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Sea Level Rise What Should We Anticipate?

AVICC AGM – 14 April 2018





Outline

Global SLR Scenarios

BC Sea Level Rise

What does this mean for BC Coastal Communities

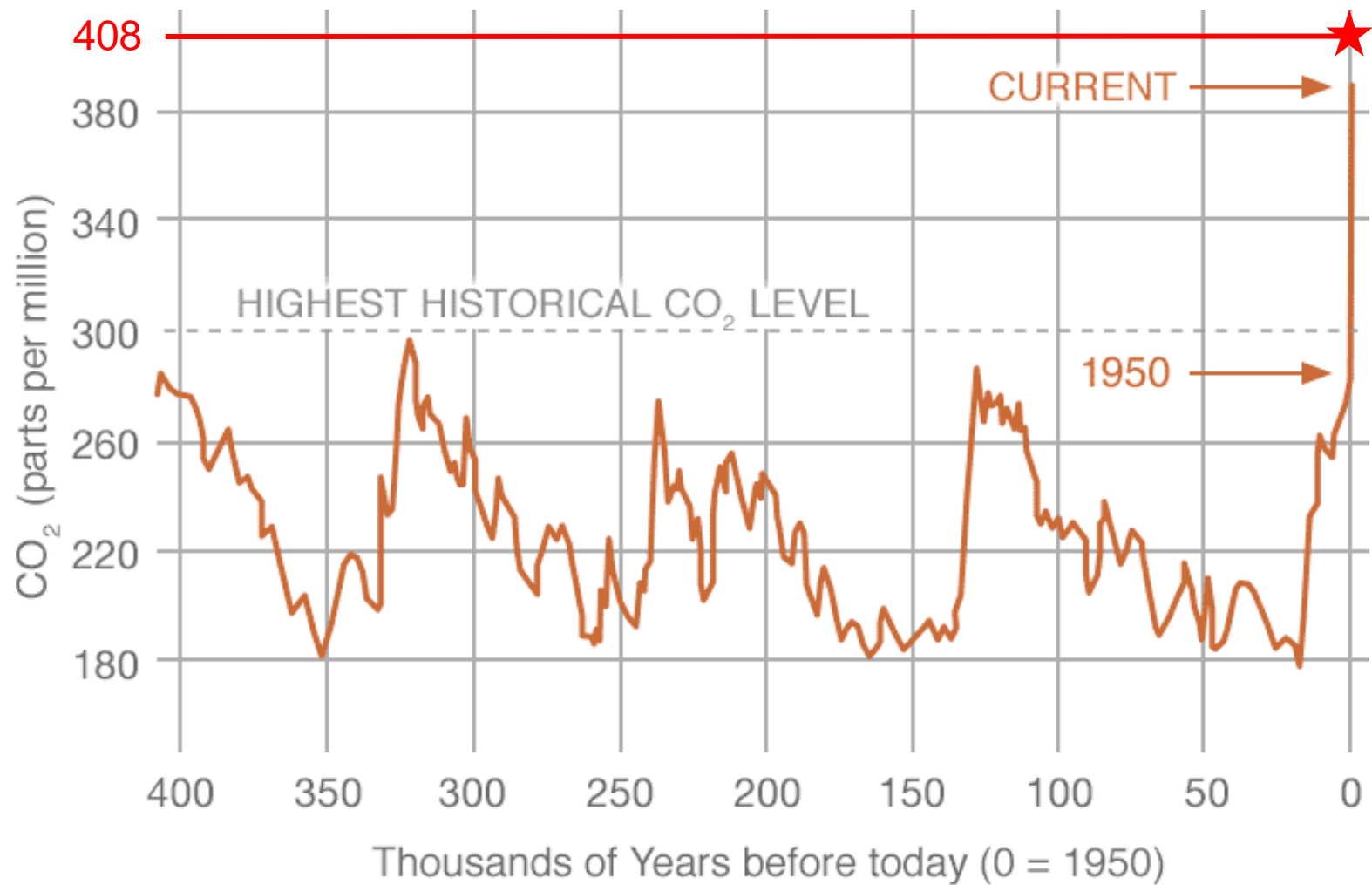


The slide features a white background with two large, overlapping blue geometric shapes on the left side. The top shape is a lighter blue triangle pointing downwards, and the bottom shape is a darker blue triangle pointing upwards. They meet at a diagonal line.

Global Sea Level Rise

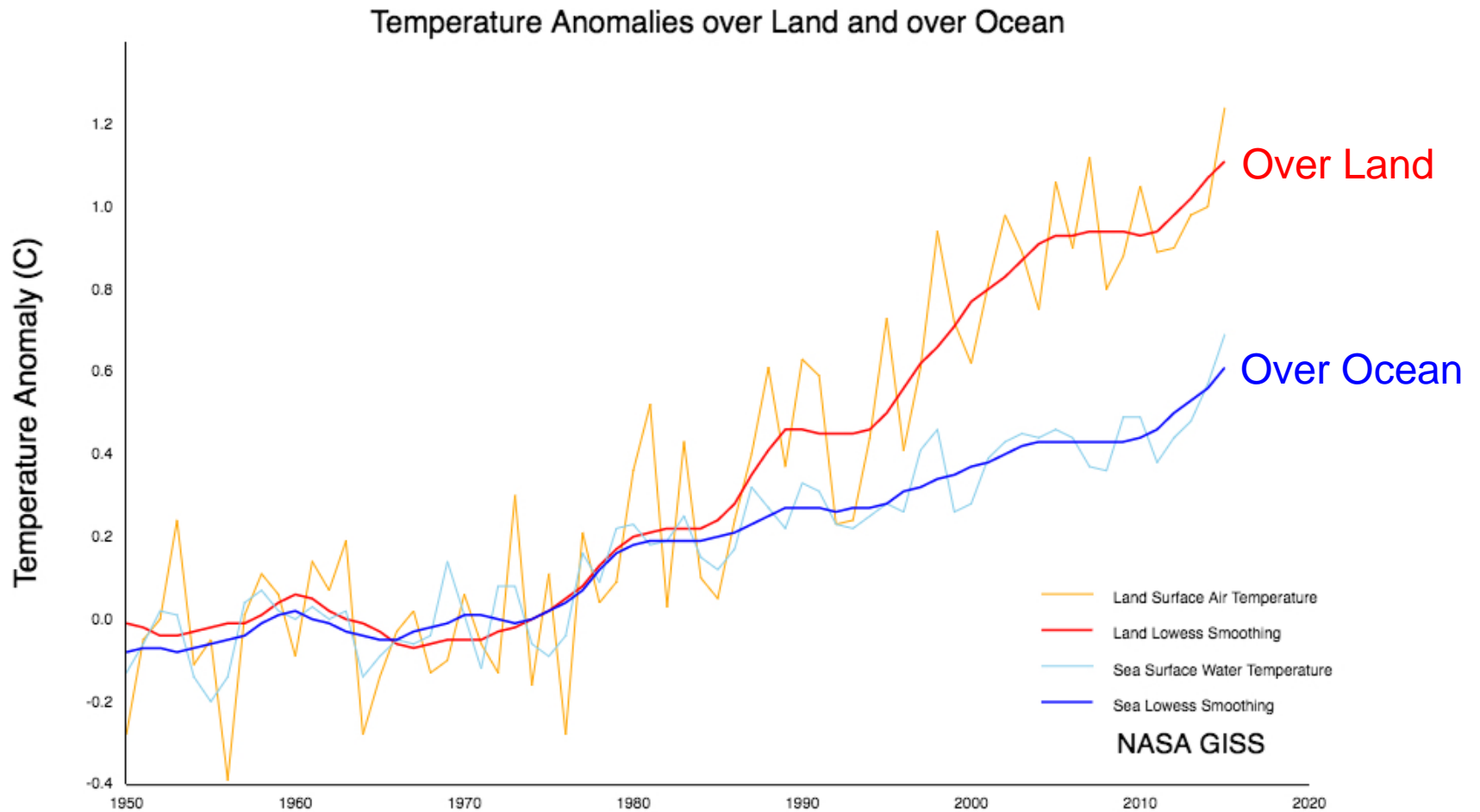


CO₂ Background





Present Temperature Trends



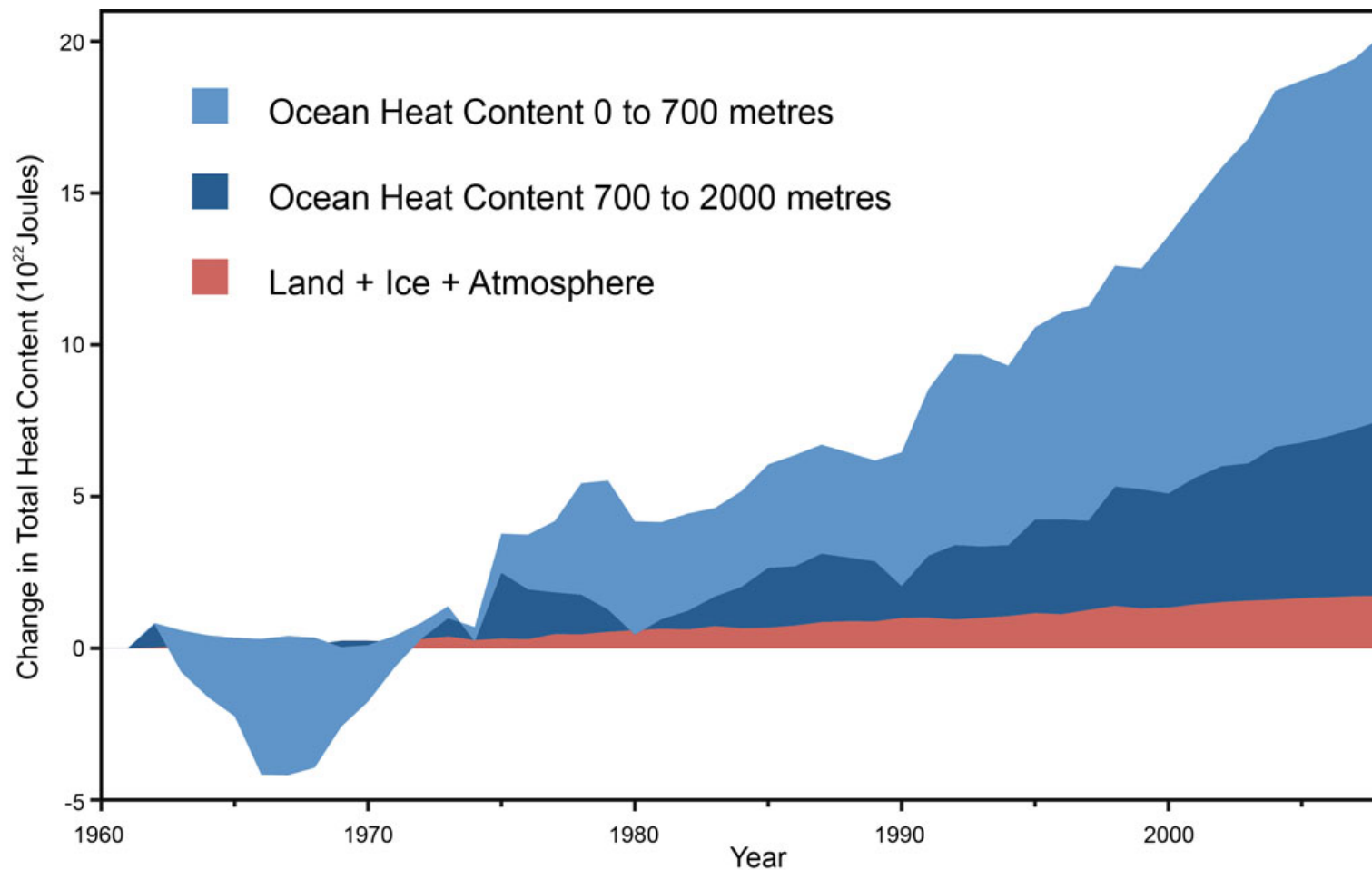
Credit: NASA GISS (October 2016)



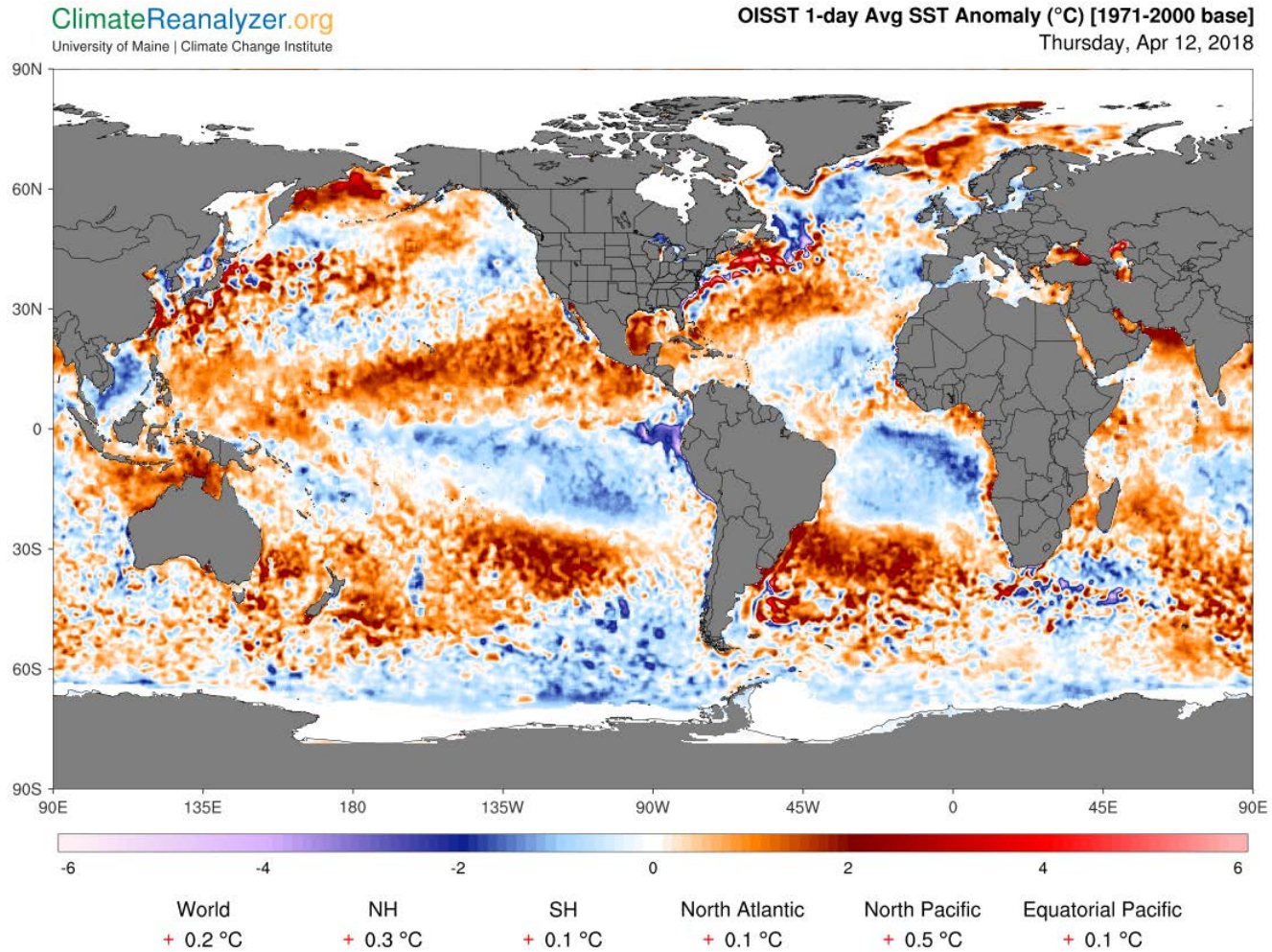
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Heat (Energy) Content

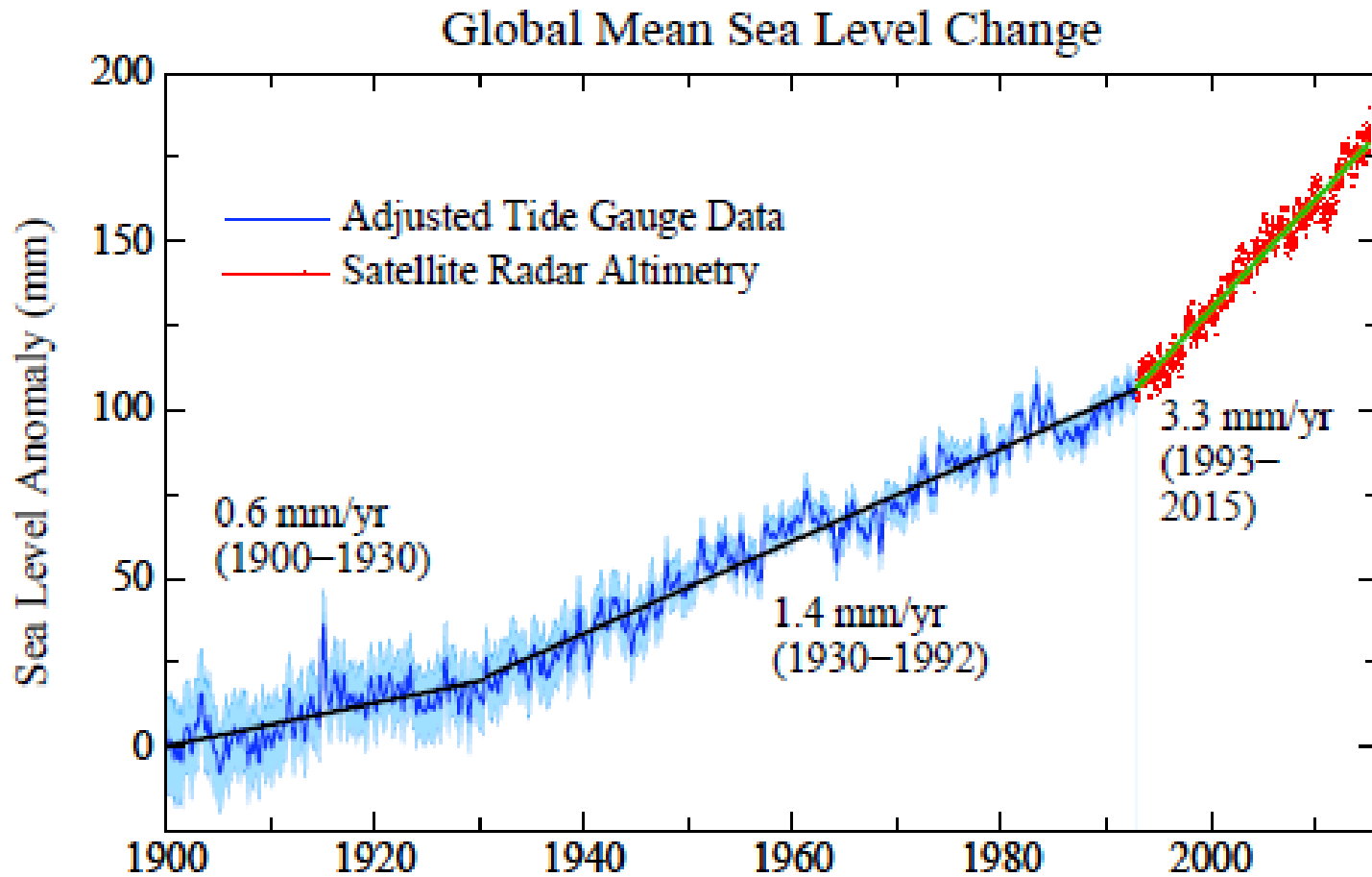


Ocean Temperature Anomalies





Historical Pace of Global SLR

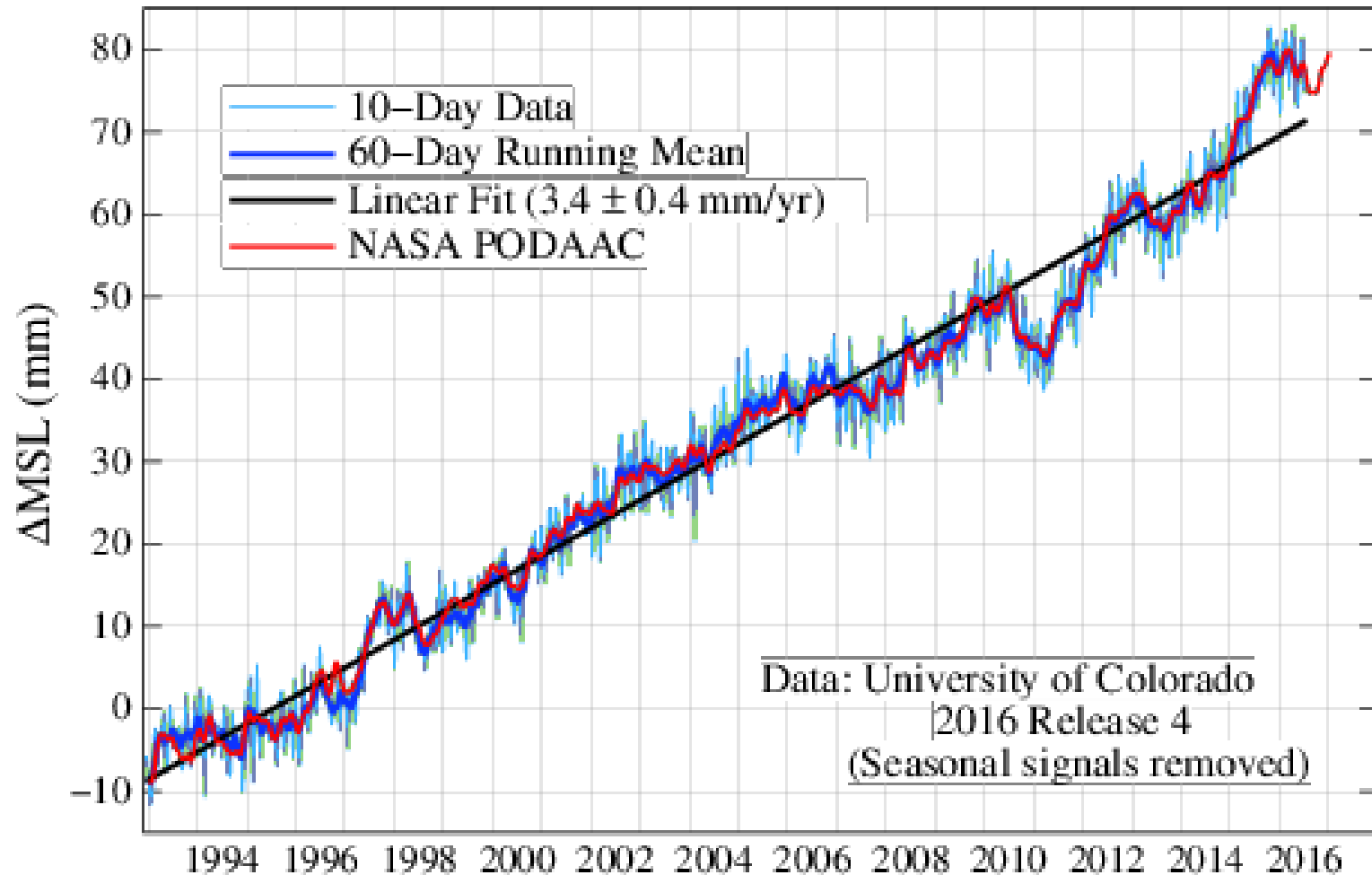


From Hansen et al (2015) – reflecting work by Hay et al (2015)



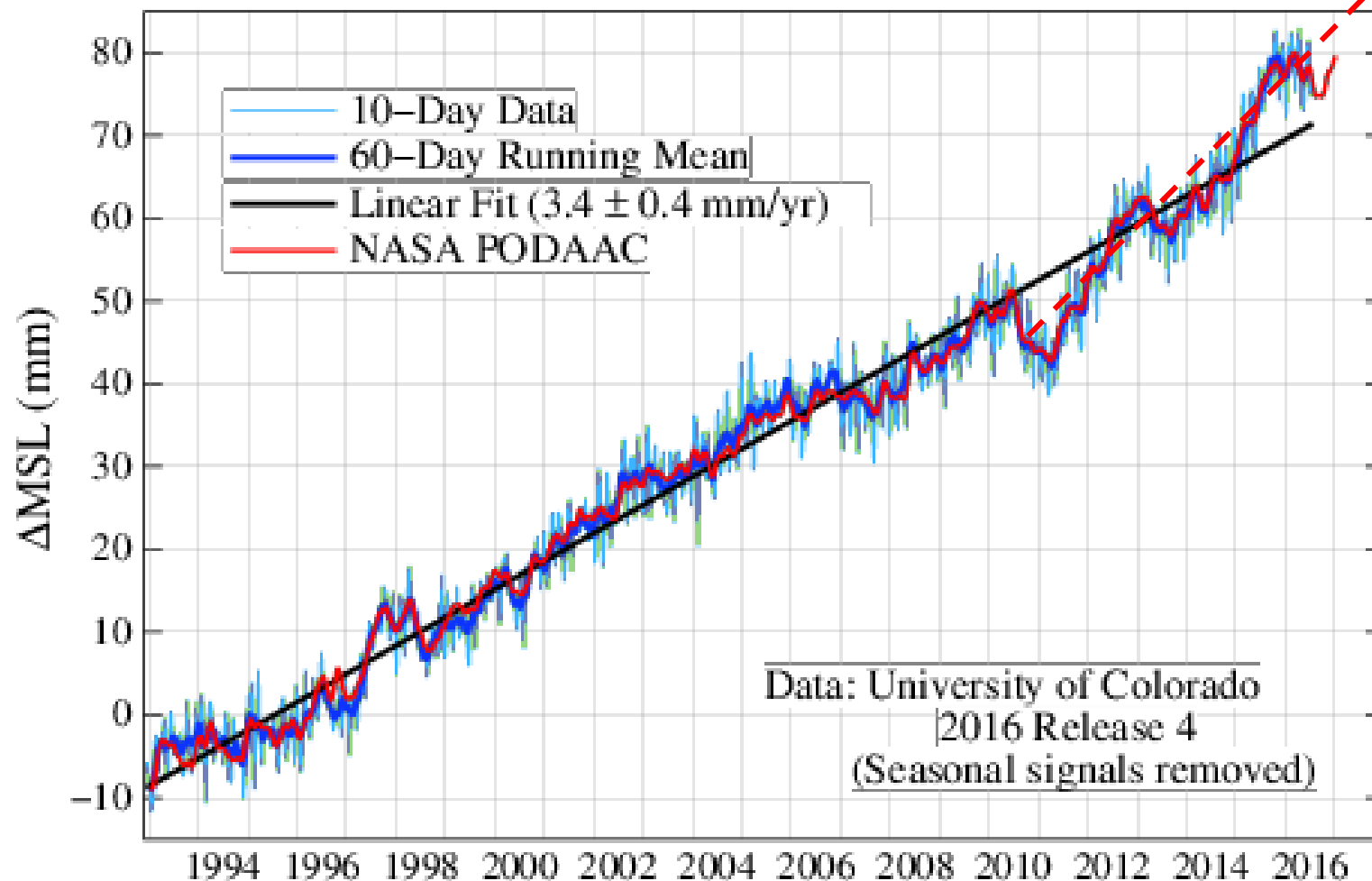
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Recent Global Mean Sea Level Rise

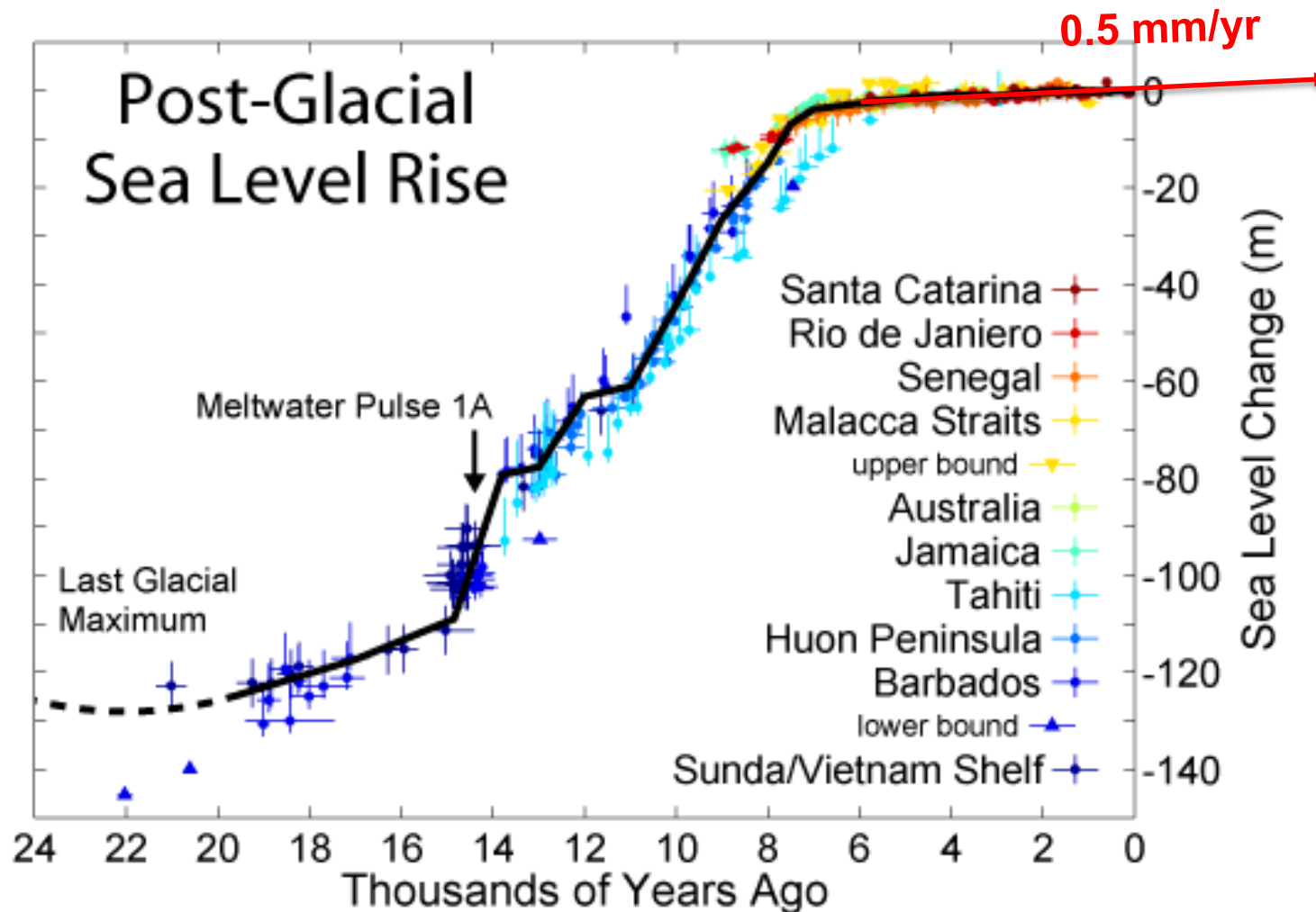


Recent Global Mean Sea Level Rise

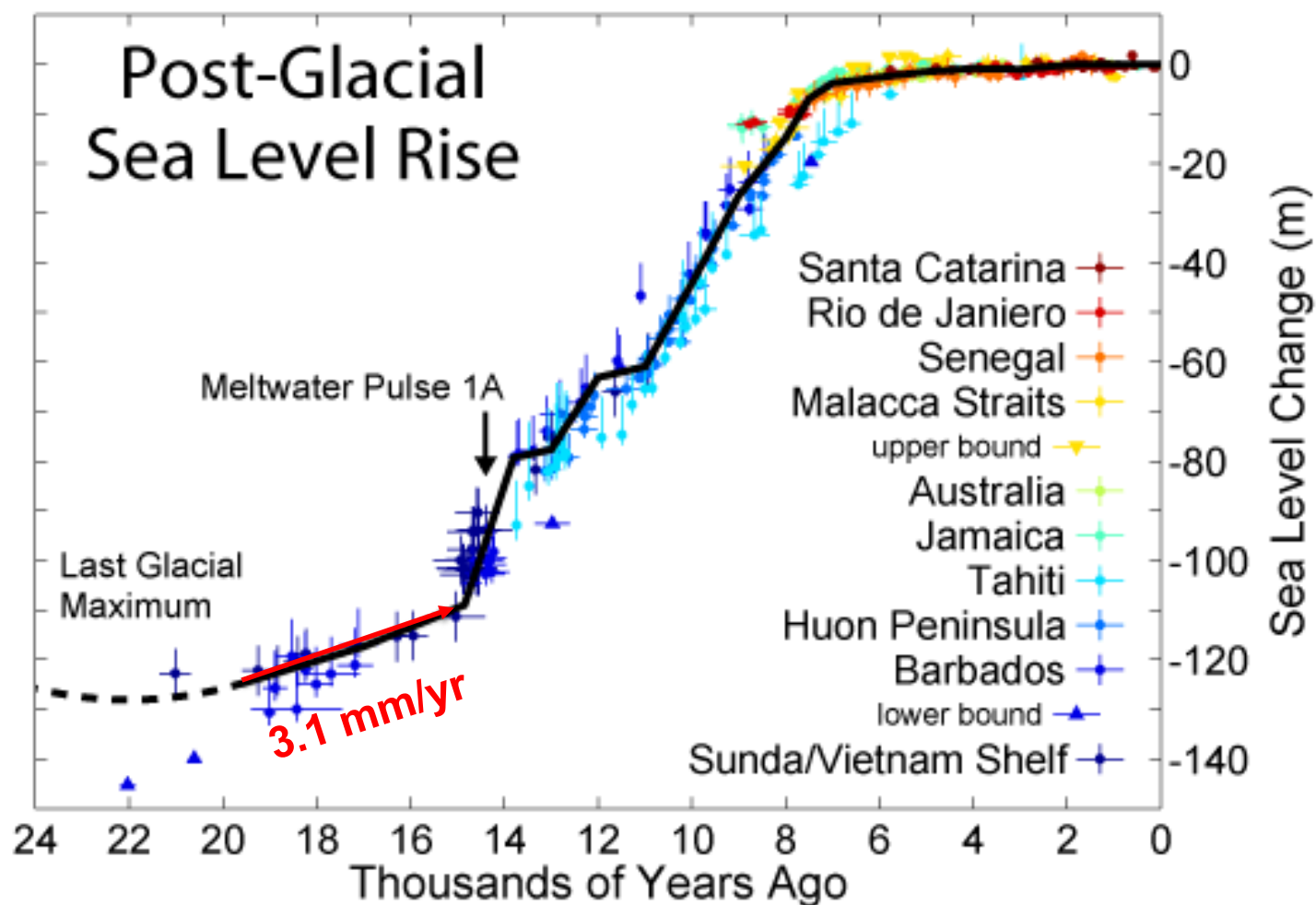
6 mm/yr



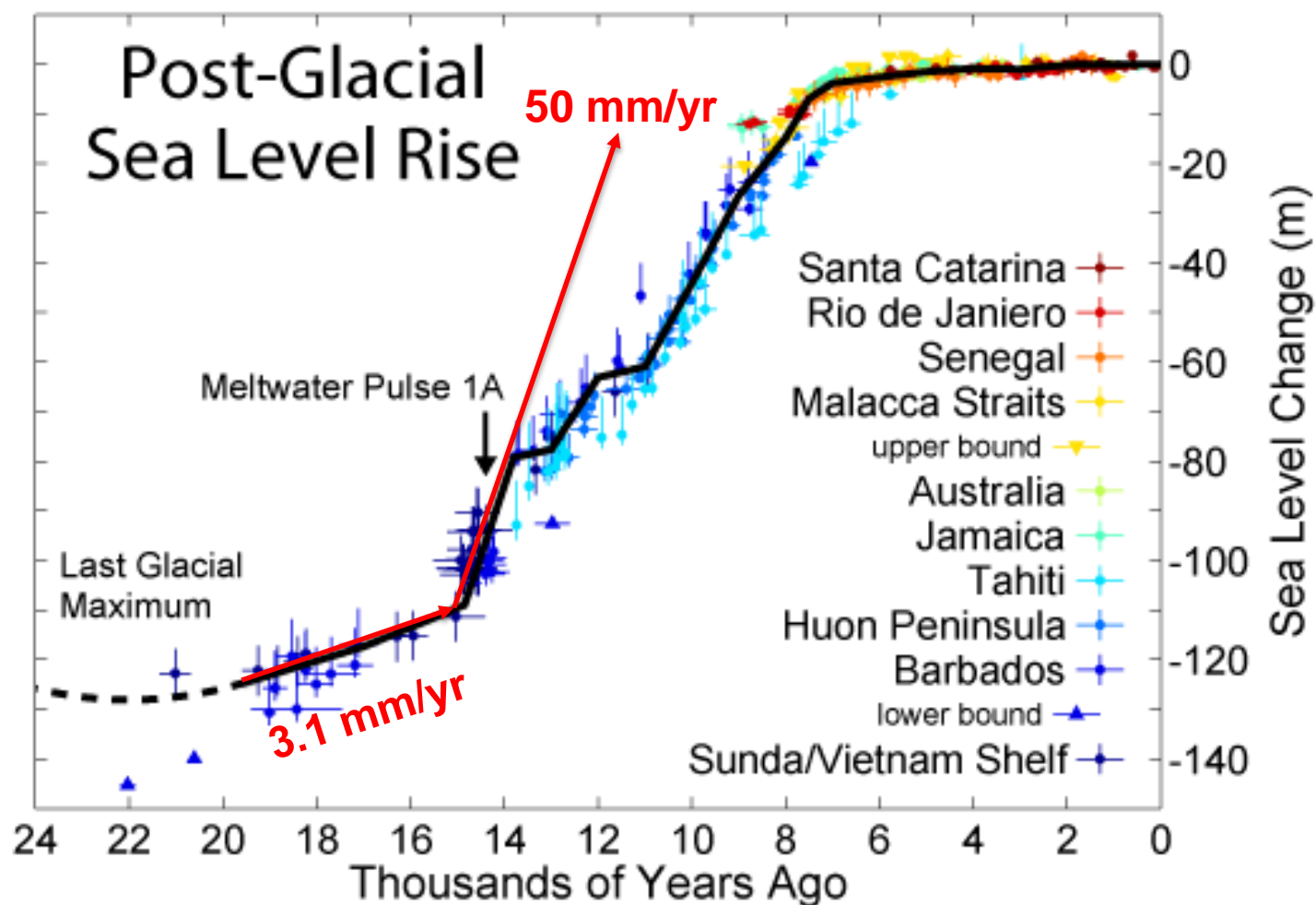
Paleoclimate Background



Paleoclimate Background



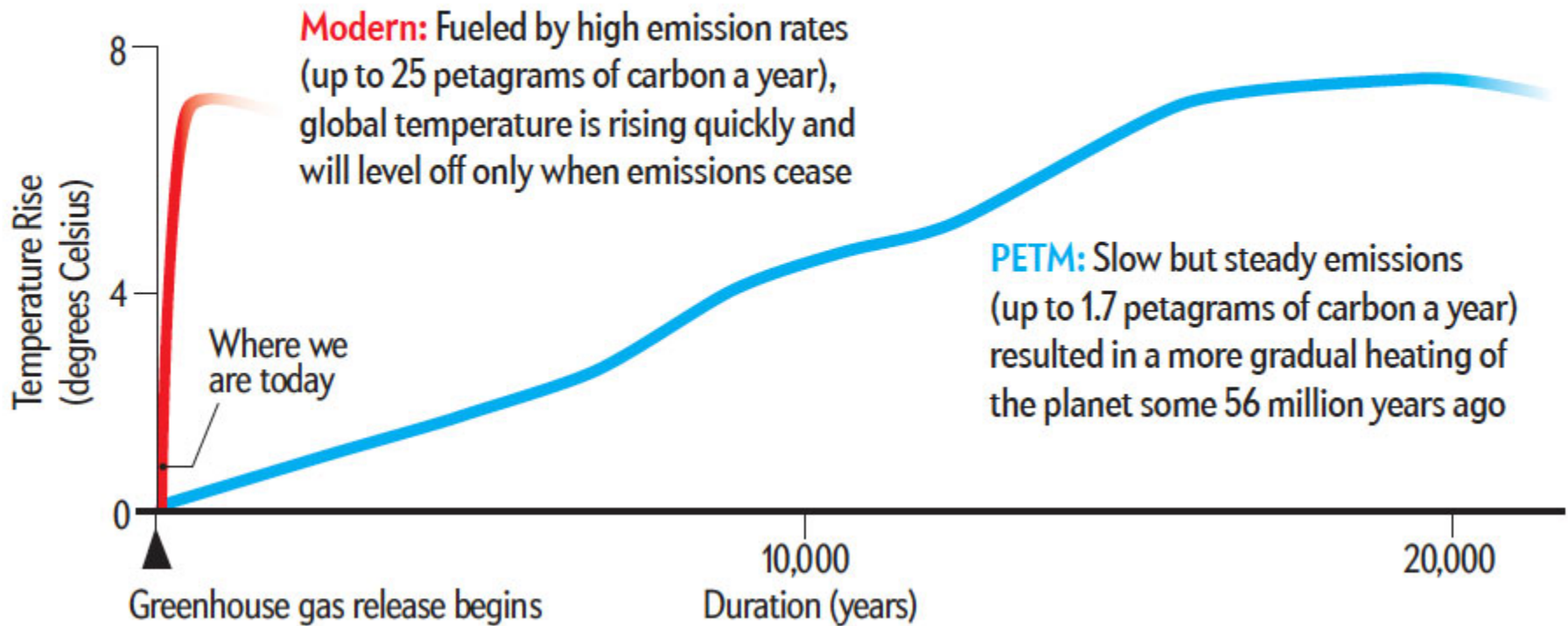
Paleoclimate Background





CO₂ Record

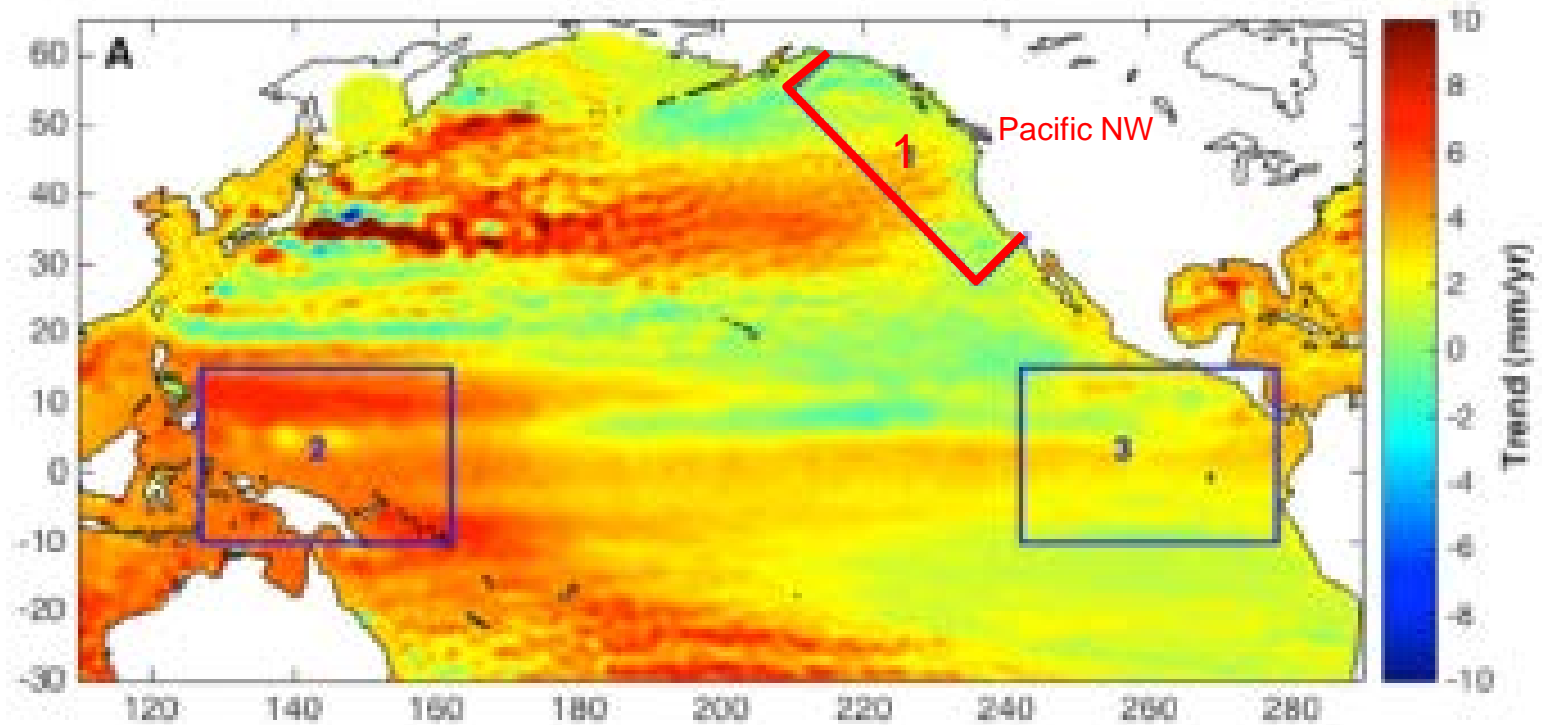
Global temperature is rising much more quickly today than it did during the PETM



The slide features a white background with two large, overlapping blue geometric shapes on the left side. One is a lighter blue triangle pointing towards the top right, and the other is a darker blue triangle pointing towards the bottom right. The text is centered in the white space.

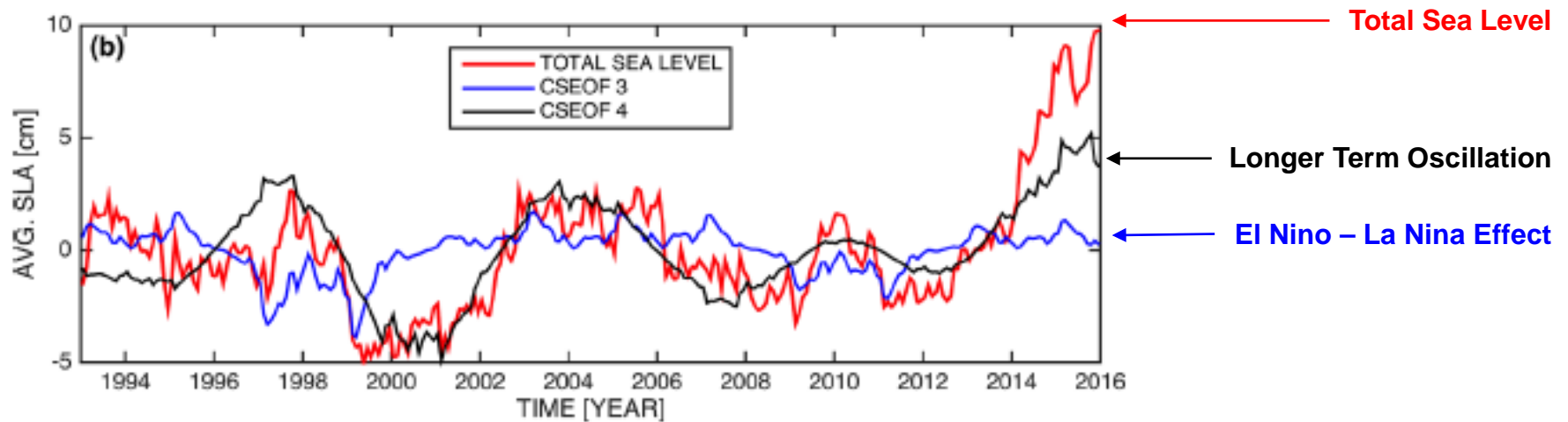
What's happening in BC
coastal waters?

Recent NE Pacific Sea Level Rise



Source: Hamlington, B.D. et al, "An ongoing shift in Pacific Ocean Sea Level, JGR, 121, 5084-5097, 2016

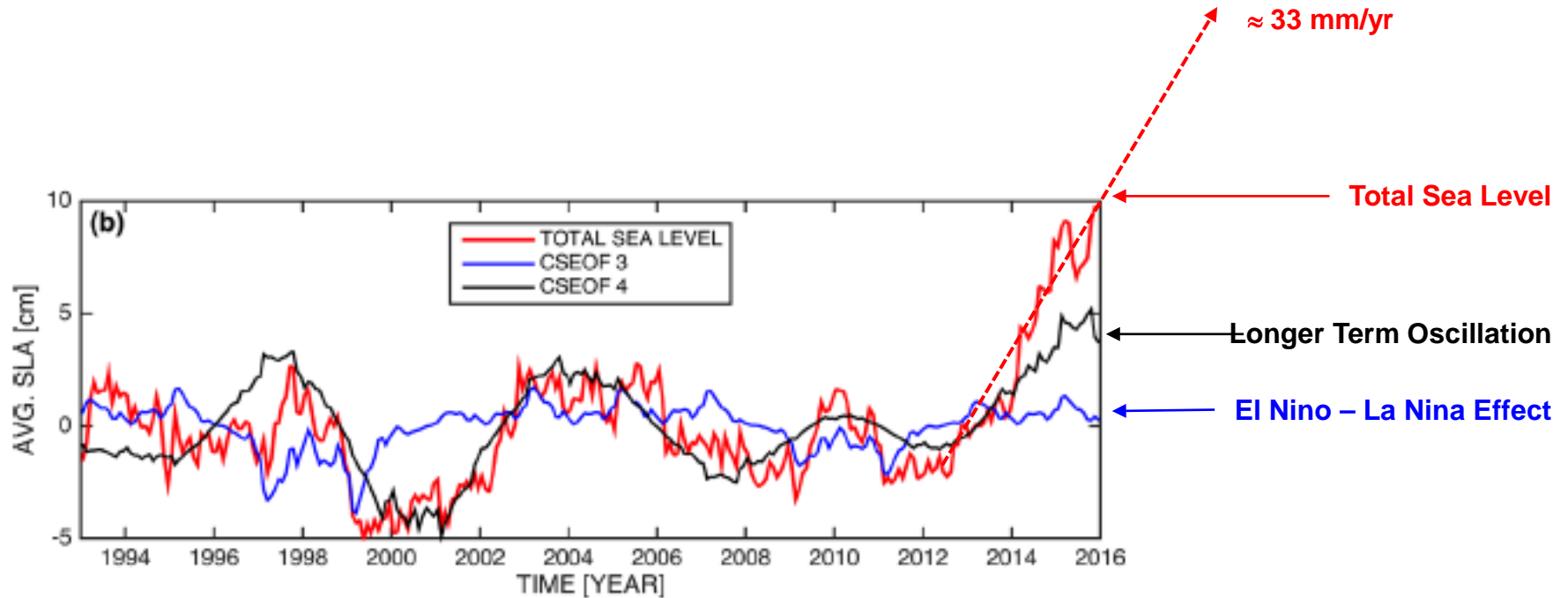
Recent Pacific NW Sea Level Rise Trends



Source: Hamlington, B.D. et al, "An ongoing shift in Pacific Ocean Sea Level, JGR, 121, 5084-5097, 2016



Recent Pacific NW Sea Level Rise Trends



Source: Hamlington, B.D. et al, "An ongoing shift in Pacific Ocean Sea Level, JGR, 121, 5084-5097, 2016



Recent Pacific NW Sea Level Rise Trends

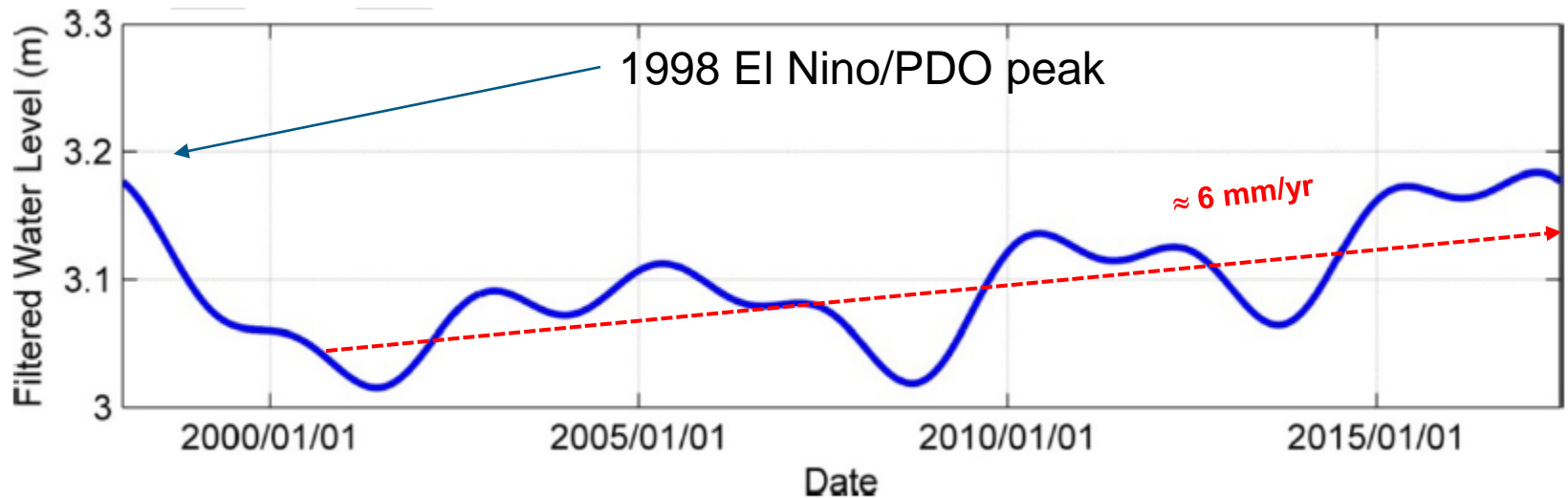


Figure 6 Filtered sea level derived from the 1998-2017 tide gauge data in Vancouver Harbour

Source: Port of Vancouver Flooding Study 2017 (Draft Report) – interpretation by SNC Lavalin

Recent Pacific NW Sea Level Rise Trends

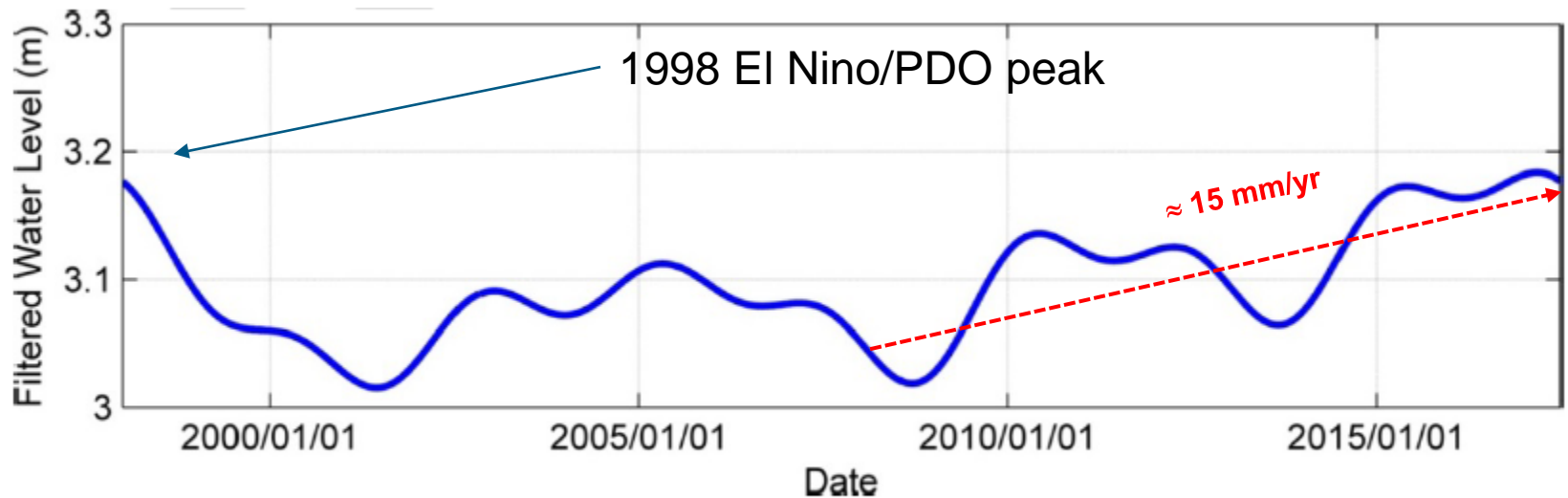
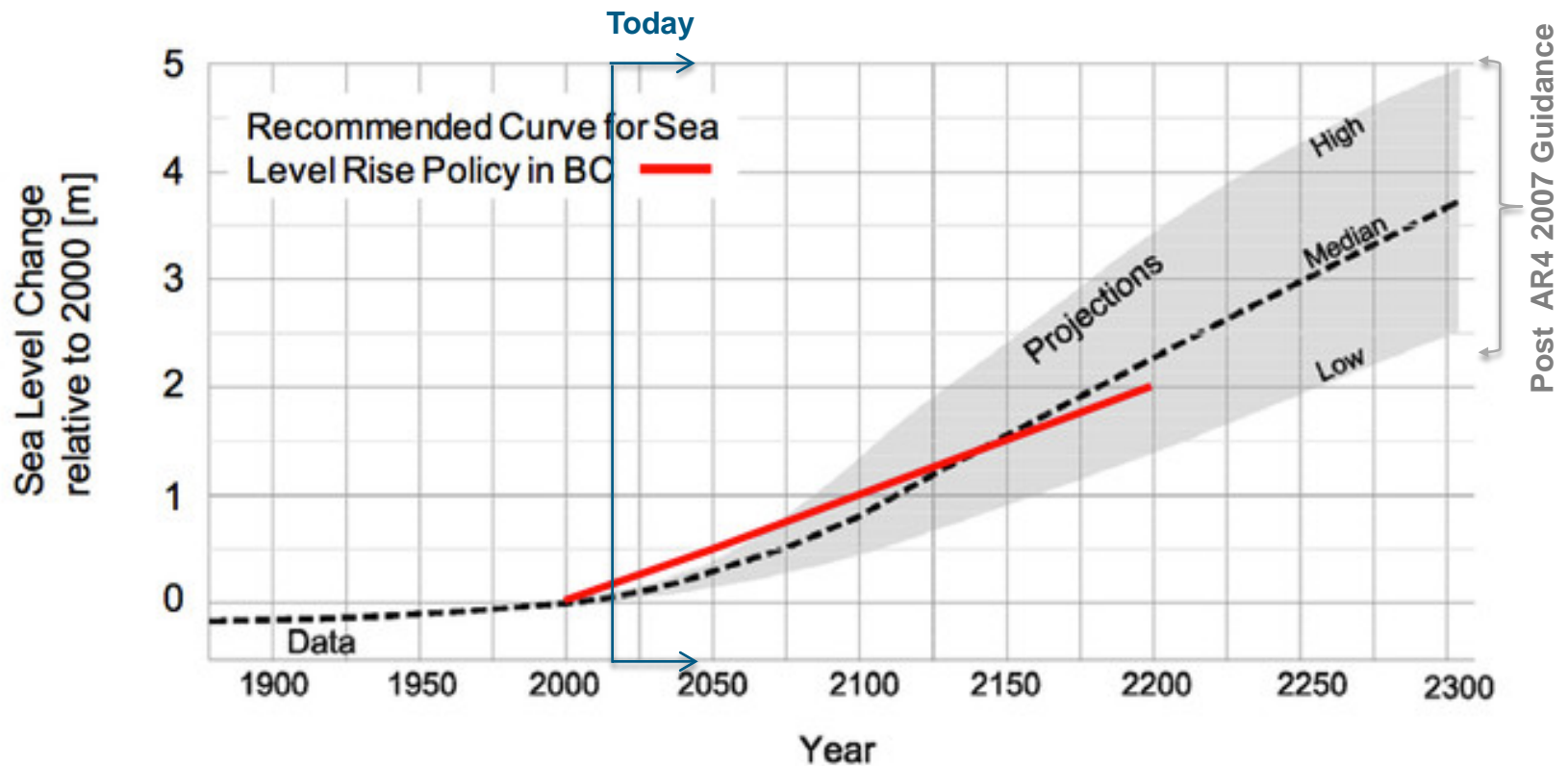


Figure 6 Filtered sea level derived from the 1998-2017 tide gauge data in Vancouver Harbour

Source: Port of Vancouver Flooding Study 2017 (Draft Report) – interpretation by SNC Lavalin

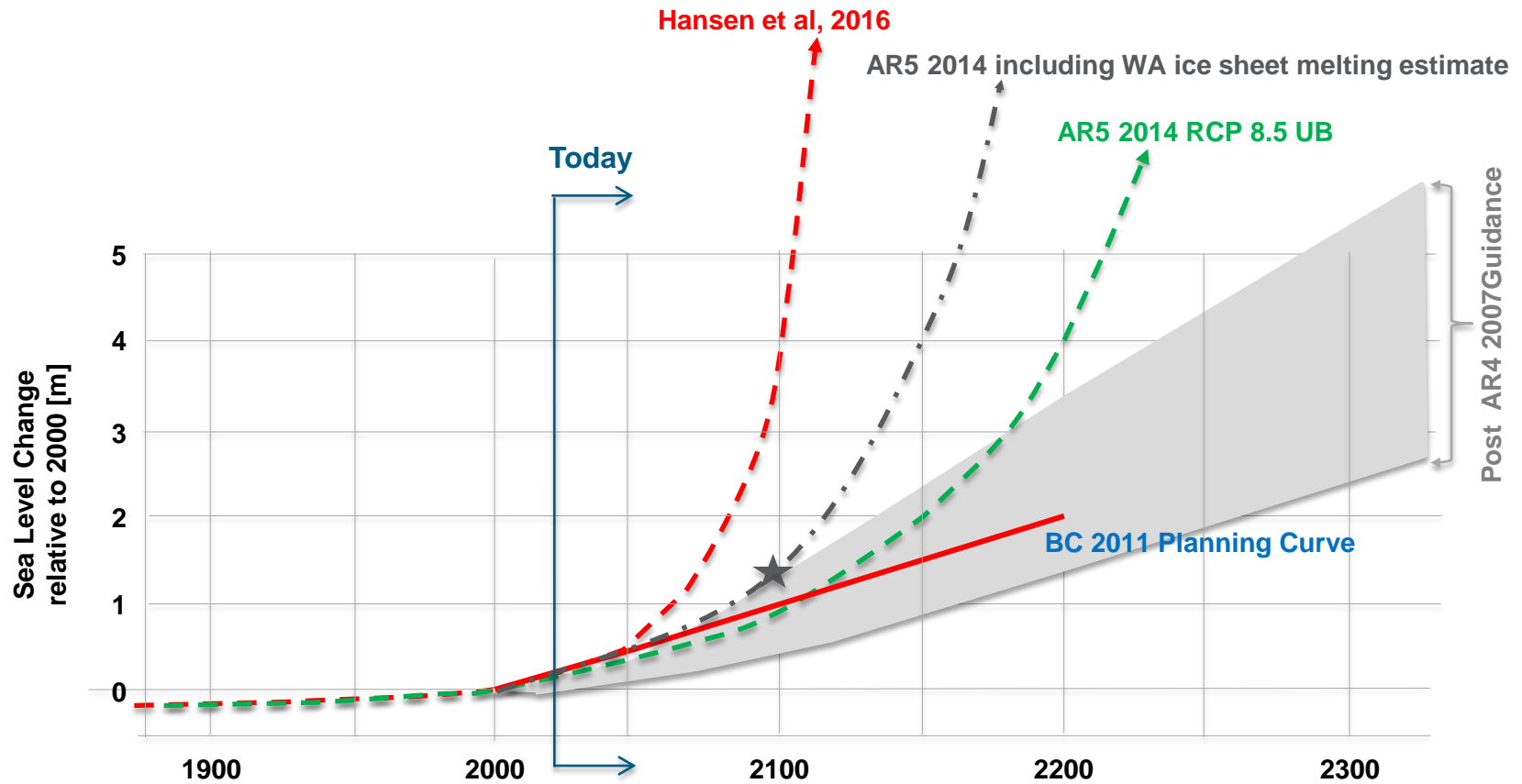


2011 BC SLR Planning Guidance





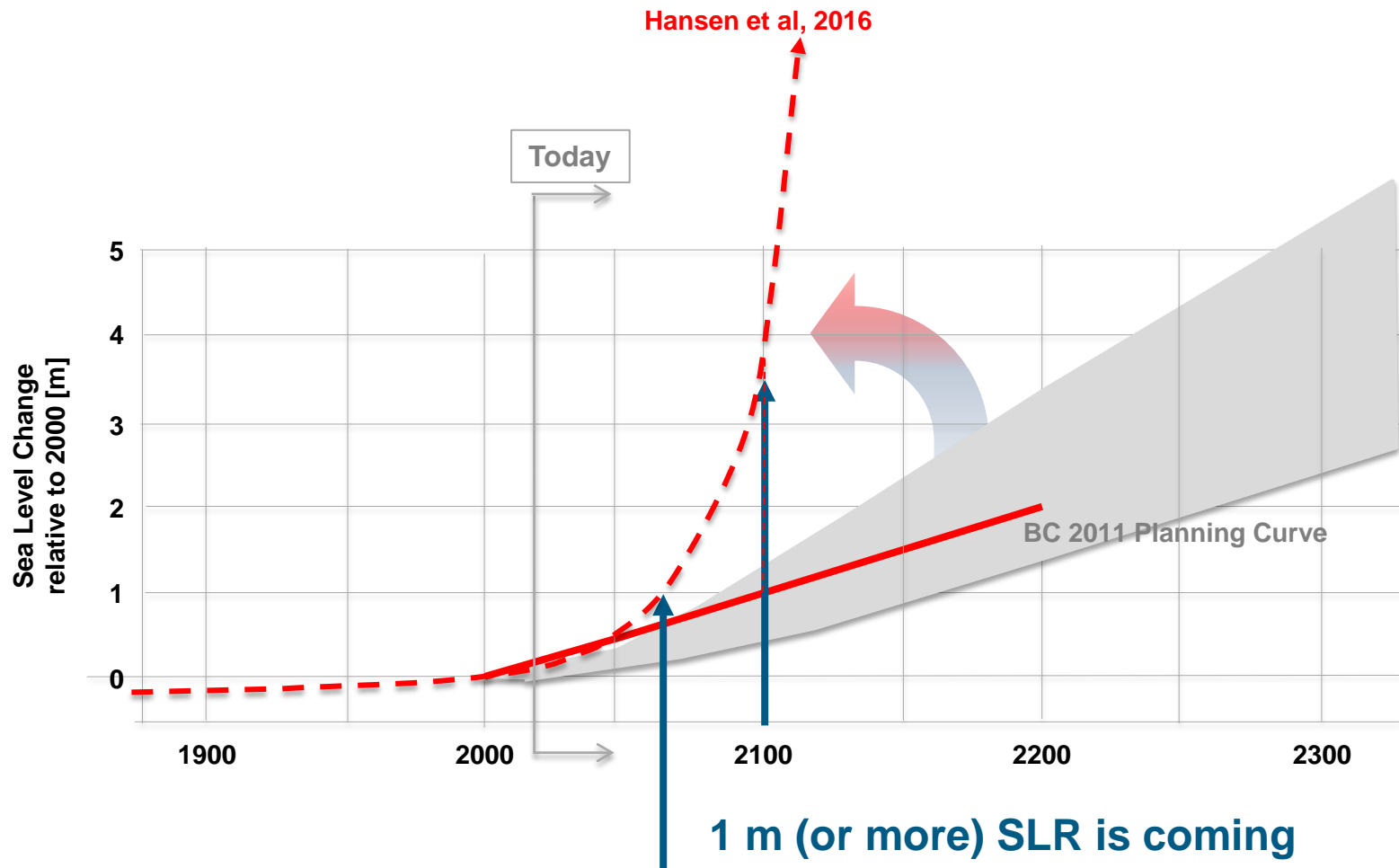
Updated Guidance Summary



★ RPC8.5+WA



Sea Level Rise Guidance 2018



What do we do?





What do we know?

- Trends in modelling and in measurements (ice mass and sea level) consistent with faster rates of sea level rise
- Available data sets are short but 5 to 10 more years will clarify the picture
- Clarification will crystallize adaptation actions
- Either SLR rate model is still good for short term (25 year) options
 - › **Typical residency times on a property**
 - › **Typical mortgages**
 - › **Re-sale value**
- Longer life infrastructure will be most affected
 - › **Major coastal infrastructure – how long do we want/expect it to last?**
 - › **Land re-development – how much more challenging will we make adaptation?**
 - › **Re-sale of property – will we realize “nest egg” planning?**

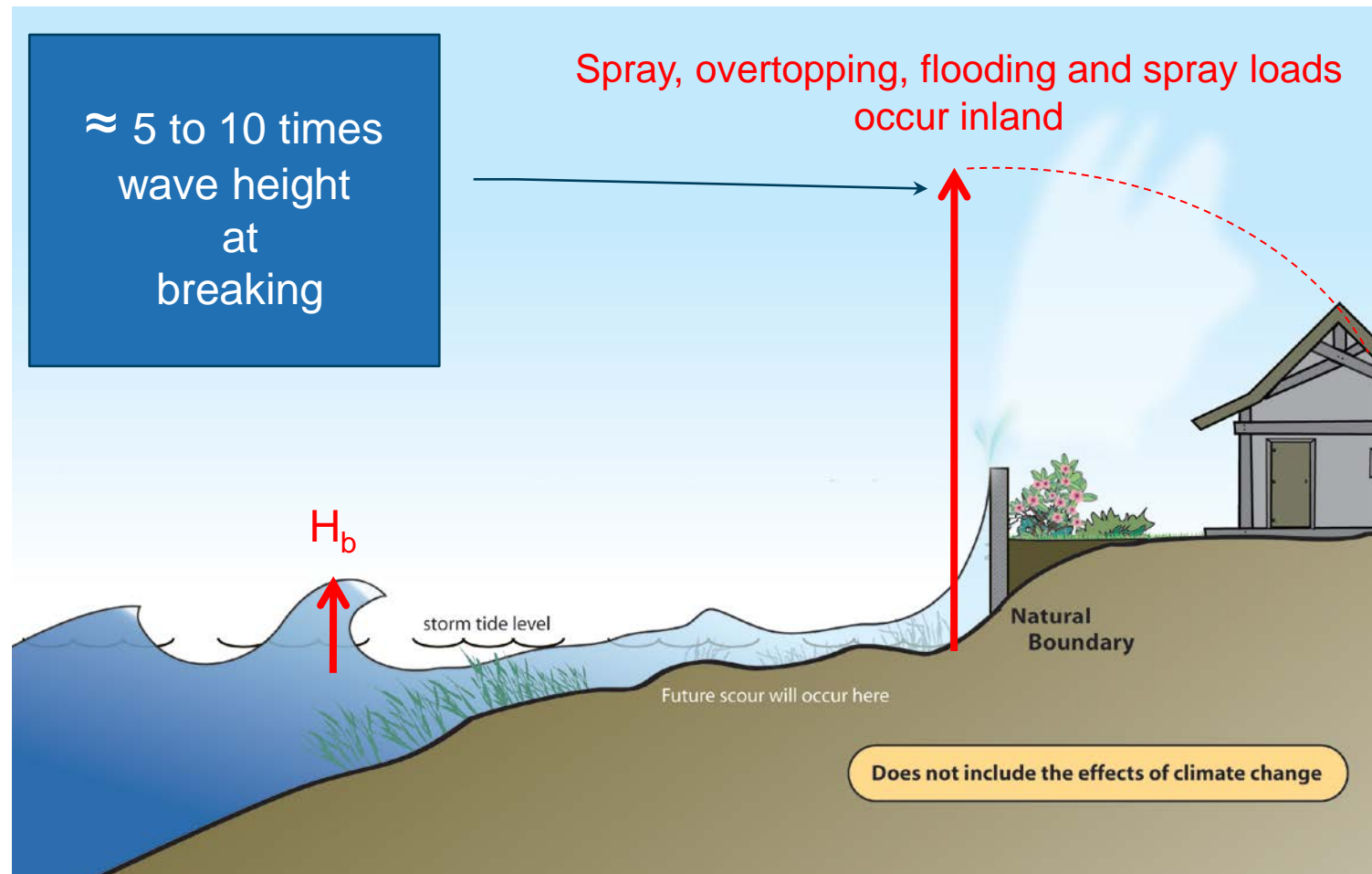




What does this mean for
BC

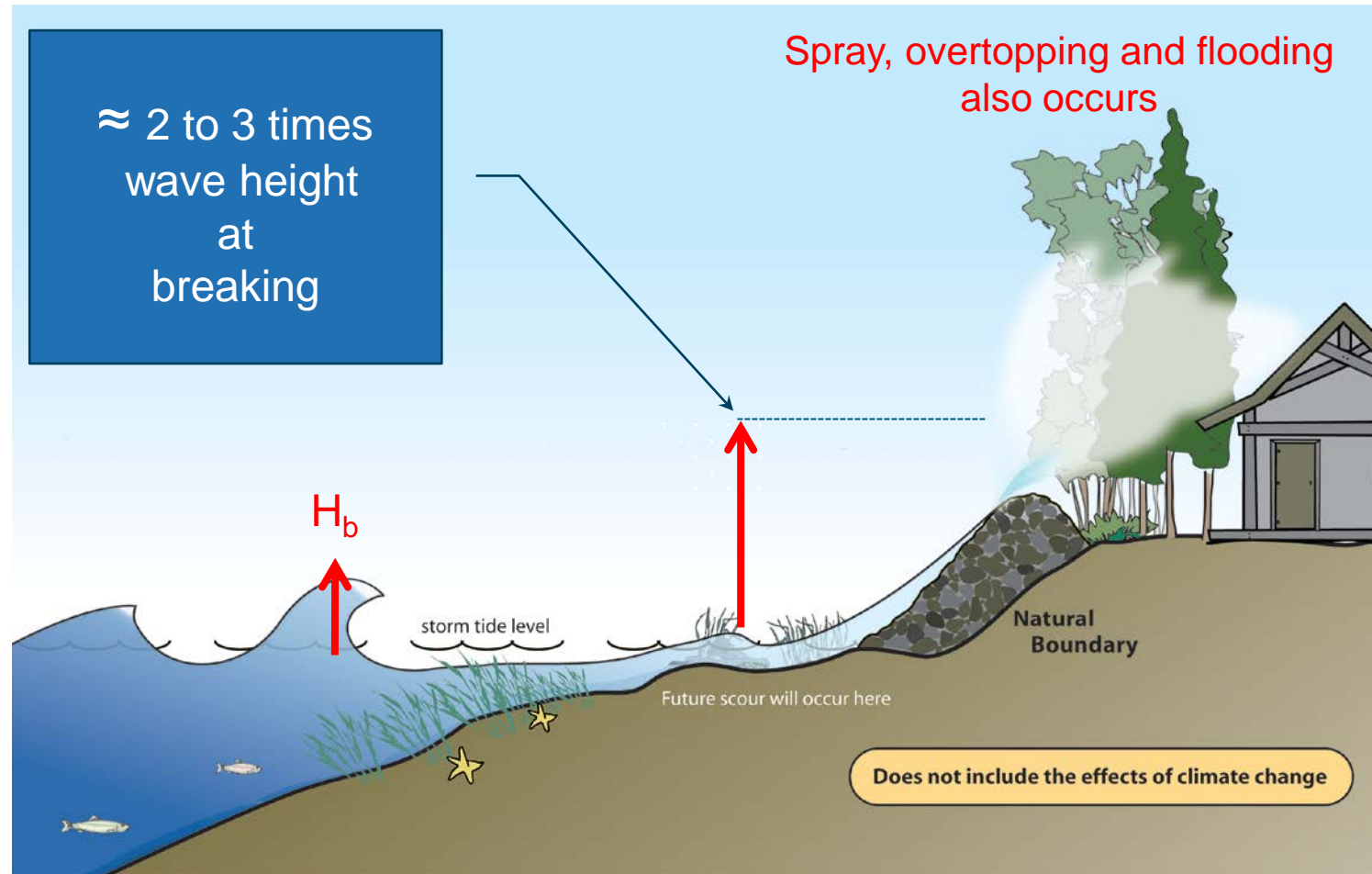
Wave Effect and Structures

Vertical Walls



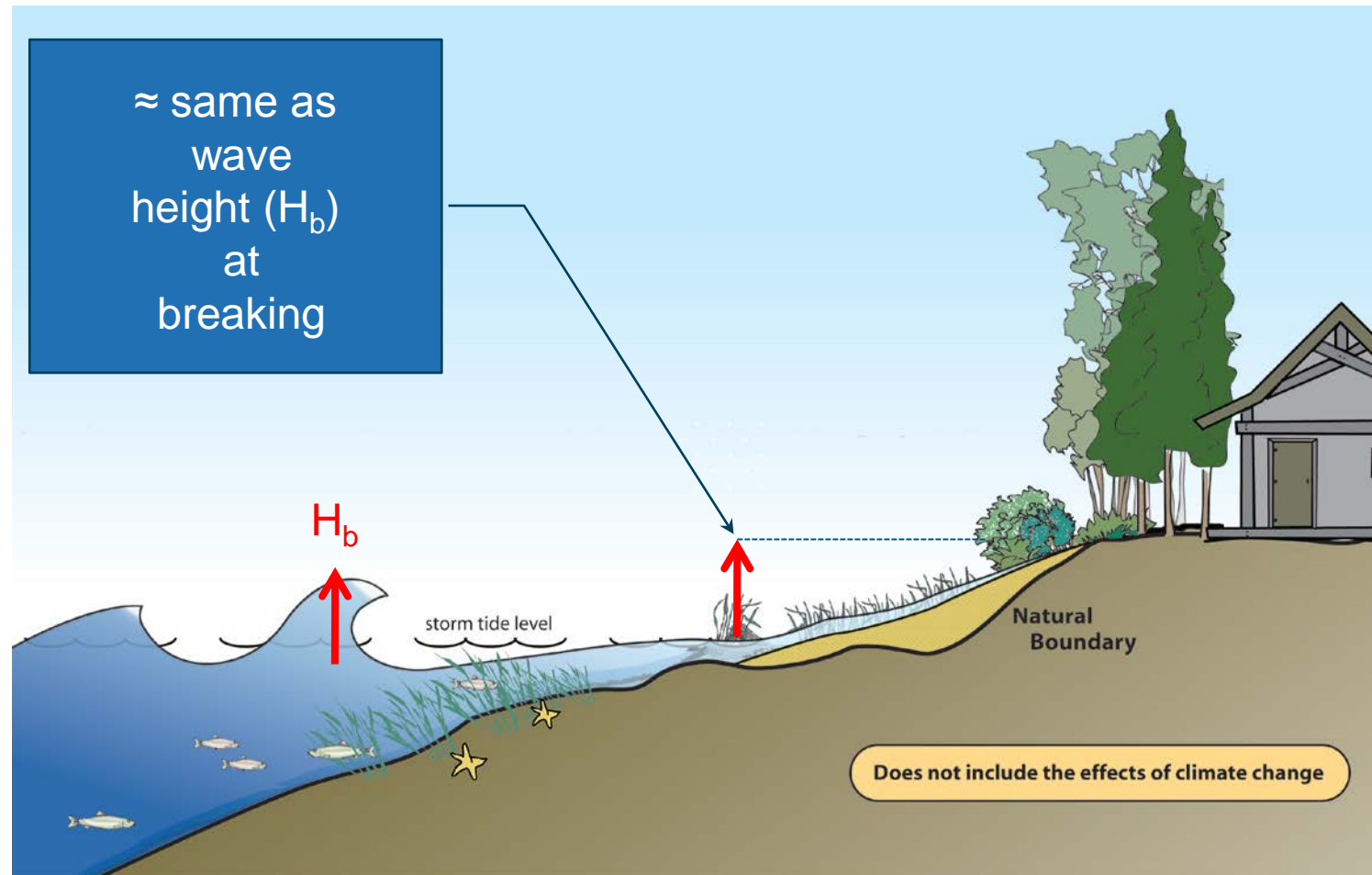
Wave Effect and Structures

Steep Slopes - Revetments



Wave Effect and Structures

Gentle Slopes - Beaches





Implications – Civic Infrastructure



Ports and Terminals:

- flooding of facilities
- security of stored goods
- safety of staff and passengers
- life of capital investments
- frequency of maintenance repairs
- environmental implications
- disposal of materials

Municipal Infrastructure:

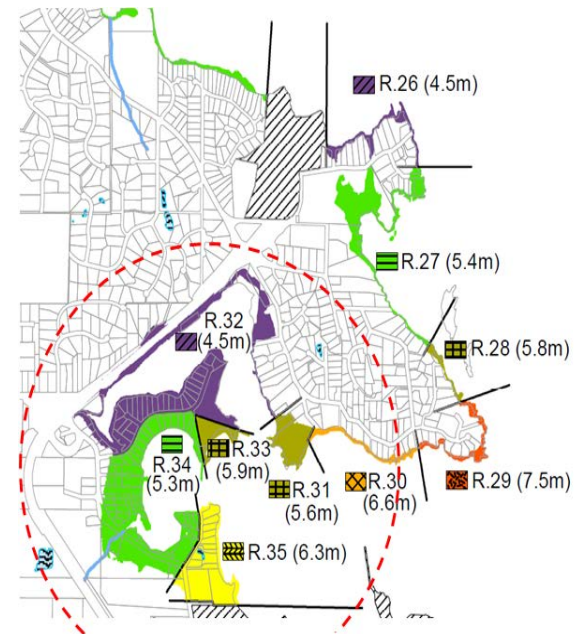
- safety of shoreline infrastructure
 - Cars
 - Pedestrians
- Reliability of service (treatment, hydro substations)
- safety of dikes
- life of capital investments
- frequency of maintenance repairs

Implications - Individuals



Waterfront Property:

- damage to shoreline edge
- damage to landscaping
- damage to building/house
- value of property
- frequency of maintenance repairs



Where to Live:

- exposure to flooding from other properties
- long term value of investment
- ability to get insurance
- ability to get mortgage
- implications to “nest egg”



Implications - Environment

Coastal Edge

- saline effects on vegetation
- Implications to birds
- Implications to marine habitat
- coastal squeeze
- loss of natural carbon sequestration (Blue Carbon)

Shoreline Interaction:

- Natural tendency to Protect
 - increased water reflection
 - increased shoreline erosion
 - increased turbidity
 - adverse implications to shallow subtidal and intertidal habitat
 - expensive
- Managed Retreat
 - Increased shoreline erosion – loss of waterfront property value



What do we do?



Next Steps

Think carefully

Plan Wisely

Be Proactive

Hire a Coastal Engineer

Thank You

Values that guide us

Our values keep us anchored and on track. They speak to how we run our business, how we express ourselves as a group, and how we engage with our stakeholders and inspire their trust.

Teamwork & excellence

We're innovative, collaborative, competent and visionary.

Customer focus

Our business exists to serve and add long-term value to our customers' organizations.

Strong investor return

We seek to reward our investors' trust by delivering competitive returns.

Health & safety, security and environment

We have a responsibility to protect everyone who comes into contact with our organization.

Ethics & compliance

We're committed to making ethical decisions.

Respect

We consistently demonstrate respect for all our stakeholders.

