Testimony of
The Honorable Philip Levine
Mayor of the City of Miami Beach, Florida
before the U.S. Senate Committee on Commerce, Science and Transportation
Subcommittee on Science and Space

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Subcommittee Chairman Nelson and distinguished members of the subcommittee, it is an honor to be here today to share with you how the City of Miami Beach is responding and adapting to the impacts of climate change.

I am Philip Levine, Mayor of the City of Miami Beach. For almost 30 years, I have been an integral member of the Miami Beach community. Over the years, I have established a number of successful Miami Beach-based businesses, creating hundreds of job opportunities for local and area residents while contributing to the city's tax-revenue base. In 2010, I was tapped by President Obama's Secretary of Commerce to serve on a Task Force advising on U.S. tourism. Through my involvement with the Task Force, I worked to strengthen the nation's growing international tourism industry—which in turn strengthened our economy. Now as the Mayor of Miami Beach, I face the challenge to mitigate the tidal flooding our city is currently experiencing as a result of rising seas and to address other pressing issues associated with climate change.

Before I begin, I would like to welcome you and introduce you to our unique city. Miami Beach is a barrier island located in southeast Florida between Biscayne Bay and the Atlantic Ocean that was developed by filling in natural mangrove wetlands with dredge spoil over a porous limestone base. The island is situated within the sensitive habitat of the Biscayne Bay Aquatic Preserve, and is has flourished by linking the urban environment to its natural capital including parks, natural and man-made waterways, sea grass beds, mangrove shorelines, sand dunes, and over seven miles of white, sandy beaches. Miami Beach is globally-recognized for our rich history as a cultural and entertainment tourism capital and our role as an international center for innovation and business.

In 2012, the city drew 5.8 million overnight visitors, which spent $9.2 billion or 42% of the tourism revenue generated in Miami-Dade County. Miami Beach's real estate, including an inventory of 1,516 properties that contribute to the National Register of Historic Places and 12 historic districts, is worth over $23 billion. Despite being only 0.3% of Miami-Dade County's land mass, this value represents 12% of the County's total real estate value. Florida and the U.S. cannot afford to lose our city. However, due to climate change, the future of Miami Beach and other coastal communities has become more uncertain.

In the last century, scientists have encountered indelible evidence that our climate is warming. The Intergovernmental Panel for Climate Change has reported that over the period of 1901 to 2010, the global mean sea level rose by 0.19 meters, which is over half a foot. In 2012, a U.S. Geological Survey study concluded that sea levels along the east coast of the country will rise three to four times faster than the global average over the next century and the U.S. Army Corps of Engineers has projected that the water around Miami could rise up to 24 inches by 2060.

These projections are alarming, particularly for a city like Miami Beach that has an average elevation of 4.4 feet North American Vertical Datum 1988.

Our geographic location and low-lying topography make us inherently vulnerable to flooding, storm surge, and other climate change impacts. Therefore, it is imperative that our city is prepared to face these growing challenges so we can continue to thrive and contribute to the success of the region and our nation. Sea level rise is our reality in Miami Beach. We are past the point of debating the existence of climate change and are now focusing on adapting to current and future threats. My testimony here today is to share with you the anticipated short-term and long-term challenges Miami Beach is facing due to climate change, to highlight the mitigation and adaption strategies we currently have in place to make our city resilient in a changing climate, and to instill a sense of urgency in the federal government to prioritize climate change action and policy

Climate Change Challenges

Miami Beach's most pressing climate change challenge is sea level rise because we are already seeing its effects first-hand. In recent years, Miami Beach has observed an increased frequency of urban flooding caused by higher high tides, elevated groundwater levels, and oversaturated soils. Flooding so regularly impacts our city that residents have become familiar with its effect on city operations and their daily lives. It is not uncommon to worry about vehicles parked in areas with quickly rising tidal waters or to observe residents wading barefoot through knee-high flood waters to access their homes and local businesses. This reality is not acceptable and it is getting worse. During last year's king tides in October there was one and a half feet of salt water that inundated the streets. According to the National Oceanic and Atmospheric Administration, the king tides this October are anticipated to be three feet and nine inches above mean high water, which is almost three inches higher than our city saw last year.

Miami Beach also recognizes storm surge as a pressing climate change challenge. Like sea level rise, storm surge raises the waters surrounding Miami Beach above average levels, results in flooding, and causes damage to upland properties and infrastructure. During Hurricane Sandy in 2012, we experienced waves as high as 10 feet, which caused significant flooding and beach erosion throughout our city. While Miami Beach is familiar with hurricanes, scientific studies indicate that extreme weather events such as storms, floods, and hurricanes will increase in frequency and intensity.

Since I entered office in November 2013, I have made it my top priority to mitigate flooding and other climate change impacts. In January 2014, I formed a Blue Ribbon Panel on Flooding Mitigation to oversee the city's response to flooding and provide a comprehensive and visionary approach to flood management and sea level rise adaptation. The Panel's mission extends beyond providing guidance on stormwater design criteria and helping to prioritize infrastructure upgrades. For example, the Panel has also made recommendations to increase base flood elevations and has discussed the effects of climate change on our urban design. The City Commission relies on the Panel's recommendations to implement short-term strategies and long-term policies and solutions.

In coordination with the Panel, Miami Beach is working diligently to address existing flooding concerns. Guided by our updated Stormwater Management Master Plan, we are upgrading our aging gravity-based stormwater infrastructure with tidal control valves, pump stations, and other innovative structures that will improve drainage by preventing seawater from entering the system and by quickly expelling flood waters from urban areas, even during periods of elevated tidal or water table levels. Per the provisions of our stormwater management master plan, the standards used to design these on-going drainage projects will be updated as new data, including sea level rise projections and local ground water hydrology, become available. We are building a long-term sea level rise adaptation plans that focus on flexible low-regret strategies to accommodate a changing environment but that can be developed into more robust plans as existing uncertainty diminishes.

The city is also reinforcing the engineering and natural buffers surrounding our city to protect us against storm surge. We are prioritizing upgrades to the 3 miles of public seawall surrounding our city so they meet stringent design standards that take into account projected sea level rise and storm surge. Additionally, we are working with experts to identify mechanisms, like public-private partnerships, for upgrading the 57 miles of private seawalls. In coastal areas without seawalls, we are looking at natural infrastructure, such as building a more robust beach and dune system and living shorelines, for storm protection. For example, our on-going dune restoration and enhancement project that uses an ecosystem-based approach to restore the health of the dune system so it can continue to provide critical storm surge and erosion protection along our eastern coast.

Miami Beach is also committed to enhancing the environmental sustainability of our city. The Intergovernmental Panel on Climate Change concludes that the continued emission of greenhouse gases will cause further changes in the climate system, such as a warmer ocean, less sea ice, and higher sea levels. Therefore, in accordance with our municipal sustainability plan, the city is also making a concerted effort to reduce our carbon emissions in our city operations through a platform that leads our residents by example. Most recently, the City leveraged Federal Stimulus Funds to complete facility lighting and lighting control upgrades, HVAC control retrofits, water fixture replacements, and a geothermal district cooling plant optimization to reduce energy usage in select city facilities. We are also expanding the city fleet to include more vehicles that produce low-emissions and use alternative fuel options.

Thanks to the support we have received from the state and federal governments, we are reducing the number of single-occupancy vehicles by developing a more robust multi-modal transportation system and improving the availability of public transit options. We are designing our system using a complete streets approach to improve pedestrian and bicycle connectivity throughout the city and encourage the use of alternative transportation. We are also working to increase the incentives available to residents who are helping us reach our reduced carbon emission goals, such as users of low-emission and electric vehicles.

Moving into the future, Miami Beach is looking to become the nexus of innovation for short-term and long-term climate change planning. We are looking within and beyond our borders for innovative solutions to our climate change challenges. In September 2013, the city hosted a one-

day seminar where experts from southeast Florida and the Kingdom of the Netherlands engaged in multidisciplinary, cross-cultural discussions designed to explore if, where, and how Dutch approaches to water management, flood protection, and urban design are relevant in making our city more resilient. Over 100 individuals, including Miami Beach residents and business owners, government agency representatives, scientists, and students, were in attendance. Thanks to these collaborative discussions, we are currently evaluating water management strategies that we had not previously considered like the addition of water retention to public and private properties and of water storage components to new structures.

We will continue to foster and support information exchange by working with our local, national, and international partners like the Southeast Florida Regional Climate Change Compact (the Compact). The Compact is a collaborative effort among Palm Beach, Broward, Miami-Dade and Monroe Counties, their municipalities and partners who have come together to facilitate regional planning efforts. In 2012, the Compact released the Regional Climate Action Plan that provides an integrated framework to guide policies that align regional goals; reduce green house gas emissions; address vulnerabilities, such as water supply; preserve natural resources; effectively respond to risk and emergencies; and incorporates public outreach. Our on-going participation with the Compact is helping us and its members coordinate resources and develop win-win strategies that accomplish multiple goals to address climate change impacts.

Resiliency Planning

Miami Beach will continue to face numerous challenges in the future and is committed to seeking and implementing solutions to reduce climate change impacts. Over the next five years, we will spend over $300 million to complete neighborhood drainage projects that will alleviate chronic street-level flooding and reduce property flooding concerns. We are also funding two large-scale coastal protection projects, including the $300,000 effort to restore and enhance our dune system and our $25.7 million plan to upgrade the 3 miles of public seawalls surrounding our city. We are investing in our future, but we need your support.

Miami Beach needs the federal government to prioritize identifying economically-feasible sand sources for the continued restoration of our beaches. Since our beaches were initially restored by the U.S. Army Corps of Engineers in 1980, they have not only been instrumental in spurring our economic growth and establishing our city as one of the country's top tourist destinations, but they have also provided our investments and infrastructure with necessary storm surge protection. Recently, the offshore sand deposits that the U.S. Army Corps of Engineers depends on for the on-going maintenance of our beaches were depleted and alternative sand sources have yet to be identified. If a viable domestic source cannot be identified by the U.S. Army Corps of Engineers on-going Southeast Florida Sediment Assessment and Needs Determination (SAND) Study, the city urges that the federal government take the necessary steps to allow the use of non-domestic sand sources in the Dade County Beach Erosion Control and Hurricane Protection Project. Your pledge to preserve this critical asset is imperative to protect the future of our economy, our infrastructure, and our residents.

We also respectfully request your continued support of federal agencies like the U.S. Global Change Research Program, the U.S. Geological Survey, the Federal Emergency Management Agency, and the National Oceanic and Atmospheric Administration that inform and contribute to

our on-going planning and management efforts. Miami Beach is already directly engaging qualified experts and fostering cross-disciplinary dialogues with local universities such as Florida International University, Florida Atlantic University, and the University of Miami to further investigate local challenges, like the anticipated changes to our hydrology. However, U.S. communities, like Miami Beach, also depend on the data gathered by these federal agencies to evaluate threats to public services, our infrastructure, our residents, and our industries.

Our city was the first municipality in the region to take sea level rise into consideration in stormwater management and we will continue to be at the forefront of planning for climate change and contributing to make Miami Beach and the region resilient. The city is committed to ensuring that we continue to thrive as a world-class tourist destination with a high quality of life for its residents and we are looking for your commitment to help make that happen.

Subcommittee Chairman Nelson and distinguished subcommittee members, the City of Miami Beach would like to thank you for convening this hearing and for giving me the opportunity to testify before you. I would be pleased to answer any questions you may have.