

# National Symposium on Climate Change

## Poster Abstracts

### 1. Designing Online Inspector Tools to Identify Near-Term Climate Mitigation Strategies

UAE: G. Verutes, W. Dougherty, M. Rosa, C. Reed, L. Burke and J. Glavan

California: E. Hartge, L. Wedding, J. Reiblech, G. Verutes, and J. Williams

**Abstract:** Rising sea levels, population growth along coastlines and increasing hazards associated with coastal storms have set coastal communities on a collision course with the risks posed by climate change. Yet management decisions on coastal development and defense operate at short-term temporal scales that often fail to adequately account for long-term climate impacts and recognize the potential role of natural infrastructure in protecting people and property from rising seas and storms. Inspector tools (also referred to as *map portals*, *online viewers*, *dashboard*, and *story maps*) can show what is at stake if a proposed development were to occur, supporting planning dialogues and decision makers to evaluate management options at a level of detail far greater than traditional planning documents.

Two interdisciplinary teams of scientists, analysts, and legal specialists are co-producing online Inspector tools – one for the UAE CVI subproject of the LNR Climate Change Programme and the other for California, USA – to highlight where natural habitats in the coastal zone play the greatest role protecting people, property and other coastal assets. The Inspectors share stories and display spatial data at multiple scales, enabling users to interact with mapped outputs from coastal vulnerability models, combined with comparative graphs and summary tables. The science-policy team based in California is also using the Inspector to identify restoration projects that meet the least legal and political resistance, explore any legal impediments to using nature-based strategies, and provide examples of where such strategies have been successfully implemented.

### 2. Dynamics of winter precipitation events over the Arabian Gulf

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Center for Prototype Climate Modeling, New York University Abu Dhabi

**Abstract:** The mechanism of winter precipitation events over the Arabian Gulf is studied using available observations as well as high resolution atmospheric model simulations. It is found that, often the precipitation events over the southern Gulf result from the downstream development of precipitating disturbances over the northern Gulf. The northern Gulf receives ~5 times the precipitation occurrences over the southern Gulf during winter season. The location of low level jet is found to be crucial for the downstream development of the northern Gulf precipitation. Our analysis shows that the probability of the downstream development of northern Gulf event is higher when the jet is located equatorward of 27°N. The composites of local circulation and moisture transport during winter precipitation events over the southern Gulf are constructed. The moisture transport from the Arabian Sea is found to feed the rain events over the southern Gulf region.

### 3. Sea level rise primer for planners and decisionmakers in the UAE

J. Hinkel (Global Climate Forum), R. Arthur (American University of Ras Al Khaimah), Z. Edson Oceanography Institute at the University of Sao Paulo), B. Dougherty (Climate Change Research Group)

This poster reviews the outputs of the Sea Level Rise Primer, a study under AGEDI's Local, National, and Regional Climate Change Programme. With rising sea levels will come new challenges for planners and decision-makers in the UAE. Sea level rise will mean that tides, waves and storm surges can reach further inland than before, resulting in flooding, erosion, receding shorelines and the deterioration of groundwater quality. The vulnerability of coastal areas to rising seas depends on many factors including shoreline elevation, the topography of the land and the seabed, the presence of natural barriers, and other local characteristics. Other impacts of climate change, such as changing wind and rainfall patterns, will also come into play, such as more intense rainfall coinciding with storm surges, amplifying the impacts of rising seas.

This poster on the Sea Level Rise Primer explains how the Primer can support decision-making pertinent to sea level rise as it aims to be a helpful interface between sea level rise, a topic that is highly technical and multi-faceted, and decision-makers and other stakeholders in the UAE and the Arabian Gulf region who are interested in coastal development and protection. The focus is on three (3) key areas: Increasing the scientific understanding of what sea level rise is, how it is predicted, and the status of international research efforts to improve General Circulation models to adequately reflect atmosphere-ocean-ice dynamics; Identifying how sea level rise will impact vulnerable infrastructure in the Arabian Peninsula generally and the UAE specifically, on an emirate-by-emirate basis; and Laying out a range of planning tools and options (i.e., a planning toolkit) to assist planners in the efforts to integrate sea level rise considerations into maritime plans.

### 4. Implications of Food Security & Climate Change for the UAE

Bill Dougherty (Climate Change Research Group), and Patrick Keys (Keys Consulting)

This poster reviews the outputs of the Food Security & Climate Change study, conducted under AGEDI's Local, National, and Regional Climate Change Programme. The UAE is a country that is heavily dependent on food imports and may be vulnerable to food supply constraints and associated price shocks associated with climate change impacts in food-exporting countries. The combination of climate change-induced declining agricultural productivity in food-exporting countries, tightening of world food markets, and price speculation pressures could lead to several adverse circumstances in the UAE. These may include recurrent retail food price spikes and/or a need for substantial food subsidies. Households throughout the seven emirates that have annual incomes at the lower end of the national range could find themselves in a position where they would be subject to spending a growing share of limited household budgets for food.

This poster summarizes the overall results of this study which quantified the impact of climate change on long-term food security in the UAE on two levels. The "Macro" or national level addresses the interconnected issues of international food trade flows/constraints, and climate change impacts on agricultural productivity of food exporting countries. The "Micro" or household level addresses the economic vulnerability of UAE households to food price volatility resulting from the impact of macro-level considerations.

## 5. Public Health Co-benefits of Greenhouse Gas Mitigation in the Abu Dhabi Metropolitan Area

B. Dougherty (Climate Change Research Group), D. Yates (National Center for Atmospheric Research), P. Kucera (National Center for Atmospheric Research)

This poster reviews the outputs of the Health Co-benefits of GHG Mitigation study, conducted under AGEDI's Local, National, and Regional Climate Change Programme. There are strong linkages between greenhouse gas emissions that contribute to global climate change and air pollution that contributes to adverse local public health impacts. Activities that lead to greenhouse gas emission reduction can also simultaneously lead to air pollutant emissions and subsequently to the avoidance of adverse public health impacts. The driving research question was: "Are there significant public health co-benefits in the greater Abu Dhabi City metropolitan area associated with the emirate's Climate Change Strategy?" The study explored this question by developing an estimate of the number of avoided premature deaths and an estimate of the number of avoided excess health-care facility visits due to the comprehensive implementation the Abu Dhabi Climate Change strategy. This poster summarizes the overall results of this study which quantified the change in greenhouse gas emissions, changes in air quality of ozone and particulates, and resulting public health co-benefits.