

Local Climate Change Adaptation Measures in Hawaii

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Experts indicate that the direct impacts of climate change on Hawaii include sea level rise, increased frequency of extreme storm events, degradation of native ecosystems and ocean acidification. Of these, sea level rise presents the most immediate concern to coastal managers. The 2007 United Nations Intergovernmental Panel on Climate Change (IPCC) report notes the dangers facing island communities: "Sea-level rise is expected to exacerbate inundation, storm surge, erosion and other coastal hazards, thus threatening vital infrastructure, settlements and facilities that support the livelihood of island communities."

Estimates of the magnitude of sea level rise Hawaii will face in the next 40-50 years vary. The State of Hawaii's 2007 Multi-Hazard Mitigation Plan cites an estimate of 0.24 m mean sea level rise. However, the plan notes that for sandy shorelines a multiplier of 150 should be applied. Applying such a multiplier would result in retreat of 36 meters to some vulnerable beaches by mid-century.

Erosion and beach retreat associated with sea level rise – and amplified by seawalls and other beach protection structures – poses a major social, cultural and economic threat to the state. Hawaii's economy is highly dependent on the visitor industry, but the loss of vulnerable beaches is just part of the economic and social costs faced by the state. Critical coastal infrastructure, such as Honolulu's international airport, harbors, major highways and sewage treatment plants could be threatened by surges and periodic inundation.

To date, governmental responses have been incremental and focused primarily on beach erosion and the conventional designation of hazard zones. Current adaptation efforts include:

- Changes in coastal setback requirements;
- Beach nourishment;
- The mandated designation of flood hazard zones and more rigorous building codes;
- Beach management plans;



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- Conditions added to county coastal management permits.

Longer term adaptation efforts will require extensive technical analysis of the designation of potential inundation areas, impacts on ground water supply and habitats and the costs of protection and relocation of infrastructure and housing, commercial and industrial facilities. Identifying and addressing impacts of sea level rise will have enormous social and economic impacts.

Developing adaptation strategies that are regarded as both effective and legitimate will require both careful technical analysis and transparent deliberative processes involving experts, managers, politicians and citizens.