Sea level rise and the built environment: Expected impacts & solutions

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Sea level rise and the built environment: Expected impacts and solutions

- BACKGROUND
- DEFINITIONS
- WHAT IS MISSING IN THE CONVERSATION?
- TOWARD RESILIENCE
- FOCUS ON THE IMPACTS
- POSSIBLE SOLUTIONS
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VULNERABILITY

- Interaction of human activity with hazards
- Dynamic interactive process
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HAZARD

- Source of potential damage
- Consists of damaging components
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**DAMAGE**

- Adverse consequence from a hazard
- Direct, indirect, or consequential
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BUILT ENVIRONMENT

- Shelter for human activity
- Continuity of function
- Interdependency with natural environment
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RESILIENCE

- It is about elasticity, bouncing back
- Continuity of function
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ENHANCING THE CONVERSATION!
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Incorporate these criteria in conversation:

- **Sea level RUN**: horizontal component ~ 200:1
- **A BAND not a line (of risk)**: water meets land
- **A moving target**: need a temporal component
- **Mitigation vs adaptation**: different timelines
- **Exclamation points!**: exacerbation of other impacts
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Incorporate exclamation points in conversation:

- **Storm surge**: water-depth dependent
- **Wave impact**: water-depth dependent
- **Extreme rain events**: water-depth dependent
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How do we achieve a resilient built environment in the Estero Bay region, in the context of sea level rise?
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Characterize expected impacts over projected service life of buildings and supporting infrastructure!
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THE SILENT KILLER: seepage, salt-water intrusion

- Raises water table
- Water-logged soils
- Damage to landscaping
- Weakens roadways and infrastructure
- Degrades functionality of septic systems
- Chloride corrosion – Structural damage
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THE SILENT KILLER: seepage, salt-water intrusion
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STORM SURGE – WAVE IMPACT
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POSSIBLE SOLUTIONS: Natural, soft mitigation
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POSSIBLE SOLUTIONS: Based on design criteria

- Forward-looking design paradigm
- Cut-off walls
- Sea walls (except in sandy beaches)
- Surge/wave deflectors
- Alternative waste-water treatment
- Building/infrastructure elevation
- Water relocation and storage (temporary)
- Building/infrastructure relocation
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POSSIBLE SOLUTIONS:

REGIONAL PROTECTION

- Longshore sand transport
- Ecosystem protection
- Turtle nesting
- Navigation
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How much time do we have?

How much time can we buy?