 projects with a total investment of \$9 billion, and BECC had provided \$50 million in technical assistance. The social and environmental benefits of the work of the BECC/NADB are measurable; metrics include gallons of untreated or inadequately treated sewage eliminated (462 million gallons per day [MGD]); water savings (330 MGD); improved waste collection and disposal services (1,550 tons of waste per day); reduced exposure to air pollutants (170,000 tons per year of particulate matter up to 10 µm in size [PM<sub>10</sub>]); and reduction of carbon dioxide generated (2.47 million metric tons per year). Ninety-two percent of the population in the border region now has adequate wastewater treatment. Through financing of renewable energy, the BECC/NADB has created 1,600 megawatts (MW) of new renewable energy capacity, the equivalent of the emissions from 500,000 passenger vehicles.

The BECC/NADB has catalyzed numerous climate change initiatives in Mexico, where there is a climate change law in which renewable energy plans play an important role. A GHG inventory for all six of the Mexican border states has been completed after standardizing the approach with that of the United States. The GHG emissions in all six of the Mexican border states are disproportionately large compared to the rest of the Mexican population, with electricity and transportation being the major sources of GHG emissions. Five of the six Mexican border states are developing Climate Action Plans. The BECC/NADB also completed energy and water audits for utilities. In 2015, the BECC/NADB has been focusing on implementing the recommendations of those audits that are feasible, funding them through mechanisms that include the utility's budget, grants and loans.

The BECC/NADB also has recognized that green infrastructure will play a key role in climate change resilience. Paving and urbanization have led to flooding from problems with stormwater management and decreased air quality from erosion. Green infrastructure is a subset of environmental technology "green" strategies that uses plants and soil to provide a public service. EPA has developed many tools to assist in implementing green infrastructure projects. Examples of green infrastructure projects in the border region include curbs, curb cuts, medians and roundabouts in Las Cruces, New Mexico; El Paso, Texas; and Tucson, Arizona. Channelized riverbeds have been dechannelized. In addition to environmental benefits, green infrastructure provides social benefits, including promoting physical and mental health, improving community health, connecting people with nature and improving quality of life. Economic benefits include increased property values, medical and public health cost savings, and reduced rainwater management costs. In 2014 and 2015, two green infrastructure forums were held, one in Ciudad Juárez, Chihuahua, Mexico, and one in Tucson, Arizona, in which EPA was a major participant. Strategic actions that need to be taken to implement successful efforts include incorporating best practices in construction techniques, developing a legal framework for investment, educating the public about the benefits of green infrastructure and using plants that are native to the region. The BECC/NADB approach in the next 12 months will include planning (i.e., urban planning and developing master plans that combine green and gray infrastructure); developing a portfolio of projects (i.e., identifying projects, redesigning existing projects and showing cost savings); building capacity through technical training and conducting another forum on green infrastructure; and reviewing codes and laws to facilitate green infrastructure projects. The BECC has written materials, presentations and videos available through its website that provide more information about green infrastructure. Ms. Giner distributed pamphlets to the Board members describing some of the BECC/NADB projects related to climate change resilience in the border region.

### *Questions & Answers*

Dr. Payne inquired about the benefits versus the costs of hybrid green-gray infrastructure, particularly the longer range costs and longevity. Ms. Giner replied that a Philadelphia, Pennsylvania, conference had provided ideas about hybrid infrastructure, and the BECC/NADB is developing cost reduction estimates for installing green versus concrete curbs. The costs of flooding need to be considered as well. The goal of the BECC/NADB is to work with the U.S. Federal Emergency Management Agency (FEMA) and Mexico's equivalent agency, viewing green infrastructure as an investment opportunity.

Dr. Zamora observed that in Mexicali, hundreds of kilometers of drains have been constructed. Ms. Giner responded that the BECC/NADB is focusing on medians and curbs. She mentioned two examples of green infrastructure improvements of waterways: (1) in Los Angeles, California, cement is being removed from the Los Angeles River and (2) a streambed was dechannelized on the University of Arizona campus.

Mr. Olmedo asked about green infrastructure plans of the BECC/NADB in desert areas. Dr. Giner replied that the BECC/NADB's green infrastructure plans are applicable to rural areas. Mr. Olmedo suggested that the BECC/NADB include rural areas explicitly in its green infrastructure goals.

Dr. Pezzoli stated that San Diego is fostering infill development. Where stormwater runoff requirements cannot be met onsite in these developments, offsite vacant land is being considered to meet the requirements. Ms. Giner responded that most of the BECC/NADB projects involve redesigning paving projects. The BECC/NADB also is considering such public areas as parks but is not targeting vacant lots.

Ms. Sylvia Grijalva inquired whether state departments of transportation (DOTs) are adopting any standards for green infrastructure. She observed that funding from the federal DOT is distributed to local DOTs. The creation of state standards for green infrastructure would eliminate the need to create new designs with each project.

Ms. Grijalva asked what measures are taken to ensure that green infrastructure measures will not cause local flooding. Inadequate flood control designs can lead to lawsuits if flooding occurs, as was the case for a highway in Phoenix, Arizona. Ms. Giner replied that the BECC/NADB plans to construct a whole watershed model for a medium-sized city to determine methodology. She added that these measures have been proven effective in locations outside of the border region that receive rain regularly.

Dr. Muñoz asked Ms. Giner's opinion about the Arroyo Alamar project. Ms. Giner responded that the BECC/NADB had shared a white paper on the project with the National Water Commission. The project is an opportunity for EPA and Mexico's Comisión Nacional del Agua (Conagua) to establish a dialog.

Dr. Pohlman observed that EO 13,693, which goes into effect in fiscal year 2016, provides significant guidance on sustainability and green infrastructure. She cited the General Services Administration (GSA), which has an Office of Sustainability, and the Coast Guard, which has jurisdiction over bridges over navigable rivers and performs rescue operations, as possible collaborators for the BECC/NADB. Ms. Giner replied that the BECC/NADB works primarily with EPA, but is open to collaborating with other stakeholders.

Ms. Abram asked about possible collaborations with green infrastructure projects in the private sector, such as the installation of living roofs. Ms. Giner responded that the BECC/NADB works primarily with municipalities but would be interested in how such private initiatives are funded; she indicated that they might be eligible for funding as a BECC/NADB project. Ms. Giner cited a facility that planted grass on its roof and was able to reduce cooling costs significantly.

Dr. Payne suggested partnering with the reinsurance industry, which might be interested in investing in green infrastructure as a mechanism for reducing losses from flooding.

Mr. Tomas Torres noted that California recently passed legislation regulating stormwater runoff from industrial properties, and many industries are installing green infrastructure on their properties to receive waivers from the new regulations. Mr. Torres also observed that green infrastructure can be used to protect natural areas as well, such as arroyos.

Ms. Giner invited the attendees to participate in the upcoming Border Energy Forum XXII, scheduled for October 14–16, 2015, in San Diego, California.

### **Discussion of the Advice Letter and the 17th Report to the President on Climate Change Resilience in the U.S.-Mexico Border Region**

Mr. Joyce provided background on the Board's charge. The White House Council on Environmental Quality (CEQ) had asked the Board to consider the topic of climate change resilience. Ms. Gantner and Mr. Joyce met with the CEQ, and it was suggested that the Board's advice to the President and Congress be structured around the following three major areas:

- (1) A detailed assessment of the effects that have occurred from climate change.
- (2) Steps and approaches to mitigate and address these changes (e.g., water conservation, increased use of renewable energy).
- (3) Recommendations to the President and federal government on what the federal government should be doing with regard to climate change in concert with its state, local and tribal partners.

Mr. Joyce noted that federal agencies have data to which the Board can have access; for example, the National Aeronautics and Space Administration (NASA) offered to provide the Board with data on soil moisture and vegetation.

Mr. Joyce suggested that the current Board use the same approach to providing its advice as previous Boards had taken. Between now and the end of December, the Board would draft and approve an advice letter that would highlight its major recommendations. Ms. Gantner proposed that the advice letter be 10 to 20 pages in length, which is consistent with the length of previous advice letters. Mr. Joyce stated that in 2016, the Board would produce a full report.

Mr. Joyce reminded the Board of the procedures that govern GNEB meetings and activities. Any time the Board meets to approve an advice letter or a report, it must be done in an open, public meeting. The Board must achieve a quorum to approve an advice letter or a report. All Board meetings must be announced in the *Federal Register* 15 days in advance of the meeting. The Board generally forms workgroups, which can work independently on sections of the advice letter and report. Because of the regulations promulgated in the Federal Advisory Committee Act (FACA), all workgroups must be comprised of less than one-half of the Board members (less than a quorum). Mr. Joyce indicated that the Board discusses the advice letters and reports in public meetings conducted either face-to-face, generally once per year, or via teleconference.

The Board members who had served during the production of previous advice letters and reports gave their impressions of the process. Dr. Pezzoli mentioned that, for a previous GNEB report, a workgroup comprised of five people focused on the definition of ecological restoration. The workgroups, like the Board, operate by achieving consensus. Mr. Stephen Niemeyer added that developing an advice letter or report is a group process and that the degree of participation of Board members can vary. Dr. Pezzoli commented that teleconference meetings are combined with a webinar, which allows the Board members to vote and view presentations virtually.

Some of the new members asked for clarification about the process by which the Board operates. Ms. Abram asked whether there is an individual who facilitates the Board's discussions, and Mr. Joyce responded that the Chair and sometimes EPA staff would attempt to resolve conflicts that might arise. If there is text that one or more Board members object to, often a change in wording resolves the issue, and if not, the Board generally decides to omit the objectionable text. Occasionally, consultation with the Agency's legal staff is required. Mr. Russell Frisbie asked about the extent that the provisions of FACA allows the Board to consider transboundary measures. Mr. Joyce replied that the statutory language establishing the Board states that the GNEB shall provide advice to the President and Congress for the betterment of citizens living on the U.S. side of the border. The Board members need not feel constrained from advising that the federal government to collaborate with entities south of the border.

Mr. Joyce discussed the timeline for the advice letter. By the end of the current meeting, the Board should be clear on the major points to include in the advice letter; there also should be a timetable for completing the letter, and the individuals responsible for drafting different parts of the letter should be identified. Dr. Ganster added that October 8 is the deadline for completing the drafts of all of the sections of the

advice letter. Given that the advice letter must be transmitted to the CEQ by the end of the calendar year, Mr. Joyce suggested that the Board meet again in early December to approve the advice letter. Prior to the December meeting, the Board members will receive a copy of the draft letter so it can be reviewed by their constituencies. Ms. Gantner emphasized Board members should contact her in advance of the December meeting if they have any significant issues with the content of the advice letter. Mr. Joyce stated that after the Board discusses and approves the advice letter, all changes noted when it was approved by the Board will be incorporated; then, the advice letter will be copyedited. Dr. Pohlman raised the possibility that federal government employees might be furloughed if there is a government shutdown. Mr. Joyce responded that regardless of a shutdown, statute requires the Board to report annually to the President.

The Board members discussed the role of federal members. Ms. Grijalva stated that federal members generally recuse themselves from the recommendations in the advice letters and reports. There is a disclaimer included in each advice letter and report stating that the federal members recuse themselves from developing and endorsing the recommendations. Mr. Joyce added that even though the Board members representing federal agencies do not develop recommendations, they play a key role on the Board because they provide the most updated and current information about federal activities associated with the letter/report topic.

Dr. Ganster suggested that the Board start its discussion with general comments. The morning's discussion and presentations could provide a basis for identifying the key effects of climate change in the border region. He recognized that the Board members also likely had begun formulating possible recommendations. He stated that he had collaborated several years ago with Dr. Margaret Wilder on a chapter on climate change in the southwest and that Dr. David Eaton had suggestions on the approach that the Board could take to draft the advice letter.

Mr. Niemeyer commented that the state of Texas uses the term "climate variability," not "climate change."

Current activities of federal agencies to foster climate change resilience were discussed. Dr. Pohlman stated that under EO 13,693, each federal agency is required to prepare a Strategic Sustainability Performance Plan that will identify and address projected impacts of climate change. Regarding other current federal actions relevant to climate change, FEMA has developed building codes for buildings in danger of "storm attack" under its Resilience STAR certification program. Federal agencies also have been charged in EO 13,693 with gathering and processing data from advanced electrical meters using data infrastructure. These data can be used to calculate the return on investment of infrastructure changes to manage energy demand. Restoration of natural infrastructure, such as restoring wetlands for flood control, is another type of action being taken by federal agencies to increase resilience.

The Board discussed the relevance of environmental justice to climate change. Dr. Pohlman suggested that with regard to environmental justice, there might be synergies between the recommendations of the Board and EPA's National Environmental Justice Advisory Council (NEJAC).

How to present the effects of climate change in the border region in the letter was discussed by the Board. The following current and future effects of climate change in the border region were highlighted by Board members:

- Dr. Wilder emphasized the need to talk explicitly about climate extremes, including heat, flooding and cascading effects.

- The Board discussed the identification of vulnerable populations in the border region. Populations at particular risk include low-income communities, especially low-income communities of color, and tribal communities, which are vulnerable because of a lack of infrastructure and access to water. The following vulnerable populations also might be considered: children, the elderly, people with asthma and people with impaired immune systems. Tools such as EJ Screen can be used to identify vulnerable populations.
- Mr. Andrew observed that climate change affects biological diversity along the border, particularly aquatic resources.
- Mr. Andrew also commented that climate change affects public lands and the people who use them. Monitoring by the U.S. Geological Survey might be helpful in determining these effects.
- Dr. Payne indicated that climate change will have near-term (e.g., flood control, stormwater management) and long-term (e.g., water security) impacts on water.
- Ms. Abram cited effects on soil moisture.
- Dr. Pezzoli suggested discussing effects on the water-energy nexus.
- Dr. Pohlman stated that climate change will affect the movement of goods and people in the border region.

The Board discussed steps to mitigate and address the effects of climate change. Dr. Pezzoli suggested including steps for adaptation and resilience (i.e., proactive interventions) as well as mitigation (i.e., reducing production of GHGs). The following were suggested as examples of steps to mitigate, adapt to and/or increase resilience to the effects of climate change:

- Ms. Mariel Nanasi cited the Sol not Coal campaign, which solarized fire stations in New Mexico and used the savings in electricity costs to buy more fire safety equipment. The campaign is an example of a return on an investment in resiliency. When such solar projects are completed, they are celebrated as community events with food and music.
- Dr. Payne suggested that best practices for adaptation that have been adopted by indigenous cultures should be considered. The description of best practices could include those of cultures outside of the border region.
- Ms. Abram noted that water use for power generation decreases significantly when photovoltaic cells are used.
- Ms. Abram also pointed out that the use of renewable energy sources decreases carbon dioxide generation. Mr. Niemeyer noted that Texas is the leader in wind power generation in the United States.
- Mr. Niemeyer stated that energy conservation measures should be included in the report. He mentioned that EO 13,693 mandates that federal agencies increase the energy efficiency of their vehicles. Common sense measures to increase energy efficiency include encouraging ecodriving and imposing a no idling rule.

Dr. Pohlman suggested including near (current), mid-term (5 to 10 years in the future) and long-term (50 to 100 years in the future) recommendations in the advice letter. Ms. Grijalva proposed documenting

the cost savings associated with each recommendation to provide incentives for the federal agencies to act. She also emphasized the need for specificity in the recommendations. The Board members made the following suggestions for recommendations to consider including in the advice letter:

- Ms. Elizabeth Pozzebon stated that public health is connected to ecological health and suggested that the Board recommend funding efforts to study this connection. Vectors are changing, as has been observed in surveillance being performed in San Diego.
- Ms. Nanasi suggested that a competition could be held to provide an incentive for conducting GHG inventories, as municipalities in Mexico have done. From the competition, a database of best practices could be created.
- Ms. Pozzebon proposed that the Board include cooperative transboundary strategies and measures, as well as infrastructure solutions, particularly with regard to water and wastewater management.
- Ms. Abram noted that there is a problem with communicating facts about climate change to the public. She suggested recommending a public information campaign as a way to foster changes in behavior.
- There was support for fostering cross-border collaboration, including the recommendation that federal agencies engage their Mexican counterparts. Mr. Niemeyer suggested that mechanisms be established to inform Mexico of U.S. decisions that might have cross-border effects.
- Mr. Olmedo proposed providing technical support to disadvantaged communities.
- Mr. Niemeyer stated that when a crisis occurs, it is necessary to have protocols in place. Therefore, systems can be put in place to react to the likelihood that there will be more wildfires.

The Board discussed how to structure the advice letter, as well as ideas for content to be included. Ms. Mather-Marcus proposed having broad categories (e.g., water, energy) with common subcategories (e.g., vulnerable populations, communication). She also supported including recommendations for near-, mid- and long-term actions. Dr. Pohlman suggested that the goals presented by the President in response to climate change, which are presented on the White House website ([www.whitehouse.gov](http://www.whitehouse.gov)), might be a source of ideas for the advice letter.

For the report, the Board discussed how to format and present material in the report and the types of content to include. Dr. Ganster noted that text boxes with cases studies are an effective way of communicating possibilities. Ms. Abram suggested that maps, some of which the Board might need to generate itself, are a valuable way to convey information. Dr. Pezzoli agreed that mapping is effective but noted that the Board was not charged with performing original research. He proposed including suggestions for how the federal agencies can measure, monitor and evaluate their actions to address climate change. He also suggested including a glossary of key terms (e.g., GHGs, climate extreme, climate change, resilience, global warming, green infrastructure, climate vulnerability). Dr. Payne proposed that the report include information about grant opportunities, as had been discussed for the report on ecological restoration.

Dr. Wilder shared with the Board a draft outline for the advice letter that she had prepared based on the structure of the previous Board's advice letter. She noted that it will be a challenge to write concisely. One constraint to consider in preparing the advice letter is that it should be written with a specific audience in mind: the federal government. She emphasized that the Board will need to clearly explain the

relevance of the advice offered in the letter. Dr. Wilder's proposed structure for the advice letter was as follows:

- A salutation to the President.
- An introduction to the charge that also introduces central themes.
- Identification of the top 10 to 15 issues for immediate action.
- A presentation of the context of the border region (i.e., why the border region is a "hot spot" for climate change), including a general overview, a brief discussion of adaptation and resilience that includes a discussion of vulnerability related to adaptive capacity, a discussion of diversity in the border region, a discussion of the asymmetry in development in Mexico versus the United States, and a treatment of the interdependence of the U.S. and Mexican sides of the border region.
- Definitions of terms (e.g., vulnerability, adaptive capacity, resilience). IPCC definitions should be used to the extent possible because of their broad acceptance in scientific and policy circles.
- A concise summation of the impacts and biophysical changes predicted to occur as a result of global climate change.
- A discussion of major challenges to building climate resilience in the border region, including high poverty rates, cultural and linguistic diversity, heat extremes, drought, the spread of pests, and border security and habitat fragmentation.
- A list of three thematic problem areas in which the federal government plays a role and recommendations associated with them. Recommendations need to address adaptive strategies and mitigation.

Dr. Eaton offered his recommended approach to structuring the advice letter. He proposed that the Board concentrate on drafting a narrative. The narrative would begin with key recommendations. It would continue with the risks to climate resilience. It would answer the question of what is being done and what could be done to address climate change. The advice letter then would address the barriers to performing these actions. The letter also would include recommendations and implementation strategies, as well as a list of keywords and terms. He suggested that the Board write a first draft of the letter during the second day of the current meeting. The representatives of the federal agencies could be queried about what they currently are doing to address climate change and what they would like to do.

The Board members provided their feedback on the two proposals. Dr. Ganster observed that Dr. Wilder's outline and Dr. Eaton's narrative approach were not inconsistent. Regarding Dr. Wilder's outline, Dr. Pohlman discouraged inclusion of too detailed a treatment of the science of climate change; scientific literature on the effects of climate change could be referenced instead. In defining terms, she suggested harmonizing definitions with those used by the White House. She also emphasized the importance of offering concrete recommendations that focus on the border region and including a discussion of the return on investment. Ms. Nanasi suggested including a recommendation to remediate brownfields as sites for solar power generation. Ms. Abram supported this use of brownfields but observed that they need to be located near transmission lines. Dr. Payne proposed including a survey of existing mechanisms to assist climate change resilience activities. He added that the Board should discuss indicators of success that can be used to document progress of communities toward becoming more resilient to climate change.



Dr. Wilder offered to redraft the outline, including the recommendations that the Board members had proposed. She suggested structuring the advice letter by categorizing recommendations as near, mid and long term. The Board needs to decide on four or five areas into which recommendations and challenges could be classified. If the workgroups can draft material as bulleted lists, a writing group could produce text from the lists. Dr. Eaton suggested that the formal presentations in the morning session would be a good source of risks and barriers; the Board only would need to draft recommendations.

Ms. Lisa LaRocque proposed that to create continuity in the advice letter, the Board use a “jigsaw” approach, with groups brainstorming problems, best practices and recommendations for each area (e.g., water). After brainstorming, all of the members who worked on problems, best practices, recommendations, and so forth, could meet.

The Board members discussed thematic areas. Ms. Abram proposed water, energy and health. Dr. Pohlman added commerce, including migration of people across the border; infrastructure; and communication, which would be applicable especially to vulnerable populations. Dr. Pezzoli cited work sponsored by the National Science Foundation on the food-water-energy “trilemma.” He proposed adding food as a theme, given the likely significant impacts of climate change on agriculture. Ms. Pozzebon observed that water should include wastewater. Dr. Payne advocated for including the natural environment and resources, which are the sources of ecosystem services such as food security. Dr. Wilder suggested naming the theme “ecosystems,” “biodiversity” or “plants and animals.” Mr. Salvador Salinas proposed thinking more generally in terms of ecosystem sustainability. Dr. Zamora commented that emergency planning would fall under the theme of health. Mr. Scott Storment suggested that water would be part of infrastructure. He emphasized the importance of discussing green infrastructure. Dr. Rebecca Palacios stated that water is an overarching theme to which the other themes of energy, food, ecosystems and infrastructure are linked. Dr. Wilder listed the following themes as having general support from the Board:

- Water, including the water-food-energy nexus
- Energy, including the water-energy nexus
- Health, including emergency preparedness
- Ecosystems
- Commerce

The elements that the Board would consider within each theme were discussed. Dr. Pohlman suggested examining technical, social and economic effects. Dr. Wilder proposed considering vulnerable populations. Mr. Parada stated that tribal populations in particular are vulnerable, having nowhere to migrate to avoid the effects of climate change. The movement of goods and people was proposed by Ms. Mather-Marcus as being unique to the border region. Mr. Jeremy Bauer suggested capacity building and training. He highlighted such ongoing efforts in the border region as EPA’s program of training *promotores*. Dr. Wilder suggested that each thematic group cover the uniqueness of the border region, communication and education, vulnerable populations, green infrastructure, and economic impacts. In addition, each theme would have associated with it key challenges; near-, mid- and long-term recommendations; and indicators of success.

Dr. Eaton emphasized the need to develop a narrative. He proposed that the Board spend the second day of the meeting writing a draft advice letter.

## **Adjournment for the Day**

Mr. Joyce thanked the Board members for their efforts. He indicated that when the meeting continued on the next day, the Board members would need to confirm a date for the December teleconference during which approval of the advice letter would be considered. Considering the ambitious timeline for producing the advice letter, the Board also would need to decide on the delegation of tasks and interim deadlines. Mr. Joyce reminded the Board that the federal agencies welcome and find focused recommendations most useful.

The meeting was adjourned for the day at 5:31 p.m. Pacific Time.

## **Discussion of Next Meetings and Other Business**

Dr. Ganster proposed Tuesday, December 1, 2015, as the date for the next meeting of the Board. Ms. Gantner suggested it be held either from 11:00 a.m. to 3:00 p.m. or 12:00 to 4:00 p.m. Eastern Time. Ms. Mather-Marcus noted that the BECC/NADB meets on December 2, 2015, in San Antonio. It was agreed that the next meeting would be held on Monday, November 30, 2015, from 11:00 to 3:00 p.m. Eastern Time. Ms. Gantner reminded the Board that a quorum will be necessary at that meeting to approve the advice letter.

Dr. Ganster indicated that Brownsville, Texas, has been proposed as the location of the Board's next face-to-face meeting. Mr. Stormont noted that Brownsville's airport is small and might require attendees to fly into larger local airports in McAllen or Harlingen. Mr. Samuel Coleman recommended Brownsville for its unique qualities—its location on the Gulf of Mexico and sister city in Mexico: Matamoros. Brownsville also was selected to participate in the Strong Cities, Strong Communities Initiative. Ms. Gantner asked the Board members to send her the dates in February and March 2016 that they cannot meet, and she will send a Doodle poll to the Board members to select dates for the 2016 meeting, which will be scheduled for 2 days. Mr. Joyce noted that a February meeting would be preferable to allow more time to work on the report. He suggested that the Board meet by teleconference in January 2016, prior to the face-to-face meeting to produce a framework and a plan for generating the annual report.

Mr. Joyce raised the possibility of having optional onsite visits in Brownsville. At a past meeting, the Board had visited a desalination plant and found the experience extremely useful and valuable.

Ms. Gantner reviewed the process for preparing the annual report. Ms. Gantner stated that it takes approximately 9 months to produce the report. Between Board meetings, she will assist workgroups in setting up conference calls to work on the report. It needs to be finished by October 2016, to allow time for editing and desktop publishing.

Dr. Ganster proposed using Dropbox to share copies of documents and reports.

## **Continued Work on the Development of the Advice Letter and the 17th GNEB Report**

Dr. Ganster noted that two parallel efforts are underway: the development of an outline by Dr. Wilder and the creation of a narrative by Dr. Eaton. By the time the meeting adjourns, specific writing assignments will need to have been made, and the ideas that will shape the advice letter will need to have been agreed upon. Mr. Niemeyer commented that given the short timeframe to complete the advice letter, it need not be overly complicated or as long as previous advice letters; therefore, he favored the narrative approach. Ms. Abram favored a hybrid of the approaches represented by the outline and the narrative. Dr. Ganster suggested that part of the Board, led by Dr. Wilder, further develop the outline, while others on the Board,

led by Dr. Eaton, work on the narrative. The efforts of the two groups then could be compared. Ms. Abram responded that the Board needs to agree on a structure before writing can start.

Mr. Joyce reminded the Board to include citations, where applicable, to support their conclusions and recommendations. These citations will be verified and edited later to ensure that they are accurate and formatted correctly.

The Board members discussed the uniqueness of the border region and its inhabitants. There was support for keeping the focus of the advice letter on the U.S. border region, which is a unique part of the country. Dr. Ganster observed that some issues have impacts that affect other regions, however, such as the effects of the water crisis on southern California and Baja California. Mr. Salinas commented that it will be important to focus resources on the border region. He observed that few sustained improvements have been achieved in the border region.

Dr. Eaton described the proposed organizational structure of the advice letter. The letter would present the problem of climate change, discuss the special attributes of the border region, enumerate the positive steps that federal agencies are taking to address climate change in the border region, list additional steps that can be performed, present barriers to taking these steps, and recommend how to implement the steps. Currently, the advice letter does not include themes, but these could be incorporated. The current draft lists the risks of climate change as being an increase in average land and ocean temperatures; an increase in heat waves, heat extreme days and nighttime temperatures; a decrease in total rainfall and runoff with an increase in the intensity of precipitation; deleterious effects on wildfires, sea level, crop water demands, peak electricity demands and ecosystems; and an increase in zoonotic diseases. It describes how these effects will be exacerbated by such border region conditions as poverty, cultural and linguistic diversity, and the vulnerability of tribal populations. The advice letter describes how the U.S. government has taken steps to address climate change that include increasing water availability.

Additional material to include in the advice letter was discussed. Dr. Pohlman proposed including near-term, mid-term and long-term goals. She stated that because some effects of climate change will not be realized immediately, it would be short-sighted not to include long-term goals. Board members suggested focusing on near-term goals in the advice letter and adding mid- and long-term goals in the report. It was suggested that short-term goals are particularly relevant given the imminent change in the Administration. Ms. Pozzebon suggested including in the introduction a statement about the importance of transboundary cooperation and collaboration to address climate change risks. Geographic variation of economic status in the border region also was discussed as a topic to include; the City of San Diego, for example, is not economically representative of the rest of the border region. Mr. Coleman suggested that the advice letter focus on three topics: (1) health; (2) water, including food; and (3) energy. He proposed that specific recommendations be included as an appendix.

Dr. Ganster asked the Board members for suggestions about recommendations to include in the advice letter. The following recommendations were offered by the Board members:

- Ensure that the federal government has advanced metering capabilities to measure energy and water use so that energy and water demand can be managed (Dr. Pohlman).
- Develop scorecards to evaluate how well federal agencies are addressing the effects of climate change (Dr. Pohlman).
- Enhance urban treescapes and food forests. Benefits of these measures include sequestering carbon and decreasing urban heat islands (Dr. Pezzoli).

- Enhance rural treescapes. Further inland, the climate becomes hotter. Rural forests reduce consumption of energy (Mr. Olmedo).
- Build green infrastructure for stormwater management (e.g., green swales) (Dr. Pezzoli).
- Expand collaboration with Mexico. Each federal office could develop a plan for collaboration (Dr. Zamora).
- Restore federal funding for the Watershed and Flood Prevention Operations Program in the border region to build and rehabilitate flood control structures. This program is administered by the U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service. Flood control structures exist that need rehabilitation, and the growing population creates a high potential for loss of human life and property damage from flooding (Mr. Salinas).
- Design a USDA Landscape Initiative in the border region (Mr. Salinas).
- Coordinate planning and wastewater treatment in rural development (Mr. Salinas).
- Encourage rural development that builds vertically rather than increasing sprawl (Mr. Olmedo).
- Ensure that energy conservation projects have a monitoring and verification phase (Mr. Storment).
- Target border crossings, federal buildings, landfills and water/wastewater facilities for energy conservation (Mr. Storment).
- Provide resources and assistance for energy conservation to small communities (Mr. Storment).
- Fund the Federal Energy Management Program to perform energy and water audits in the border region (Dr. Pohlman).
- Develop the information technology infrastructure to perform data analysis for energy and water smart meters for demand-side management (Dr. Pohlman).
- Assist communities in taking advantage of the services offered by ESCOs (Mr. Storment).
- Support improvements in wastewater treatment and waste management. Improper handling of wastes poses a public health risk. Improvements can be addressed at least in part with green infrastructure (Ms. Pozzebon).
- Establish a standing workgroup of the CEQ to address the U.S.-Mexico border region (Mr. Niemeyer).
- Establish a formal workgroup comprised of representatives of federal, state and tribal agencies to work together on problems in the border region (Mr. Coleman).
- Institute a contest in which high schools compete to conserve water. The prize could be the federal government providing solar panels that generate 1 MW of electricity to the winning school. The potential for success of public relations campaigns for water conservation is illustrated by the City of Santa Fe, which reduced daily water consumption to 86 gallons per person (Ms. Nanasi).

- Institute a contest between cities to inventory GHGs. The winner could be awarded solar panels that generate 10 MW of electricity (Ms. Nanasi).
- Address problems with invasive species that are exacerbated by climate change (e.g., oak borers) (Mr. Parada).
- Study the effect of climate change on ground water recharge. Most tribal communities rely on ground water rather than surface water for their drinking water needs (Mr. Parada).
- Enhance communication with the public to educate people about climate change (Dr. Zamora).
- Implement the adoption of renewable energy sources by states under the federal Clean Power Plan. Solar photovoltaic energy is of particular benefit in the border region (Ms. Abram).
- Evolve a flood risk strategy that takes into account the best available climate science. Both sea level rise and land flooding, the prediction of which has greater uncertainty, are of concern in the border region. The new Federal Flood Risk Management Standard creates new and wider flood plains (Dr. Payne).
- Create incentives for water efficiency using WASCOs (Mr. Frisbie).
- Seek a more equitable distribution of water deliveries between Mexico and the United States using harmonized assessment tools. Minute 319 is an example of transboundary cooperation on water deliveries (Mr. Frisbie).
- Continue funding USDA Natural Resources Conservation Service (NRCS) programs that provide financial assistance to increase energy efficiency in agriculture (Mr. Salinas).
- Establish capacity-building mechanisms to assist disadvantaged communities in competing for grants and other resources. Disadvantaged communities would benefit from assistance with grant writing (Dr. Payne).
- Facilitate cooperation of state agencies with Mexico by easing the paperwork burden for travel by state officials across the U.S.-Mexico border (Dr. Ganster).
- Restore grasslands that have been damaged by overgrazing, resulting in the growth of invasive species and changes in soil composition (Mr. Cruz).
- Assist in the development of traditional ecological knowledge by tribes (Mr. Cruz).
- Provide incentives to the public to conserve water. For example, El Paso provided incentives for installing low-flow showers and toilets and instituted water scheduling (Dr. Palacios).

The Board discussed how to frame the recommendations. Dr. Pohlman suggested presenting information on the return on investment. Ms. Grijalva emphasized the need for specificity in the recommendations, including identifying responsible agencies and even the program under whose jurisdiction a recommendation might fall.

There was support from the Board to research existing groups and resources that address climate change adaptation. For example, Dr. Pohlman indicated that the White House has formed a task force on climate change adaptation, although its focus is not on the border region. Dr. Zamora indicated that the

International Boundary and Water Commission (IBWC) might have a group that addresses climate change. Dr. Payne stated that the National Oceanic and Atmospheric Administration's (NOAA) website on climate science and information ([www.climate.gov](http://www.climate.gov)) contains an inventory of tools and adaptive strategies. Dr. Pohlman indicated that President Obama's Climate Action Plan contains information about federal activities that already are being performed. Mr. Salinas mentioned the USDA Climate Hub program as a potential source of information.

The Board paused in its work on the development of the advice letter and the report for public comments.

### **Public Comments**

No oral public comments were offered, and Ms. Gantner had received no written public comments.

### **Continued Work on the Development of the Advice Letter and the 17th GNEB Report**

Dr. Ganster stated that the Board will need to synthesize what had been discussed. Dr. Wilder's outline contains the major themes identified by the Board. Dr. Eaton thought it would be worthwhile to form workgroups that would develop material to fill gaps in the draft advice letter. Ms. Gantner stated that each workgroup will need to work independently; she noted that common use of Dropbox, as Dr. Ganster had suggested earlier in the meeting, might be interpreted as a meeting of the Board, which would need to be open to the public. Instead, all comments and text should be sent to Ms. Gantner for distribution.

The Board discussed the major categories to include in the advice letter. The appropriate number of categories also was considered. Dr. Payne advocated for placing the categories in a broader ecosystem context. Dr. Pohlman observed that if the Board does not consider the movement of goods and people, it will be ignoring an aspect of what makes the border region unique. Dr. Pezzoli suggested building on the 16th Report, recognizing the importance of considering the health of the land as well as the people of the border region.

The Board recognized the need for the recommendations to be very specific. Mr. Coleman commented that it will be important to convey a sense of urgency in the advice letter to induce people to take action; he noted that climate change is affecting human health today, not just in the future. Mr. Coleman also stated that all recommendations should be included in the advice letter. He recognized that certain recommendations would require an innovative approach to link them to one of the categories in the advice letter; for example, overgrazing affects health by making it difficult to raise cattle on existing land, which interferes with healthy eating. Dr. Ganster linked drought and human health by citing an increase in wildfires. For more information about the effects of climate change on human health, Ms. Pozzebon proposed that the Board consult the latest IPCC report, as well as the Centers for Disease Control and Prevention's website on climate and health ([www.cdc.gov/climateandhealth/](http://www.cdc.gov/climateandhealth/)), which includes effects on air quality by such border-specific problems such as idling at the border.

### ***Board Draft Recommendations***

At Dr. Ganster's request, the Board paused in its work on the development of the advice letter and the report to write down draft recommendations. Ms. LaRocque suggested that each of the Board's recommendations refer to the particular vulnerability of people and the environment in the border region. Mr. Parada cited the limited resources supporting tribal communities. He added that the introduction and establishment of invasive species affects the availability of water. The list of draft recommendations submitted by Board members during the meeting, including those recommendations submitted by members after the meeting, is presented in Appendix C.

## Continued Work on the Development of the Advice Letter and the 17th GNEB Report

Ms. Mather-Marcus presented a revised outline for the Board's consideration. The sections of the outline were as follows:

- **Introduction: Why do we care about this particular region?** This section will provide the “hook” to capture the reader’s attention. It will explain that the border region is a case study of what will happen to the rest of the U.S. population.
- **What is the problem?** This section will define the problem and introduce the major categories.
- **Why is the border unique?** This section will discuss vulnerable populations, as well as the unique commerce and economic activities in the border region.
- **What is already being done?** This section will discuss how much of the existing national effort to address climate change resilience has focused on the border region. In addition, it will address bilateral activities.
- **What are the major goals?** The goals will be developed in greater detail in the report.

The Board debated what cross-cutting subcategories should appear under the major categories. Board members commented on the growth of commercial traffic in the border region, which has strained the capacity of the region’s transportation infrastructure and includes a preponderance of traffic that travels through the border states to other destinations. Dr. Wilder suggested including a subcategory focused on equity issues that would address impacts on vulnerable populations. Board members advocated for highlighting tribal issues, emphasizing the need to be respectful toward tribal nations. Mr. Evaristo Cruz noted that often, the Mexican sister city is the economic driver in U.S.-Mexico sister city pairings (e.g., Ciudad Juárez -El Paso). As a result, the success of a resiliency initiative in a U.S. border city can depend on the cooperation of its Mexican sister city. Dr. Ganster responded that the Board can recommend that the United States actively engage with Mexico in resiliency efforts. Dr. Payne suggested including a discussion of indicators of success. Ms. Pozzebon proposed including education as a cross-cutting subcategory.

Dr. Ganster presented the draft advice letter that Dr. Eaton had prepared. As a next step, he proposed recruiting a small team to update the draft. In addition, the Board needs to identify workgroups that would work on specific areas of the advice letter. Dr. Eaton observed that adding the recommendations to the advice letter could be done quickly. Mr. Jose Angel responded that in the past, selecting which recommendations to include had proven time consuming. Dr. Wilder affirmed the need to include definitions in the advice letter. Dr. Eaton enumerated the following gaps in the current draft: other regional climate risks; regional elements that make the border region either special or representative; ongoing federal initiatives on climate change that are relevant to the border region; performance measures; and recommendations, which each should have outcomes, benefits and implementation plans.

Mr. Stormont asked whether the advice letter should focus on short-term as opposed to long-term recommendations. Mr. Joyce replied that the advice letter should include the key issues that the Board intends to develop in the full report, as well as some key recommendations on which the Board will want to expand. Ms. Grijalva advocated for focusing on short-term recommendations because of the limited tenure of the current Administration. Mr. Stormont also favored focusing on recommendations that would have an immediate impact. Dr. Eaton suggested obtaining feedback from federal agencies on the recommendations before finalizing the advice letter.

The Board members discussed the length and degree of detail to provide in the advice letter. Dr. Wilder proposed that each theme be considered as a problem that would be elaborated on in several paragraphs of descriptive text. Several Board members expressed some concern that the advice letter was beginning to seem more like a report than a letter. They stated that the advice letter needs to include background but should be concise and focus on specific, actionable recommendations.

Dr. Pezzoli asked about the audience for the advice letter and whether the Board will receive feedback on it. Mr. Joyce responded that the CEQ will provide a detailed response to the Board's advice letter. The advice letter is distributed to the relevant federal agencies, and they are asked to respond. Dr. Pezzoli asked for clarification about whether the advice letter mainly serves as a blueprint for the report or whether it gives actionable recommendations that can be addressed in the near term. Mr. Joyce replied that the advice letter serves both purposes.

The Board members discussed the format for presenting their recommendations. Ms. Lauren Baldwin suggested that in addition to drafting an advice letter, the Board might consider producing a video to help communicate its message to the public. Ms. Gantner responded that the Board's mandate is to offer its recommendations to the President and Congress. Mr. Joyce added that other advisory committees have been informed that there are no resources available to produce a video. Mr. Niemeyer proposed including figures in the advice letter.

### ***Board Workgroups***

Based on the Board's discussions, Ms. Grijalva proposed the formation of the following seven workgroups:

- Other regional climate risks.
- Special elements of the border region.
- Federal government agencies.
- One workgroup for each of the four themes: (1) water, (2) energy, (3) health, and (4) movement of goods and people.

There was debate over the name of the movement of goods and people workgroup. It was intended to encompass trade as well as movement of people for other reasons (e.g., visiting relatives, shopping, tourism). Dr. Ganster added that a core writing group to help Dr. Eaton draft the advice letter also is needed. Dr. Wilder suggested that the Board members divide themselves among the workgroups according to their areas of expertise. Ms. LaRocque suggested that the workgroup on federal initiatives be comprised of the federal members. The Board members volunteered for workgroups, and chairs and co-chairs were chosen for each workgroup. The composition of the workgroups, including Board members who volunteered after the meeting, is presented in Appendix D.

The Board members discussed the timeline and the process for products that each workgroup will produce. Dr. Ganster stated that the deadline for the first drafts of each section of the advice letter is October 8, 2015. Proper documentation of source material should be provided where appropriate. The core writing group will incorporate the contributions of each of the workgroups. The core group will have 2 weeks to produce a draft letter that will be distributed to the Board members for their review on October 22. The workgroups will have until November 1 to respond to the draft. A final draft will be sent out to the Board members on November 9 to allow time for review by their constituencies before the November 30 meeting to discuss and approve the advice letter.



## **Adjournment**

Dr. Ganster thanked the participants for their efforts and participation. He commended the group, and especially thanked Drs. Wilder and Eaton for their contributions. Mr. Joyce added his appreciation of the efforts of the Board.

The meeting was adjourned at 2:16 p.m. Pacific Time.

## Action Items

- ✧ Board members should send to Ms. Gantner the dates in February and March 2016 that they are not available to meet.
- ✧ Ms. Gantner will send a Doodle poll to the Board members to select the date for the 2016 meeting.
- ✧ Workgroups will produce drafts of their sections of the advice letter and submit them to Ms. Gantner by October 8, 2015.
- ✧ The core writing group will produce a draft advice letter that will be distributed to the Board members by Ms. Gantner for their review on October 22.
- ✧ The workgroups will send comments on the draft letter to Ms. Gantner by November 1.
- ✧ The core writing group will revise the letter according to the workgroups' comments and a final draft will be sent to the Board members on November 9 to allow time for review by their constituencies.
- ✧ The Board will meet next on Monday, November 30, 2015, from 11:00 to 3:00 p.m. Eastern Time to discuss and approve the advice letter.

## Appendix A: Meeting Participants—Draft List

### Good Neighbor Environmental Board

#### Chair

**Paul Ganster, Ph.D.**

Director  
Institute for Regional Studies of the Californias  
San Diego State University  
San Diego, CA

#### State Representatives

**Jose L. Angel**

Assistant Executive Officer  
California Regional Water Quality Control  
Board, Region 7  
State Water Resources Control Board  
Palm Desert, CA

#### Business Representatives

**Laura Abram**

Director, Public Affairs  
First Solar, Inc.  
San Francisco, CA

**Scott D. Storment**

Principal  
Green Hub Advisors, LLC  
San Antonio, TX

**Jack Monger**

Executive Director  
Industrial Environmental Association  
Coronado, CA

#### Nongovernmental Organization Representatives

**Francisco Zamora Arroyo, Ph.D.**

Director  
Colorado River Delta Legacy Program  
Sonoran Institute  
Tucson, AZ

**Luis Olmedo**

Executive Director  
Comite Civico Del Valle, Inc.  
Brawley, CA

**Mariel Nanasi**

Executive Director  
New Energy Economy  
Santa Fe, NM

### **Academic Representatives**

**David J. Eaton, Ph.D.**

Bess Harris Jones Centennial Professor  
Lyndon B. Johnson School of Public Affairs  
The University of Texas at Austin  
Austin, TX

**Rebecca L. Palacios, Ph.D.**

Associate Professor  
Public Health Sciences  
New Mexico State University  
Las Cruces, NM

**Keith Pezzoli, Ph.D.**

Professor of Teaching  
Director, Urban Studies and Planning Program  
Department of Communication  
University of California, San Diego  
La Jolla, CA

**Margaret Wilder, Ph.D.**

Associate Professor  
School of Geography and Development  
Center for Latin American Studies  
University of Arizona  
Tucson, AZ

### **Local/County Representatives**

**Lauren Baldwin, LEED-GA**

Sustainability Program Specialist  
City Manager's Department  
Office of Resilience and Sustainability  
City of El Paso  
El Paso, TX

**Elizabeth A. Pozzebon, M.S., REHS**

Director  
Department of Environmental Health  
San Diego County  
San Diego, CA

**Lisa LaRocque**

Sustainability Officer  
Public Works Department  
City of Las Cruces  
Las Cruces, NM

### **Tribal Representatives**

**Evaristo Cruz**

Director  
Environmental and Natural Resources  
Ysleta del Sur Pueblo  
El Paso, TX

**John C. Parada**

Tribal Environmental Programs Director  
Los Coyotes Band of Cahuilla Cupeño Indians  
Warner Springs, CA

### **Federal Members**

*Department of Agriculture*

**Salvador Salinas**

State Conservationist  
Natural Resources Conservation Service  
Temple, TX

*Department of Commerce—National Oceanic  
and Atmospheric Administration*

**Jeffrey Payne, Ph.D.**

Acting Director  
Office for Coastal Management  
National Oceanic and Atmospheric  
Administration  
Mount Pleasant, SC

*Department of Homeland Security*  
**Teresa R. Pohlman, Ph.D., LEED, AP**  
Executive Director  
Sustainability and Environmental Programs  
Undersecretary for Management  
Washington, D.C.

*Department of the Interior*  
**Jonathan Andrew**  
Interagency Borderlands Coordinator  
Office of the Secretary  
Washington, D.C.

**Designated Federal Officer**

**Ann-Marie Gantner**  
Acting Designated Federal Officer  
Good Neighbor Environmental Board  
U.S. Environmental Protection Agency  
Washington, D.C.

**Federal and State Agency Alternates**

*Department of State*  
**Beverly Mather-Marcus**  
Energy and Environment Officer  
Office of Mexican Affairs  
Washington, D.C.

*International Boundary and Water Commission*  
**Russell Frisbie**  
Special Assistant  
International Boundary and Water Commission,  
U.S. Section  
Washington, D.C.

**U.S. Environmental Protection Agency Regional Office Participants**

*Region 9*  
**Jeremy Bauer**  
San Diego Border Office  
San Diego, CA

**Doug Liden**  
Border Water Contact  
San Diego, CA

*Department of Transportation*  
**Sylvia Grijalva**  
U.S.-Mexico Border Planning Coordinator  
Federal Highway Administration  
Phoenix, AZ

*Environmental Protection Agency*  
**Samuel Coleman, P.E.**  
Deputy Regional Administrator  
Region 6  
Dallas, TX

*Texas Commission on Environmental Quality*  
**Stephen M. Niemeyer, P.E.**  
Border Affairs Manager and Colonias  
Coordinator  
Intergovernmental Relations Division  
Austin, TX

**Maria E. Rangel**  
San Diego, CA

**Tomas Torres**  
Director  
San Diego Border Office  
San Diego, CA

## **U.S. Environmental Protection Agency Headquarters Participants**

### **Mark Joyce**

Associate Director  
Office of Diversity, Advisory Committee  
Management and Outreach  
Washington, D.C.

### **Other Participants**

#### **Wael Al-Delaimy**

Chief, Division of Global Health  
Global Health Initiative  
University of California, San Diego  
La Jolla, CA

#### **Danielle Boudreau**

Program Associate  
Tijuana River National Estuarine Research  
Reserve  
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#### **Jeff Crooks**

Research Coordinator  
Tijuana River National Estuarine Research  
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#### **Denise Moreno Ducheny**

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La Jolla, CA

#### **Ana Eguiarte**

Tijuana River National Estuarine Research  
Reserve  
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#### **Irma Flores**

Communications and Community Engagement  
Officer  
Border Environment Cooperation Commission  
Ciudad Juárez, Chihuahua, Mexico

#### **Maria Elena Giner, P.E.**

General Manager  
Border Environment Cooperation Commission  
San Antonio, TX

#### **Barbara Maco**

Wactor & Wick LLP  
Oakland, CA

#### **Stanley Maloy, Ph.D.**

Professor  
Dean, College of Sciences  
Associate Director, Center for Microbial  
Sciences  
San Diego State University  
San Diego, CA

#### **Ruth Martin**

Executive Assistant  
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#### **Gabriela Muñoz Meléndez, Ph.D.**

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El Departamento de Estudios Urbanos y del  
Medio Ambiente  
El Colegio de la Frontera Norte  
Tijuana, Baja California, Mexico

#### **Imre Nagy**

Associate Professor  
Department of Regional Studies and Statistics  
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#### **David Pierce, Ph.D.**

Climate Research Division  
Scripps Institution of Oceanography  
La Jolla, CA

**Carolina Prado**  
Graduate Student  
Department of Environmental Science, Policy,  
and Management  
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**Alan Sweedler, Ph.D.**  
Professor of Physics  
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**Jennifer Lee, Ph.D.**  
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**Rick Van Schoick**  
Portfolio Director  
North American Research Partnership  
San Diego, CA

**Emily Young, Ph.D.**  
Vice President of Community Impact  
San Diego Foundation  
San Diego, CA

## Appendix B: Meeting Agenda



### Good Neighbor Environmental Board

Wyndham San Diego Bayside  
1355 N Harbor Drive  
San Diego, CA 92101

September 17–18, 2015

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#### Meeting Day 1

#### Thursday, September 17

8:30 a.m.                    **Registration**

9:00–9:15 a.m.           **Welcome, Introductions and Overview of Agenda**

- **Ann-Marie Gantner**, Acting Designated Federal Officer  
Office of Diversity, Advisory Committee Management and Outreach
- **Paul Ganster**, Chair  
Good Neighbor Environmental Board
- **Board Introductions**

9:15–10:00 a.m.           **Global and Regional Climate Variability: The U.S.-Mexican Border Region**

- **David Pierce**, Ph.D.                    Scripps Institution of Oceanography  
Global Climate Change and Its Impacts on the U.S.-Mexican Border  
Region
- **Q&A and Discussion**

10:00–10:15 a.m.        **Break**

10:15 a.m.–12:00 p.m. **Panel on Climate Effects in the Border Region**

- **Stanley Maloy**, Ph.D.                    San Diego State University  
Climate Variability and Disease in the Border Region
- **Alan Sweedler**, Ph.D.                    San Diego State University  
Climate Change and Energy Issues
- **Emily Young**, Ph.D.                    San Diego Foundation  
Preparing for Climate Change in the San Diego-Tijuana Border Region



- **Gabriela Muñoz-Meléndez, Ph.D.** El Colegio de la Frontera Norte  
Climate Change Strategies for Baja California and Mexico
- **Q&A and Discussion**

12:00–12:30 p.m.	<b>Public Comments</b>
12:30–1:30 p.m.	<b>Lunch</b>
1:30–2:00 p.m.	<b>Border Environment Cooperation Commission Green Infrastructure Initiative and Other Climate-Related Projects</b>
	<ul style="list-style-type: none"> <li>• <b>Maria Elena Giner, General Manager</b> Border Environment Cooperation Commission</li> </ul>
2:00–3:15 p.m.	<b>Discussion of Advice Letter and the 17th Report to the President on Climate Change Resilience in the U.S.-Mexico Border Region</b>
3:15–3:30 p.m.	<b>Break</b>
3:30–5:30 p.m.	<b>Continuation of Discussion</b>
5:30 p.m.	<b>Adjournment</b>

#### Meeting Day 2

#### **Friday, September 18**

8:00 a.m.	<b>Registration</b>
8:30–10:00 a.m.	<b>Discussion of Next Meetings and Other Business</b>
10:00–10:15 a.m.	<b>Public Comments</b>
10:15–11:45 a.m.	<b>Continued Work on Development of Advice Letter and the 17th Report</b>
11:45 a.m.–12:00 p.m.	<b>Break</b>
12:00–12:45 p.m.	<b>Working Lunch</b>
12:45–4:00 p.m.	<b>Continued Work on Development of Advice Letter and the 17th Report</b>
4:00 p.m.	<b>Adjournment</b>

## Appendix C: Board Draft Recommendations

- Mr. Jonathan Andrew
- The U.S. federal government should continue existing hydrologic monitoring and researching the southwest border region and expand this work with the aim of establishing a comprehensive, borderwide system of monitoring that will provide technical information to support decision making on water use and conservation and modeling, and ensure adequate ecological flows to support the unique biodiversity of the region.
  - The research conducted on the lower Colorado River under Minute 13 in cooperation with Mexico is recognized, and it is recommended that this work continue.
- Dr. Francisco Zamora Arroyo
- Develop a communication strategy/tools to increase awareness among border communities (populations) (United States and Mexico) about climate change and its impacts and promote a call to action to prevent and/or mitigate the causes of climate change.
  - Use the IBWC framework to develop in collaboration with Mexico an Action Plan for every region/watershed along the border by August 2016 that identifies the immediate and specific impacts and actions (1–3 years) of climate change that need to be addressed/taken to mitigate/prevent further socioeconomic issues. Funding needs to be provided to the IBWC to facilitate the development of these plans.
- Ms. Lauren Baldwin
- **Clean and Green:** Provide direct funding to vetted clean technologies that support water sustainability for the area (e.g., companies that treat waste brine from desalination plants, companies that can install photovoltaic on desalination plants).
  - **Clean and Green:** Provide direct funding to utilities to help governments and businesses install smart meters to support more efficient demand-side management (e.g., give the U.S. Environmental Protection Agency [EPA] funds to expand its SCORE program to include smart meter conversions).
  - **Recognition and Communication:** The federal agencies should request a 1-page letter from cities outlining their gaps and how mapping their issues will help improve the resiliency of their areas so they can target and prioritize efforts. Recognize the most compelling letters and provide direct funding to either hire a mapping staff member or a mapping firm to generate detailed layers of health impacts, respiratory diseases, invasives, flood paths and drainage, tree canopy, access to healthy food, distance from parks, high water use, high crime, and so forth, and then analyze and target efforts. This will not only help the federal agencies and local governments quantify the changes made, but also help them create layered solutions that help our most vulnerable populations along the border and get to the source of the issue. In addition, mapping is such an effective communication tool and even the most critical skeptics of the validity of climate change cannot deny maps. Maps will help us communicate about climate change to local leadership, business owners, community members, and so forth, much more effectively.

- **Green Is the Answer:** The Department of Transportation (DOT) should require that all transportation projects incorporate green infrastructure. This directly supports our vulnerable populations along the border because we will see less hardscape and less damage resulting from flash flooding.
- **Green Is the Answer:** Funding should be allocated to help water utilities receive a “green infrastructure” expert for a period of 2 years to help the utility incorporate green infrastructure to reduce nuisance flooding costs and help them move away from retention ponds!
- **Green Is the Answer:** Create a fund to support developers and incentivize green infrastructure.
- **Green Is the Answer:** The DOT also should require state DOTs to allocate a higher percentage of funds to bike and path infrastructure and high occupancy vehicle (HOV) lanes/carpooling incentives.
- **Border Crossing Collaboration:** Form an effective intergovernmental working group on border and environmental affairs, specifically focused on border crossings. The emissions from idling for hours at a time is negatively affecting some of the folks in the poorest ZIP codes in the United States. Not to mention the money lost from folks who are discouraged from visiting and shopping because of long wait times. Also, because communication with Customs and Border Protection (CBP) is not always effective, there often is misinformation spread about border communities.

Mr. Samuel  
Coleman

- The current structure of the U.S.-Mexico border program is not sufficiently broad to address climate impacts related to the border region. We recommend that the U.S.-Mexico border program be reaffirmed to include federal agencies—specifically, the DOT, Department of the Interior (DOI), EPA, Health and Human Services (HHS), Department of Homeland Security (DHS), and U.S. Department of Agriculture (USDA), with EPA and DOI as co-leads. Membership should include the border states and impacted tribes. The current National Coordinator position should rotate between EPA and DOI every 2 years. The program should coordinate planning and implementation of activities by preparing an annual work plan to address border priorities.

Mr. Evaristo  
Cruz

- Traditional ecological knowledge:
  - First Nations have unique and culturally relevant efforts to address climate change.
  - EPA should continue to support these developments through funding.
  - Not all First Nations will be willing to share this knowledge.
- Range land management:
  - Because drought conditions and overgrazing impact land coverage and cause dry landscapes and an increase of invasive plants/shrubs, seek additional assistance from the Natural Resources Conservation Service

(NRCS) to continue range land management and incentives that promote these concepts.

- Make greater use of stormwater capture for residential areas. Rain capture systems to offset water consumption.
  - Implement water cistern programs.
- Change water culture. Promote greater water conservation measures that communities like El Paso have implemented.
- Improve the streets and sidewalks with green infrastructure.
- Improve tree coverage for communities using smart growth concepts.
- Use interactive geographic information system (GIS)/mapping data to log and archive these programs. Data layers can be used to track these proposed needs.

Mr. Russell  
Frisbie

- **Water Demand Reduction:** To address the diverging water supply and demand curves that are clearly manifest, the federal agencies should focus more on achieving tangible improvements in water use efficiency (recycling, smart grid, agricultural innovations).

Dr. Paul  
Ganster

- An Executive Order to:
  - Require that federal agencies cooperate with counterpart agencies in Mexico on addressing effects of climate change on U.S. border communities and ecosystems.
  - Facilitate agency-to-agency direct cooperation across the international boundary on a regular and routine basis, including timely mobilization of personnel.

Ms. Lisa  
LaRocque

- Housing and Urban Development (HUD) should provide assessment and interventions for vulnerable populations to ensure safety and welfare during extreme weather events brought about by climate change.
- EPA should standardize engineering protocols that fortify the use of green infrastructure/low-impact development (GI/LID) practices.
- The federal administration should establish a transgovernmental climate change border working group that includes environmental health, economic and social equity concerns.

Ms. Beverly  
Mather-  
Marcus

- Idea for the narrative—the piece where we explain why care/focus on the border region: Much as the Global Leadership in the Arctic: Cooperation, Innovation, Engagement and Resilience (GLACIER) conference highlighted the Arctic as a microcosm of the global physical changes caused by climate change, the U.S.-Mexico border is a microcosm of the socioeconomic and physical impacts of climate change on the U.S. population.

Ms. Edna  
Mendoza\*

- Clarify roles of various federal agencies (Federal Emergency Management Agency [FEMA], International Boundary and Water Commission [IBWC], U.S. Army Corps of Engineers) with responsibility for flood control and mitigation, particularly with respect to addressing flooding impacts on U.S. communities due to a transboundary/cross-border origin. Increase federal flood control funding; use equitable distribution of such funds, taking into consideration economic impacts to border communities if the need is left unaddressed.
- Enhance support for Low-Income Energy Programs (LIHEAP) and Weatherization Assistance Programs.

Mr. Jack  
Monger

- Recognize that there is an economic component to water, energy and health issues. Economic considerations will be necessary to incentivize the involvement of businesses.
- When businesses understand the impacts of their operations, profitability, and so forth, they will be motivated to complement programs to mitigate the impacts from climate change. Need to include strategies for developing support from business, whether the topic is health, energy, water or air quality. For example, there are low-flow shower heads and other water saving programs in this and many other hotels in San Diego because the public is demanding such measures. Hotels learned that the traveling public—particularly convention planners—were grading hotels based on the environmental/conservation measures they have implemented. This began long before California’s governor initiated such efforts. Also, the San Diego Foundation has begun a study to measure the costs to business of doing nothing.

Ms. Mariel  
Nanasi\*

- GNEB’s water-energy public education campaign that exposes the vision of what’s possible through real-world solar solutions.

Water scarcity, water quality and water security are of essential concern on the border. They affect everything from land management practices to food production to health (vector-borne diseases) to tourism. Widespread awareness is needed to create shifts in our society and in Mexico. We are proposing a Spanish/English public education campaign that will galvanize young people to action and have real-world impacts that reduce waste, raise public consciousness, save money and invest in local solutions—repurposing funds allocated for electricity costs into other vital school needs.

There will be a contest in high schools within 60 miles of the border that challenge young people to develop the best way to communicate beneficial water care and conservation (through art, song, logos and social media messaging). There will be a panel of diverse (race and age) judges. The 20 (or 50) best ideas will be funded and implemented!

The schools from where the 20 winners come also win 1 MW of solar energy panels, installed by a local solar company, for their school. The money from the electricity savings gets repurposed back into school services in perpetuity.

There will be (creative) signage that will be installed at every school that explains the educational, economic and other benefits of solar energy and elucidates the energy and water nexus.

Funds also will support the solar unveiling and community celebration at each school with music and food. Local leaders, school officials, students and state and federal officials will partake in the festivities.

Through educational materials, signage, inspiring (student) speeches, music and food, we will equip local decision makers with the knowledge, inspiration and EXPERIENCE they need to become effective renewable energy advocates. This well-funded public education and awareness campaign will change the narrative and galvanize hope in the time of climate change, expose the vision of what is possible, and build the foundation for further community action. This campaign will result in building local leadership (including young people), help educate thousands through the public relations water usage campaign, catalyze the economy through the deployment of solar energy, and create the engagement necessary for other on-the-ground victories.

Mr. Stephen  
Niemeyer

- Measure the amount of tree coverage in border cities and support local steps to increase those with local species.
- Create a federal task force focused on the border region that will measure the quality of life in the border region, as well as border ecosystems, and prepare a report on how to improve/support these.
- Increase federal funding for dam safety in the border region.
- Assess best management practices for water conservation by local border cities and share those.
- Partner with state, local and private entities to reduce water use in border communities, such as in hotels.

Mr. John  
Parada

- Initiate more collaborative efforts among entities for data sharing on issues, projects and remediation.
- Provide funding for disadvantaged communities to pursue renewable energy.
- Target funding for disadvantaged communities to mitigate or recover health-based effects from climate change.
  - Water resource depletion.
  - Ground water recharge to support the increase of surface water flow.
- Increase funding for environmental outreach, awareness and education.
- Provide permaculture funding to support programs to recycle, reuse and store ground water.

Dr. Jeffrey  
Payne

- Give agroforestry/urban forestry incentives for energy reduction in communities.
- Increase or create programs to identify biodiversity and conduct biological monitoring (Clean Water Act [CWA] §106).
- **Recommendation:** Evolve flood risk management strategies and actions in the border region to incorporate best available climate science and use of natural and nature-based infrastructure.

**Benefits:**

- Infrastructure investments last longer and risks to aging infrastructure are mitigated.
- Reduced loss of life and property, and less economic disruption.
- Improved water management.

**Strategies:**

- Address unique needs of coastal and interior communities.
- Reduce uncertainty in climate projections and improve scenario planning.
- Apply the Federal Flood Risk Management Standard to federal actions.
- Update flood insurance rate maps.
- Identify and employ incentives (e.g., FEMA, Community Rating System).

Dr. Keith  
Pezzoli

- **Enhance urban treescapes and food forests.** A civically engaged urban forestry program (including fruit and nut tree cultivation in urban food forests) can play a vital role in meeting municipal and regional efforts to deal with climate change. Many cities are creating urban treescape asset maps and developing urban forest management plans for multiple reasons (e.g., sequester carbon; reduce urban heat island impacts; increase local food production, green space and water conservation). It is important to document/evaluate/support this work from climate change mitigation, adaptation and resilience standpoints.
- **Build green infrastructure for stormwater management.** Climate change models suggest that an increase in the number of extreme weather events will likely bring more torrential downpours and flooding to many parts of California and nearby Mexico. Green infrastructure includes rain gardens, bioswales, permeable pavements, rainwater harvesting, and other naturally designed features created to conserve or enhance land, wetlands and ecosystems. Green infrastructure that reduces flooding while making more efficient use of water saves money and energy in ways that reduce a city's carbon footprint and vulnerability.
- **Food recovery/compositing.** Recover food waste to avoid landfill and off gassing (greenhouse gasses [GHGs]).

Dr. Teresa Pohlman

- **Energy and Water Metering and Demand-Side Management:** Recommend that Congress enact legislation to fund advanced metering and associated infrastructure for energy and water for federal, state and local governments. The Department of Energy would be responsible for a master plan for the federal departments and funding allocation, and the Governor's Council (?) would be responsible for a master plan and funding allocation for the state and local governments. Recommend also that state and local governments be responsible for periodic updates and performance metrics to ensure that demand-side management techniques are being used and are making a difference. The federal government already reports on metrics to the Office of Management and Budget through semi-annual scorecards.
- The federal government (Department of Energy) should standardize a methodology for Life Cycle Cost Analysis and Return on Investment for climate change-related projects.
- The federal government (Department of Energy) should fund and implement energy and water audits along the U.S.-Mexico border to identify opportunities for efficiencies and effective water and energy management.

Ms. Elizabeth Pozzebon

- Improve transboundary communities' cooperation regarding wastewater management, including the need to develop communication and governance protocols, and funding and expertise for wastewater infrastructure improvements to reduce contamination of watersheds and beach water, particularly at the Tijuana River. Baseline metric = beach water closures as a result of wastewater contamination from the Tijuana River.

Mr. Salvador Salinas

- The USDA administers many technical and financial assistance programs, and it should use these programs to promote conservation and energy efficiency. For example, the USDA-NRCS can designate a landscape initiative in the U.S.-Mexico border region to address ecosystem restoration/sustainability and use the appropriate financial and technical assistance. A component of the initiative can be to use conservation activity plans to complete energy audits and offer financial assistance to improve energy efficiency and reduce CO<sub>2</sub> emissions.
- The USDA Small Watershed Program (Public Law [Pub. L.] 566) administered by the NRCS is critical to mitigating the flood risks along the U.S.-Mexico border associated with climate change. The aging infrastructure of existing flood control structures, and encroachment of human populations below these structures places human populations and property at risk. Additionally, watershed plans have not been completed. Therefore, it is recommended that sufficient funding be included in the USDA-NRCS allocation under Pub. L. 566 to rehabilitate aging infrastructure and complete watershed plans in the U.S.-Mexico border region.

Mr. Scott Storment

- **Energy:** Create a U.S. borderwide initiative led by EPA to assist all border communities in conducting comprehensive energy management analyses (preliminary energy audits, vehicle distributed generation analysis) of all municipal facilities.
  - Target small border communities (25,000 and less).



- Include water systems/facilities/waste management/vehicle fleets.
- Measurement and verification (M&V) phase for GHG reductions based on fuels, energy savings and regional generation source (i.e., coal, natural gas, etc.).
- BECC also.
- **Water and Energy:** Promote a U.S. borderwide initiative with irrigation districts to identify water conservation and energy management project opportunities.
  - Work with energy service companies (ESCOs) to provide capital, capacity and project implementation within districts.
  - USDA, EPA and Bureau of Reclamation should fund preliminary analysis.
  - Pre-analysis provides basic information to incentivize and attract ESCOs and the new “water service company” (“WASCO”) type of company.
  - A WASCO is an ESCO that rolls water under its project umbrella.
- M&V phase for GHG reductions.
- BECC also.

Anonymous 1

- Greenhouse gas inventory—energy, water, and so forth.
- Focus recommendations on addressing impacts on most sensible receptors.
- Continue to provide incentives for development and implementation of green energy along the border.
- Assist rural and economically disadvantaged communities to increase institutional capacity to deal with climate change.
- Provide more outreach and education along the border.

Anonymous 2

- Continue to provide funding for energy equipment and transboundary joint training for emergency responders.
- Provide funding for state and local jurisdictions to conduct cooperative transboundary disease surveillance and control efforts.

Anonymous 3

- EPA, Bureau of Land Management (BLM) and other federal agencies should ensure that new infrastructure projects increase water efficiency and improve water/stormwater management, and incorporate “green” principles of design and materials (balance efficiency needs with green infrastructure).
- The Executive should facilitate cross-border work by key agencies engaged in managing and monitoring border environment resources to allow cross-border

travel within the region with facilitated, streamlined approval (of travel) processes.

- Specific attention should be given to populations likely to be disproportionately impacted by extreme climate events (e.g., heat waves, storms, flooding) and provide safety net assistance to ensure basic needs are met.

\*Added post-meeting.

## Appendix D: GNEB Workgroups

**Other regional climate risks:** Mr. Jonathan Andrew, Mr. Jose Angel, Mr. Samuel Coleman, Mr. Luis Olmedo, Dr. Rebecca Palacios and Dr. Jeffrey Payne (Chair).

**Special elements of the border region:** Mr. Evaristo Cruz, Ms. Sylvia Grijalva (Chair), Ms. Beverly Mather-Marcus, Ms. Edna A. Mendoza,\* Mr. Stephen Niemeyer, Mr. Luis Olmedo, Dr. Rebecca Palacios, Mr. Salvador Salinas, Mr. Scott Storment, Dr. Margaret Wilder and Dr. Francisco Zamora Arroyo.

**Federal government agencies:** Mr. Jonathan Andrew, Mr. Samuel Coleman (Co-Chair), Ms. Sylvia Grijalva, Ms. Beverly Mather-Marcus, Dr. Jeffrey Payne, Dr. Teresa Pohlman (Co-Chair) and Mr. Salvador Salinas.

**Water:** Mr. Jonathan Andrew, Mr. Jose Angel (Co-Chair), Mr. Russell Frisbie (Co-Chair), Ms. Lisa LaRocque, Mr. Stephen Niemeyer, Mr. Luis Olmedo, Mr. John Parada, Dr. Jeffrey Payne, Mr. Salvador Salinas, Dr. Margaret Wilder and Dr. Francisco Zamora Arroyo.

**Energy:** Ms. Laura Abram (Co-Chair), Mr. Jose Angel, Mr. Samuel Coleman, Ms. Lisa LaRocque, Mr. Luis Olmedo, Dr. Teresa Pohlman, Mr. Salvador Salinas, Mr. Scott Storment (Co-Chair) and Dr. Francisco Zamora Arroyo.

**Health:** Ms. Lauren Baldwin, Mr. Evaristo Cruz, Ms. Edna A. Mendoza,\* Mr. Luis Olmedo, Dr. Rebecca Palacios (Co-Chair), Mr. John Parada, Dr. Keith Pezzoli and Ms. Elizabeth Pozzebon (Co-Chair).

**Movement of goods and people:** Ms. Lauren Baldwin, Ms. Sylvia Grijalva, Ms. Edna A. Mendoza\* and Dr. Teresa Pohlman (Chair).

**Core writing group:** Mr. Jose Angel, Dr. David Eaton (Chair), Mr. Russell Frisbie, Dr. Paul Ganster, Mr. Stephen Niemeyer, Dr. Jeffrey Payne and Dr. Margaret Wilder.

\*Added post-meeting.

These minutes are an accurate description of the matters discussed during this meeting.



Paul Ganster  
Chair  
Good Neighbor Environmental Board

12/4/2015

Date

The Good Neighbor Environmental Board was created by the Enterprise for the Americas Initiative Act of 1992. The board is responsible for providing advice to the President and Congress on environmental and infrastructure issues and needs within the states contiguous to Mexico. The findings and recommendations of the Board do not represent the views of the Agency, and this document does not represent information approved or disseminated by the Environmental Protection Agency.

**Gantner, Ann-Marie**

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**From:** Paul Ganster <pganster@mail.sdsu.edu>  
**Sent:** Friday, December 04, 2015 9:09 AM  
**To:** Gantner, Ann-Marie  
**Subject:** Approval of Semtember 2015 meeting summary

Hi Ann-Marie,

I approve the meeting summary for the 2015 GNEB San Diego meeting.

Best wishes,

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Dr. Paul Ganster  
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Director, Field Stations Program  
Associate Director, Office of International Programs  
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