Georgia Institute of Technology

CORE MPO Climate Change and Adaptation Workshop

Climate Risk Matrix and Potential Adaptation Strategies

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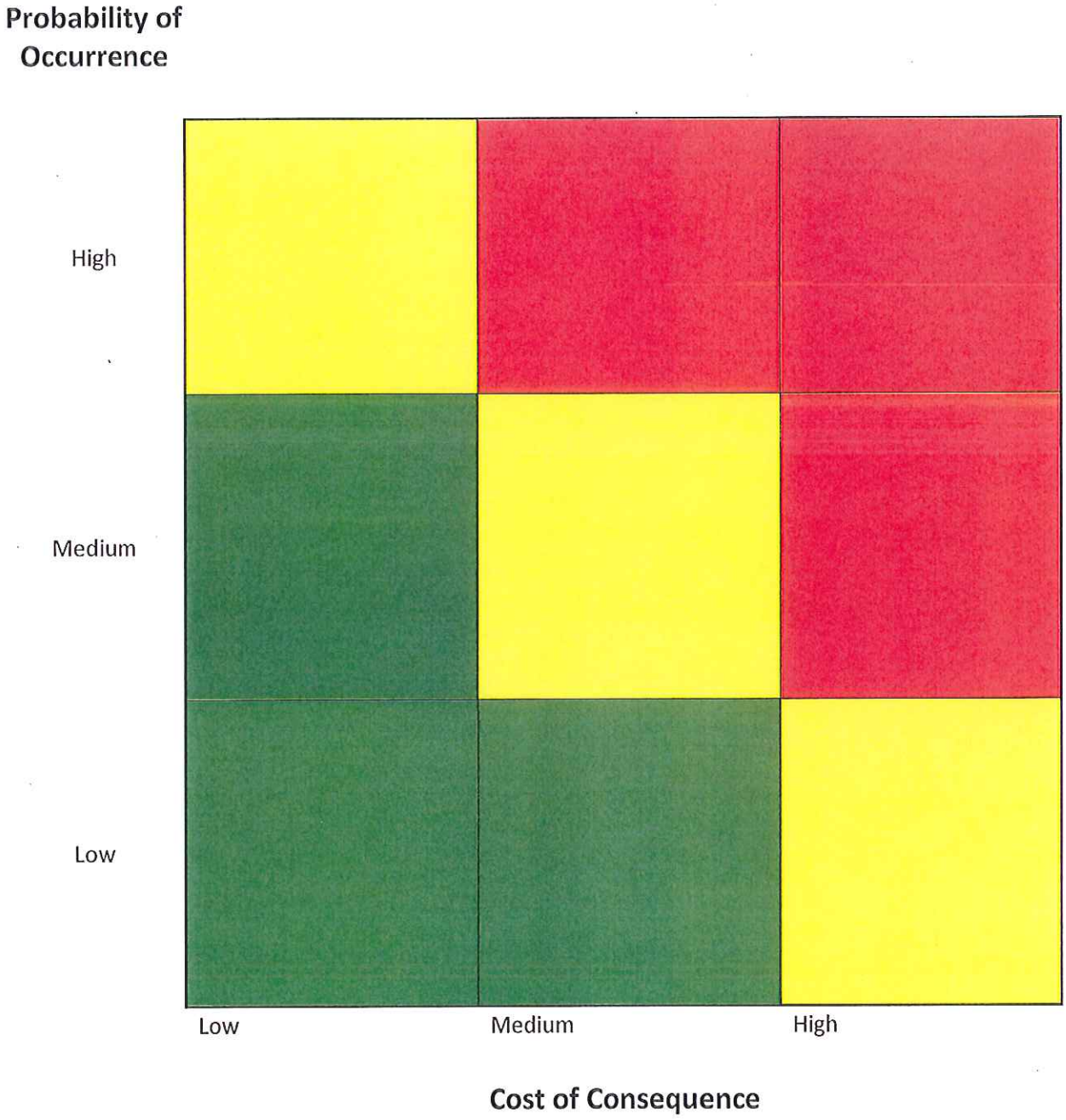
4/2/2013

Table 1 – Illustrative Listing of Climate Impacts and Adaptation Strategies

Impact Category	Adaptation Strategies
Precipitation: accelerated asset deterioration	• Conduct early vulnerability assessments • Give greater weight to potential for ground subsidence in design of infrastructure • Accelerate replacement cycles • Shift to materials with greater resistance to moisture and heat/cold cycles • Incorporate design features such as increased pavement sloping to improve resistance to precipitation
Precipitation and sea level rise: Increased incidence of flooding events	• Re-site or floodproof infrastructure • Greater protections and construction limitations for floodplains and coastal areas.
Precipitation: Water scarcity and loss of winter snowpack	• Shift to less water-intensive construction methods • Shift ROW plantings to drought-resistant species and designs that reduce runoff
Precipitation: Increased incidence of wildfires	• Vulnerability assessments incorporated in infrastructure location decisions • Use of fire-resistant construction materials and landscaping
Precipitation: Shift in ranges of endangered species	• Keep abreast of ecological studies on a regional basis to detect observed shifts in habitat.
Temperature: Arctic asset and foundation deterioration	• Install insulation or cooling systems in roadbeds to prevent thawing • Relocate facilities to more stable ground • Remove permafrost before construction for new facilities
Temperature: Increase in the frequency and severity of heat events	• Plan for more frequent maintenance • Use of heat-resistant roadway materials • Greater use of expansion joints in roadways, bridges, and rail guideways.
Temperature: Reduction in frequency of severe cold	• Capitalize through the extension of construction and maintenance season
Sea level rise: Inundation of infrastructure	• Relocate assets • Develop redundancy in travel routes near the shoreline • Disinvest in infrastructure too costly to protect • Elevate or hardscape the most critical infrastructure • Expand drainage and pumping capacity
Sea level rise: Storm surges	• Protective designs] • Relocation of facilities
More intense weather events: Damage to assets	• Retrofit assets early for greater resistance to extreme weather • Incorporate storm resistant features into future designs • Minimize water-impervious surfaces in designs and design infrastructure to slow run-off from heavy rain events
More intense weather events: Increased frequency of road traffic disruption, including interruption of emergency routes	• More stringent design, operations standards • Develop redundancy in travel routes near the shoreline • Elevate or hardscape the most critical infrastructure • Create Transportation Management Centers, improve monitoring of conditions and real-time information made available to the public • Greater emphasis on emergency evacuation procedures, making them routine
Increased planning, construction, or operating costs due to climate change legislation	• Early adoption of energy-saving measures to minimize the impacts of rising energy costs
Organizational adjustments (replace outmoded procedures, acquire new competencies)	• Conduct early reevaluation of procedures in advance of new requirements

Potential Climate Change Impacts
Risk Matrix



Potential Climate Impacts	Adaptation Strategies	
	Short-term	Long-term

Savannah/Chatham County Climate Projections

Table 2 – Savannah Area Summer Temperature and Precipitation Projections

Savannah Region (Chatham County) Summer (June, July, & August) Temperature & Precipitation Projections				
A1FI Emissions Scenario Ensemble "High Emissions"				
Time Horizon	1981-2010	2010-2039	2040-2069	2070-2099
Mean Temp °F	81.3	83.3	86.4	88.7
Mean Days Over 90°F	56.3	90.8	92.0	92.0
Mean Max Consecutive Days Over 90°F	N/A	66.5	91.0	91.0
Mean Days Over 100°F	1.8	10.20	37.80	70.8
Mean Max Consecutive Days Over 100°F	N/A	3.25	6.80	33.8
Mean Max Daily (cumulative 24 hr.) precip (in.)	5.41	6.35	7.26	6.64
Mean Days with 1" or more precip	5.4	18.0	22.1	25.1
A2 Emissions Scenario Ensemble "Moderate Emissions"				
Time Horizon	81.3	83.2	85.2	87.1
Mean Temp °F	56.3	91.9	92.0	92.0
Mean Days Over 90°F	N/A	89	91.0	91.0
Mean Max Consecutive Days Over 90°F	1.8	27.30	57.2	85.0
Mean Days Over 100°F	N/A	5.60	17.2	32.4
Mean Max Consecutive Days Over 100°F	5.41	6.43	6.84	6.64
Mean Max Daily (cumulative 24 hr.) precip (in.)	5.4	33.6	36.7	35.60
Mean Days with 1" or more precip	81.3	83.2	85.2	87.1
B1 Emissions Scenario Ensemble "Low Emissions"				
Time Horizon	81.3	83.3	84.0	84.6
Mean Temp °F	56.3	92.0	92.0	92.0
Mean Days Over 90°F	N/A	91.0	91.0	91.0
Mean Max Consecutive Days Over 90°F	1.8	30.0	39.2	54.3
Mean Days Over 100°F	N/A	9.50	8.00	22.00
Mean Max Consecutive Days Over 100°F	5.41	7.29	6.27	7.28
Mean Max Daily (cumulative 24 hr.) precip (in.)	5.4	33.9	35.1	35.70
Mean Days with 1" or more precip	81.3	83.3	84.0	84.6

Table 3 – Savannah Area Winter Temperature & Precipitation Projections

Savannah Region (Chatham County) Winter (December, January, & February) Temperature & Precipitation Projections				
A1FI Emissions Scenario Ensemble "High Emissions"				
Time Horizon	1981-2010	2010-2039	2040-2069	2070-2099
Mean Temp °F	51.4	52.3	54.2	56.2
Mean Freezing Days (Low <= 32°F)	19.5	52.1	41.2	30.2
Mean Max Consecutive Freezing Days	N/A	18.5	2.16	9.6
Mean Max Daily (cumulative 24 hr.) precip (in.)	3.30	3.17	3.14	3.08
Mean Days with 1" or more precip	2.6	9.41	7.97	7.79
A2 Emissions Scenario Ensemble "Moderate Emissions"				
Time Horizon	1981-2010	2010-2039	2040-2069	2070-2099
Mean Temp °F	51.4	52.4	53.8	55.7
Mean Freezing Days (Low <= 32°F)	19.5	76.0	67.1	55.0
Mean Max Consecutive Freezing Days	N/A	19.6	19.3	11.5
Mean Max Daily (cumulative 24 hr.) precip (in.)	3.30	3.78	3.82	3.66
Mean Days with 1" or more precip	2.6	17.5	19.6	21
B1 Emissions Scenario Ensemble "Low Emissions"				
Time Horizon	1981-2010	2010-2039	2040-2069	2070-2099
Mean Temp °F	51.4	52.2	53.0	53.5
Mean Freezing Days (Low <= 32°F)	19.5	76.5	72.7	69.9
Mean Max Consecutive Freezing Days	N/A	16.7	39.8	15.7
Mean Max Daily (cumulative 24 hr.) precip (in.)	3.30	3.37	3.49	3.70
Mean Days with 1" or more precip	2.6	20.4	20.0	20.4