“Sed si qui voluerit diligentius haec sensu percipere, animadvertat attendatque naturas avium et piscium et terrestrium animalium, et ita considerabit discrimina temperaturae. aliam enim mixtionem habet genus avium, aliam piscium, longe aliter terrestrium natura.”

SEA LEVEL RISE SUMMIT 2016

“The overall costs and risks of climate change will be equivalent to losing at least 5% of global GDP each year, now and forever. In contrast, the costs of action – reducing GHG to avoid the worst impacts of climate change – can be limited to around 1% of global GDP each year.”
Key risks for South Florida

Flood damage
Erosion damage
Heat impacts
Increased water demand
Increased energy demand
Disruption/damage to transportation infrastructure
Disruption/damage to storm sewer and flood control infrastructure
Key risks for South Florida

Grade: habitable elevation

Water table: Groundwater datum

Built environment and geohydrology system SE Florida diagrammatic section: Anthony Abbate.
School of Architecture, Broward Community Design Collaborative.
Key risks for South Florida

Grade: habitable elevation

Water table: Groundwater datum

Built environment and geohydrology system SE Florida diagrammatic section: Anthony Abbate, School of Architecture, Broward Community Design Collaborative.
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School of Architecture, Broward Community Design Collaborative.
Response to climate change

“Building designs, codes and infrastructure shall accommodate 3’ of sea level rise.”
Response to climate change

Adapt
Mitigate
Retreat

Necessity for engagement and collaboration across the design, development, and construction industry.
Response to climate change

Adapt: accommodate natural changes and processes
Mitigate: reduce impacts of change
Retreat: abandon and relocate

Scale
Timeline
Feasibility
Cost

Necessity for engagement and collaboration across the design, development, and construction industry.
Response to climate change

Ecological and creative processes

Collaboration that engages science and creativity
Construction of the Las Olas Isles. Photo source: Fort Lauderdale Historical Society, Inc.
Scale: REGION

“The global costs of protecting the coast with dikes are significant but much smaller than the global cost of avoided damages even without accounting for indirect costs of damage to regional production supply.”

Investment for infrastructure to support transportation, utilities, and services

Incentives for adaptation or relocation.
Grade: habitable elevation

Water table: Groundwater datum

Built environment and geohydrology system SE Florida diagrammatic section: Anthony Abbate.
School of Architecture. Broward Community Design Collaborative.
Adaptation strategies for Delray Beach Study Area. SE Florida Regional Compact. South Florida Resilient Redesign. 2015.
Scale: SITE

Adaptation strategies for Delray Beach Study Area. SE Florida Regional Compact. South Florida Resilient Redesign. 2015.
Costs do not include design, state and local permit and application fees.
Florida Department of Environmental Protection. Division of Land and Recreation. Office of Coastal and Aquatic Managed Areas. SE Florida Aquatic and Buffer Preserves. 2000

Scale: SITE

Cost of protection versus cost of floods

Sea walls
$ 160 - $ 210 per lineal foot
20-25 year lifespan

Natural shoreline
$ 70 - $ 90 per lineal foot
Lifespan depends on health of ecosystem and maintenance
Scale: SITE

Non-vehicular access strategies
Raise access ways and habitable floor areas
Increase flood elevations and freeboard heights
Increase onsite storm water storage capacity
Convert site edges to managed wetlands
Increase onsite density
Photo: Anthony Abbate. NE 4th Street. Delray Beach, Florida. 2015.
Scale: BUILDING

Scale: BUILDING

Carbon neutrality
Resilient structures

Planning
Products
Design

Net Zero: living-future.org/netzero
Architecture 2030: architecture2030.org
### Site and building assessment and climate change response table.

<table>
<thead>
<tr>
<th>RISK</th>
<th>STRATEGY</th>
<th>COST</th>
<th>IMPLEMENTATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flood risk</td>
<td>Waterproofing measures</td>
<td>$300,000</td>
<td>2020</td>
</tr>
<tr>
<td>Stress on water resources</td>
<td>Awareness and education</td>
<td>$50,000</td>
<td>Now</td>
</tr>
<tr>
<td></td>
<td>Water efficient fixtures</td>
<td>$10,000</td>
<td>Now</td>
</tr>
</tbody>
</table>
Building Construction

Weatherproofing
Detailing
Materials

Impact of storms and flooding
Impact of higher temperatures
Weatherproofing
Weatherproofing

Moisture resistant materials
Corrosion resistant reinforced concrete
Flood tolerant materials
Electrical and building service system protection
Detailing
Detailing

Greater levels of thermal expansion of metals
Increased saturation of exterior finish materials
Increased rain penetration
Façade erosion
Warping of wood materials
Effects of hot-dry and hot-wet cycles
Increased wind-speeds
Materials

Materials

Building component life-cycle
  Structure
  Services
  Skin
  Interiors

Maintenance
Renewable and recyclable materials
Climate and weather resistive materials