ADAPTATION ACTION AREAS

STRATEGY FOR IMPLEMENTATION PLANNING FOR SUSTAINABLE URBANIZATION

Various Approaches to Vulnerability Assessment

Kyoto University Project

Blitar Project

South Florida Regional Climate Compact

Hillsborough County, Florida

Adaptation Action Area Program, State of Florida

Climate Disaster Resilience Index: CDRI

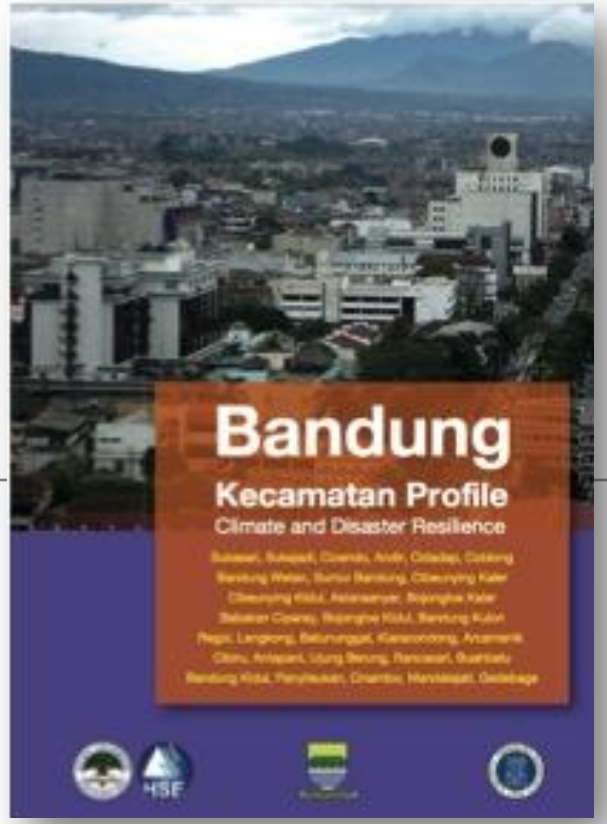
Methodology

Key Question: How to address climate disaster risk to understand the resilience of a city?

→CDRI tool: *5x5 matrix, 25 parameters integrating 125 variables*

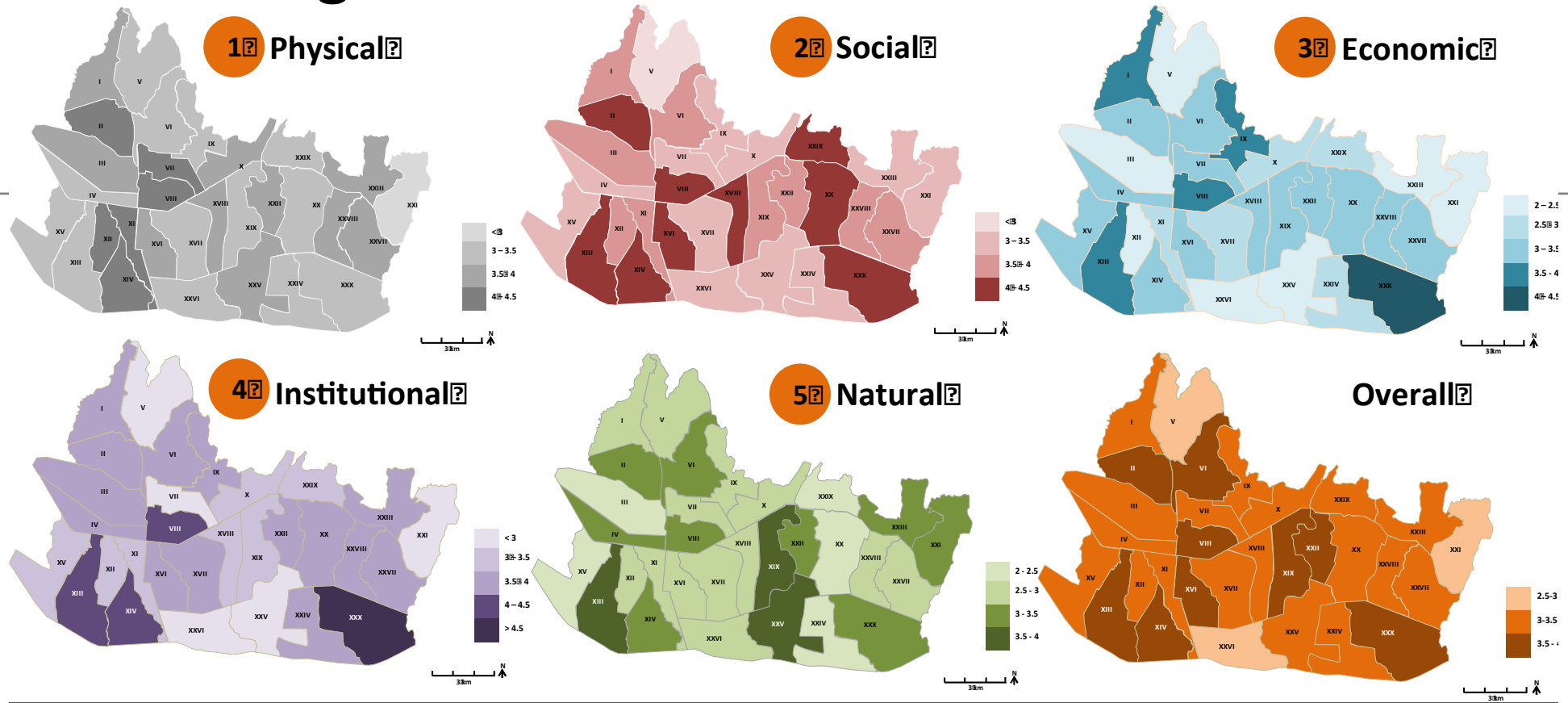
Analysis: *Weighted Mean Index*

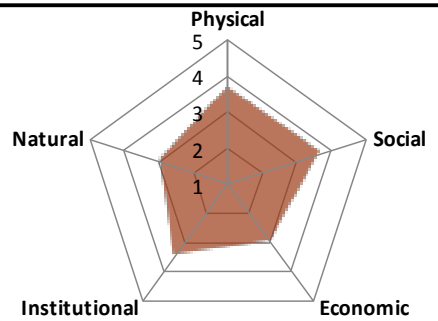
Climate and Disaster Resilience
Bandung City
Kecamatan Profile



No.	Sub-district	No. wards
1.	Sukasari	4
2	Sukajadi	5
3.	Cicendo	6
4.	Andir	6
5.	Cidadap	3
6.	Coblong	6
7.	Bandung Wetan	3
8.	Sumur Bandung	4
9.	Cibeunying Kaler	4
10.	Cibeunying Kidul	6
11.	Astanaanyar	6
12.	Bojongloa Kaler	5
13.	Babakan Ciparay	6
14.	Bojongloa Kidul	6
15.	Bandung Kulon	8
16.	Regol	7
17.	Lengkong	7
18.	Batununggal	8
19.	Kiaracondong	6
20	Arcamanik	4
21.	Cibiru	4
22.	Antapani	4
23.	Ujung Berung	5
24.	Rancasari	4
25.	Buahbatu	4
26.	Bandung Kidul	4
27.	Panyileukan	4
28.	Cinambo	4
29.	Mandalajati	4
30.	Gedebage	4

Bandung Climate Disaster Resilience





- Health, Electricity and Social Capital are **the highest parameter values**
- Finance and Savings, Frequency of Hazards, and Budget and Subsidy in DM are **the lowest parameter values**

Kyoto University

International Environment and Disaster Management
Graduate School of Global Environmental Studies

INTEGRATING CLIMATE VULNERABILITY & RISK ASSESSMENT INTO URBAN SPATIAL PLANNING PROCESS

(CASE STUDY: BLITAR CITY, EAST JAVA, INDONESIA)

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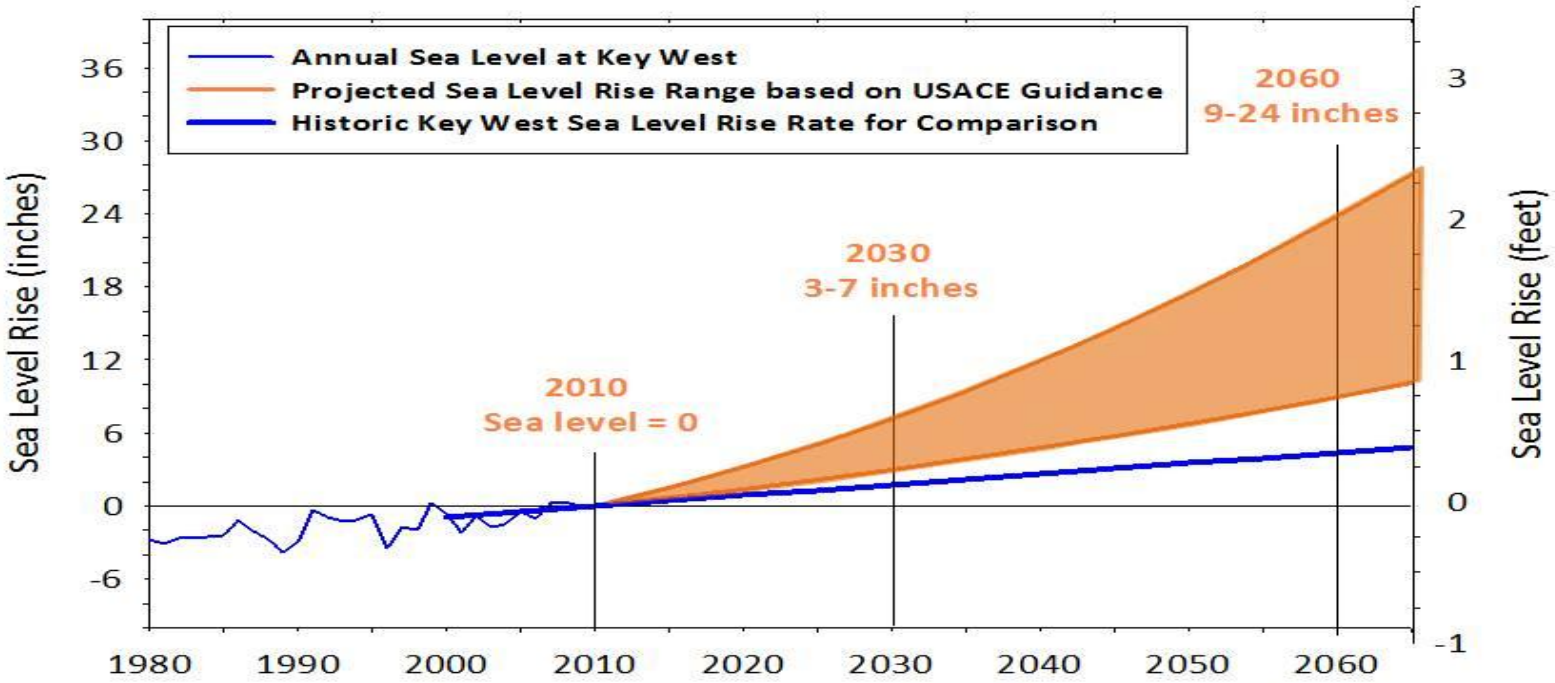
Climate Risk Assessment

- **Climate risk assessment (CRA) as a major input for climate change adaptation planning process can address climate change challenge.**
- **Cities can maintain its environment quality, livelihood, and sustainability.**
- **Many methods of CRA already developed by research organization and its result is used by city government to be integrated into urban spatial plan.**
- **The current methodology is less workable for governments official's with limited resources and capacity**
- **Integrated into spatial plan product, not the process, so there is no chance to improve urban spatial plan.**

"This research aims to analyze a potential integration between spatial planning and climate risk assessment in order to develop a better planning process that considering climate change measures and its impact."

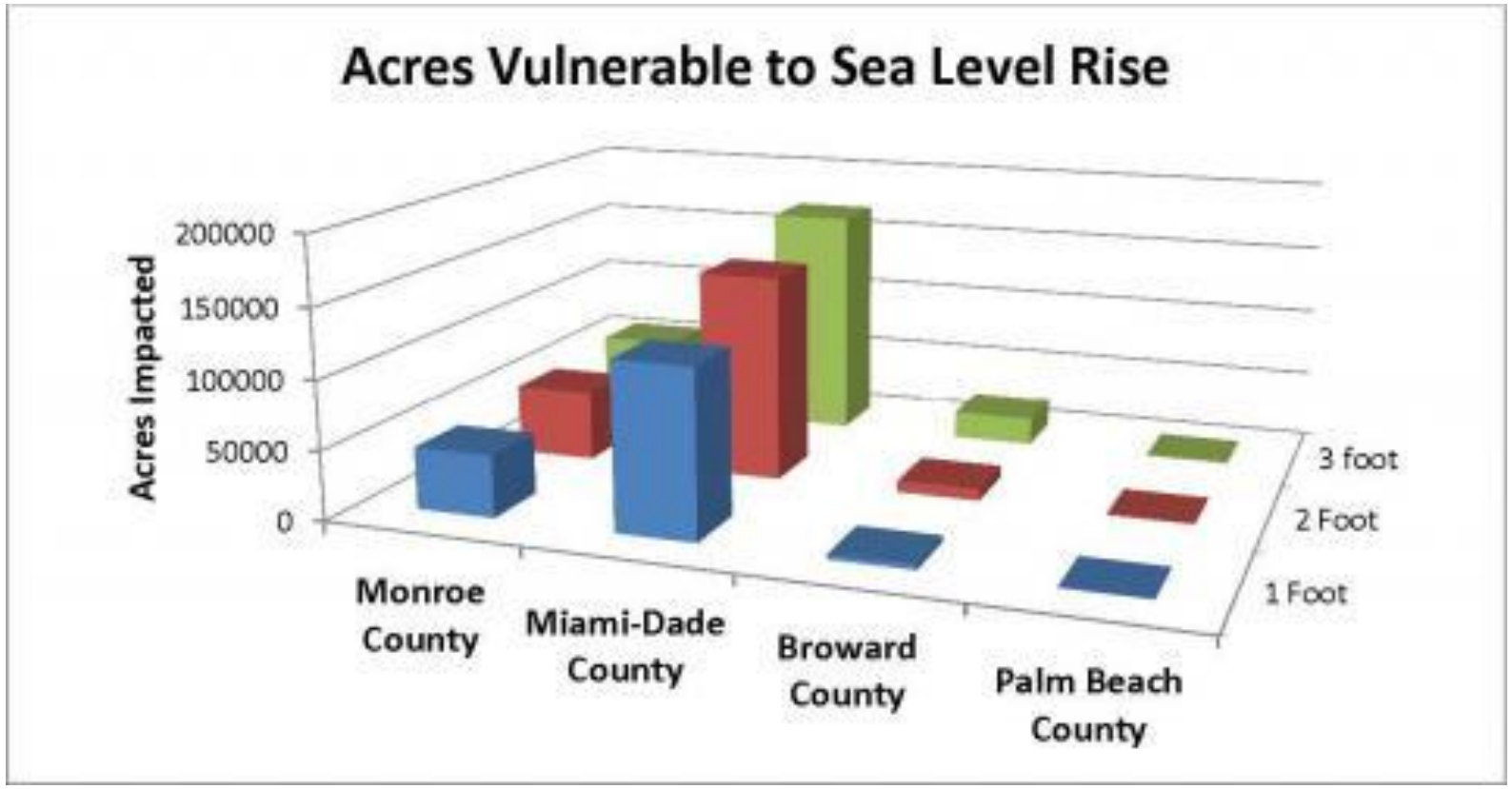
Southeast Florida Regional Climate Change Compact

The Southeast Florida Regional Climate Change Compact was executed by Broward, Miami-Dade, Monroe, and Palm Beach Counties in January 2010 to coordinate mitigation and adaptation activities across county lines. The Compact represents a new form of regional climate governance designed to allow local governments to set the agenda for adaptation while providing an efficient means for state and federal agencies to engage with technical assistance and support.

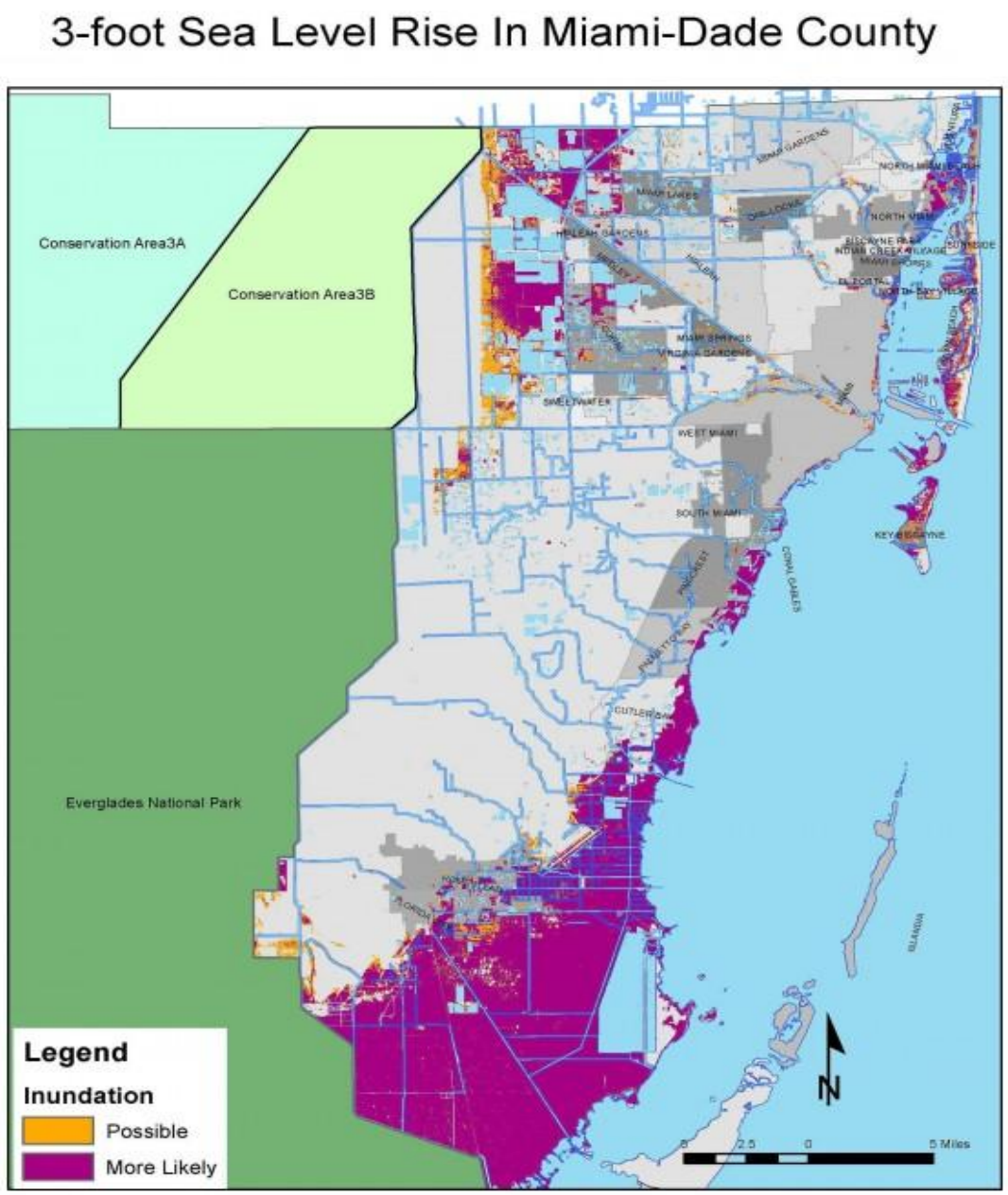


Unified Southeast Florida Sea Level Rise Projection for Regional Planning Purposes. This projection uses historic tidal information from Key West and was calculated by Kristopher Esterson from the United States Army Corps of Engineers using USACE Guidance (USACE 2009) intermediate and high curves to represent the lower and upper bound for projected sea level rise in Southeast Florida. Sea level measured in Key West over the past several decades is shown. The rate of sea level rise from Key West over the period of 1913 to 1999 is extrapolated to show how the historic rate compares to projected rates.

Vulnerable Areas – Southeast Florida



COASTAL FLOOD MAP Produced by NOAA



Annual Flooding in Miami

Flooding problem is not just the rain!

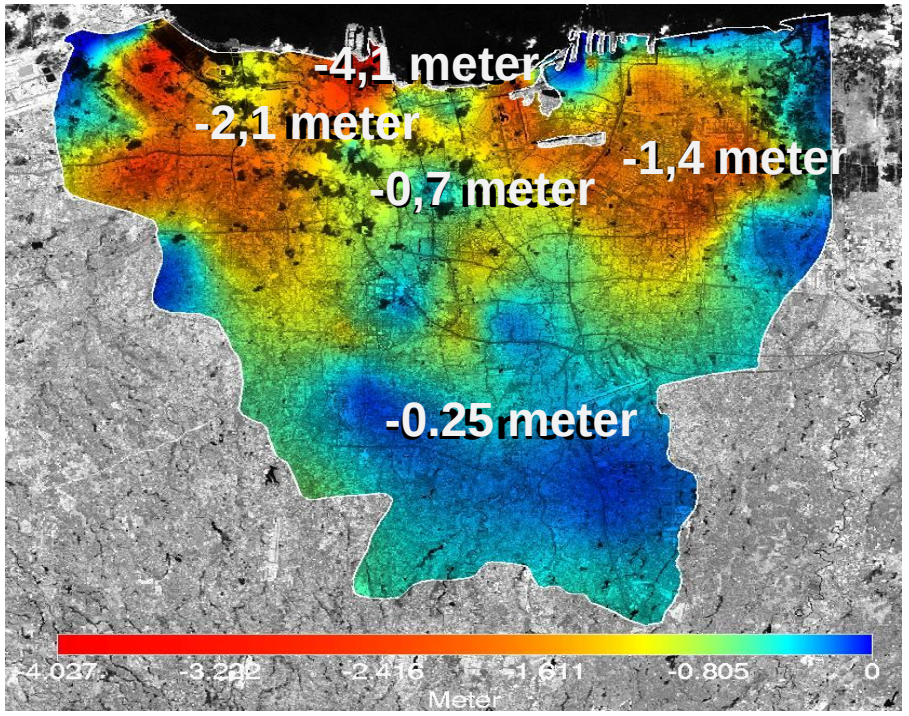
Subsidence Map

Subsidence map of Jakarta 1974-2010:

Total subsidence -25 up to -400 cm ; rate -0.5 up to -17 cm/year

First recorded of leveling data were in 1974. Base on acumulated data, interpolation and extrapolation we can make subsidence map of Jakarta from year 1974 up to 2010.

Base on latest analysis of piezometric surface data found that initial condition of subsidence were probably on 1965. In this case in the near future we will try to modeled subsidence map of Jakarta for year 1965 up to 2011



Ft. Lauderdale, Florida

Hillsborough County Climate Adaptation and Preparedness

Vulnerability Assessment and Adaptation Pilot Project

- focuses largely on impacts to transportation system of disaster, climate change, or other inundation events

- evaluation process begins with historical analysis to support risk scenarios, then data analysis, presentation to experts, stakeholders and citizens for feedback, and then conduct economic analysis

- focusing on are for potential disruption

- examining current and future mitigation projects (including cost)

- determine how to reduce vulnerability and develop a plan to address needed improvements

- extremely important to engage local stakeholders and create a ongoing advisory group

- build this effort into the county's comprehensive plan and further engage staff and public

Section 163.3177(6)(g)(10), Florida Statutes

At the option of the local government, develop an Adaptation Action Area designation for those low-lying coastal zones that are experiencing coastal flooding due to extreme high tides and storm surge and are vulnerable to the impacts of rising sea level. Local governments that adopt an Adaptation Action Area may consider policies within the coastal management element to improve resilience to coastal flooding resulting from high-tide events, storm surge, flash floods, stormwater runoff, and related impacts of sea-level rise. Criteria for the Adaptation Action Area may include, but need not be limited to, areas for which the land elevations are below, at, or near mean higher high water, which have a hydrologic connection to coastal waters, or which are designated as evacuation zones for storm surge.

Variations on Coastal Water Impacts

- **Mean sea level**: The height of the sea surface averaged over all stages of the tide over a period of time, typically computed over a 19-year period.
- **Sea-level rise**: An observed increase in the average local sea level or global sea level trend. The two major causes of global sea-level rise are thermal expansion caused by the warming of the oceans (since water expands as it warms) and the loss of land-based ice (such as glaciers and polar ice caps) due to melting.
- **Storm surge**: An abnormal rise of water generated by a storm, over and above the predicted astronomical tides. Storm surge should not be confused with storm tide, which is defined as the water level rise due to the combination of storm surge and the astronomical tide.
- **Stormwater runoff**: Is generated when precipitation flows over land or impervious surfaces and does not percolate into the ground. As the runoff flows over the land or impervious surfaces (paved streets, parking lots, and building rooftops), it accumulates pollutants that could adversely affect water quality if the runoff is discharged untreated.

Sea-Level Rise Adaptation Plans

Main and Supporting Components

1.Context

1.1.Assemble a Steering Committee
1.2.Identify Opportunities for Community Participation
1.3.Describe the Planning Context
1.4.Set Guiding Principles + Motivations

2.Vulnerability Assessment

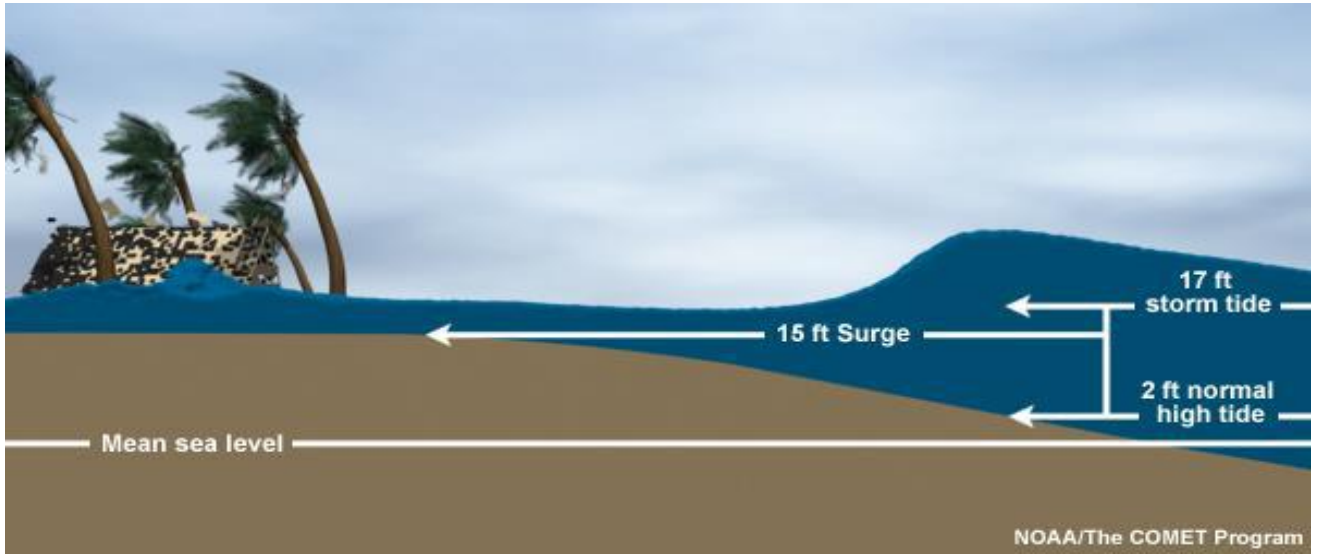
2.1.Conduct an Exposure Analysis
2.2.Conduct an Impact Analysis
2.3.Assess Adaptive Capacity

3.Adaptation Strategies

3.1.Assign Focus Areas
3.2.Identify Adaptation Strategies
3.3. Prioritize Adaptation Needs

4.Implementation Strategies

4.1.Survey Funding Options
4.2.Integrate into Existing Plans
4.3.Create a Schedule of Activities
4.4.Monitor and E valuation



AAA Steps to Become More Resilient

Protection – hard and soft structural defensive measures

Accommodation – alter the design through elevation or stormwater impovements

Managed Retreat – removal of existing development through relocation to other areas

Avoid – ensure development does not take place in areas subject to coastal hazards

Meaning of Green Infrastructure

Green infrastructure uses vegetation, soils, and natural processes to manage water and create healthier urban environments. At the scale of a city or county, green infrastructure refers to the patchwork of natural areas that provides habitat, flood protection, cleaner air, and cleaner water. At the scale of a neighborhood or site, green infrastructure refers to stormwater management systems that mimic nature by soaking up and storing water.

- Downspout Disconnection
- Rainwater Harvesting

- Rain Gardens
- Planter Boxes
- Bioswales
- Permeable Pavements
- Green Alleys and Streets
- Green Parking
- Green Roofs
- Urban Tree Canopy
- Land Conservation

Tools to Support AAAs (1)

Zoning and Overlay Zones

Floodplain Regulations

Building Codes and Design

Setbacks and Buffers

Incentives

Hard and Soft Armoring Permits

Conditional Development

Rebuilding Restrictions

Transferable Development Rights

Tools to Support AAAs (2)

Stormwater Utility

Special Assessments

Impact Fees

Conservation Easements

Real Estate Disclosures

Coastal Land Acquisition Programs and Land Trusts

Coastal Community Task Force

Adaptation Outreach Campaign

Green Infrastructure

Green infrastructure policies

Validation programs

Green Streets

Rainwater harvesting

Tactical Urbanism - PARK (ing) Day; Guerrilla Gardening; City Repair Project

Pilot Projects