



Photo from personal collection

Economic evaluation of adaptation pathways: A case study in Los Angeles County

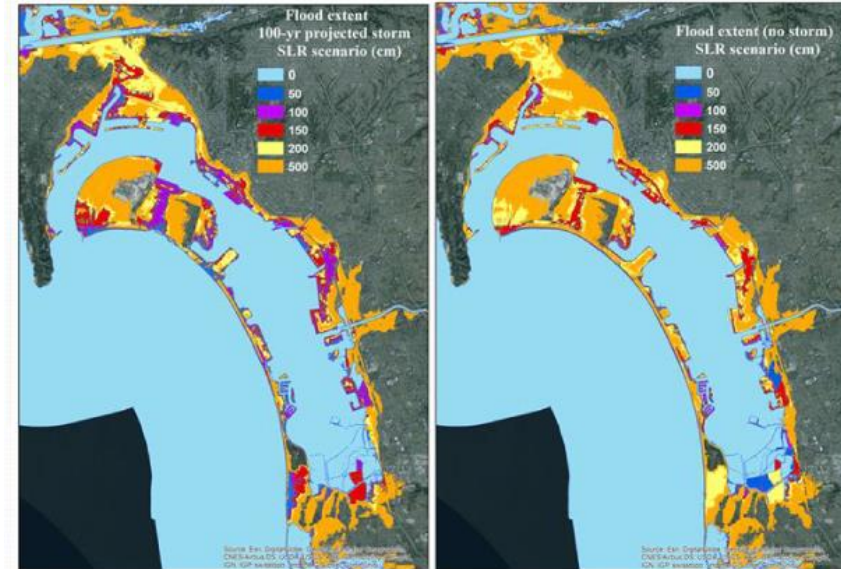
Lars de Ruig, Patrick Barnard, Wouter Botzen, Phyllis Grifman, Juliette Hart, Hans de Moel, Nick Sadrpour & Jeroen Aerts

Sea Level Rise Vulnerability Study for the City of Los Angeles

Prepared by the
University of Southern California Sea Grant Program

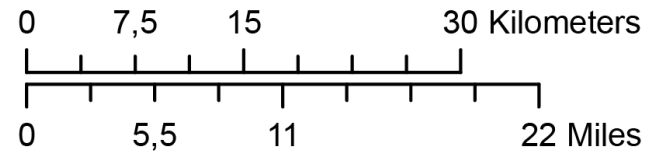
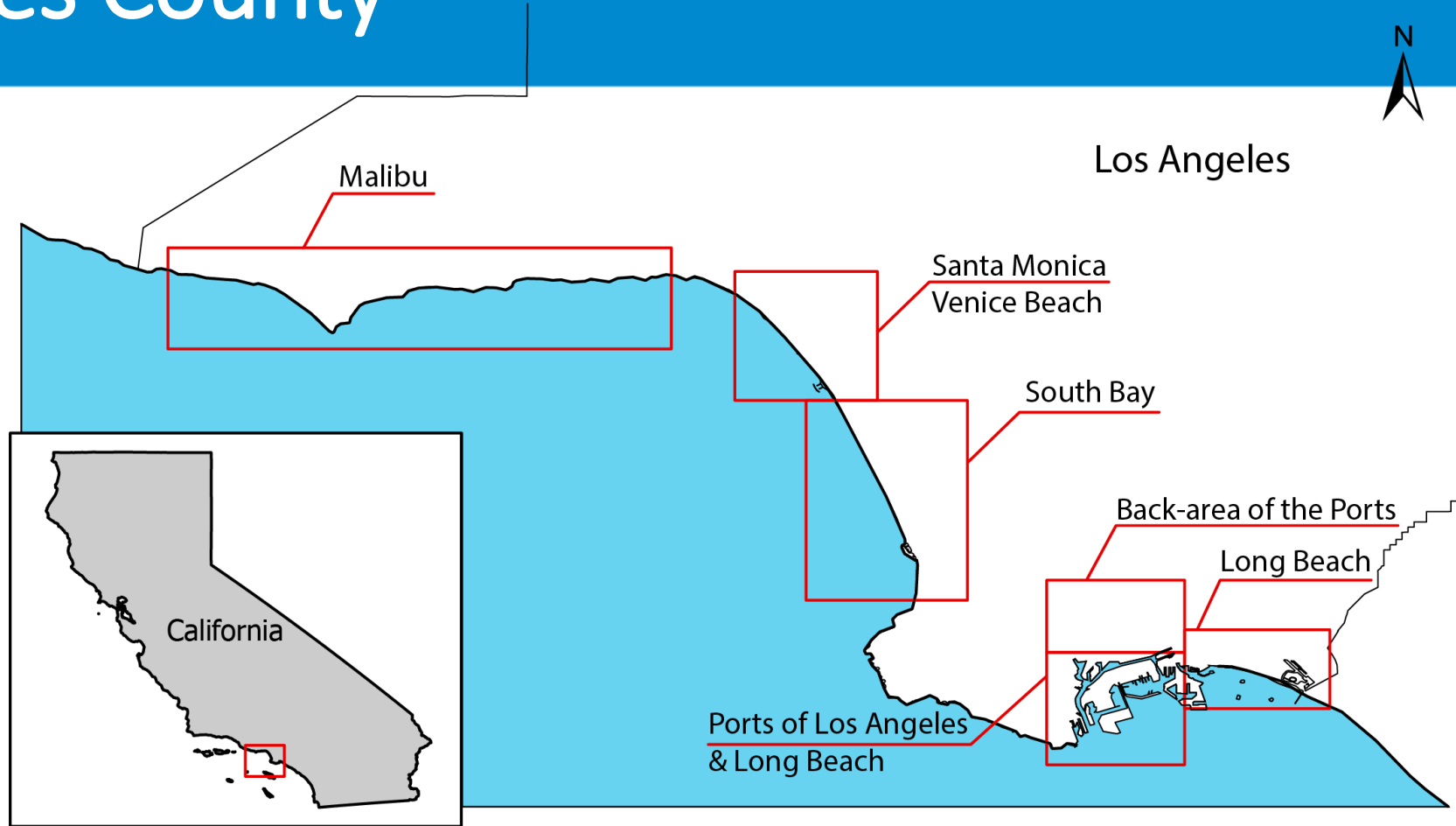


Coastal Storm Modeling System (CoSMoS)



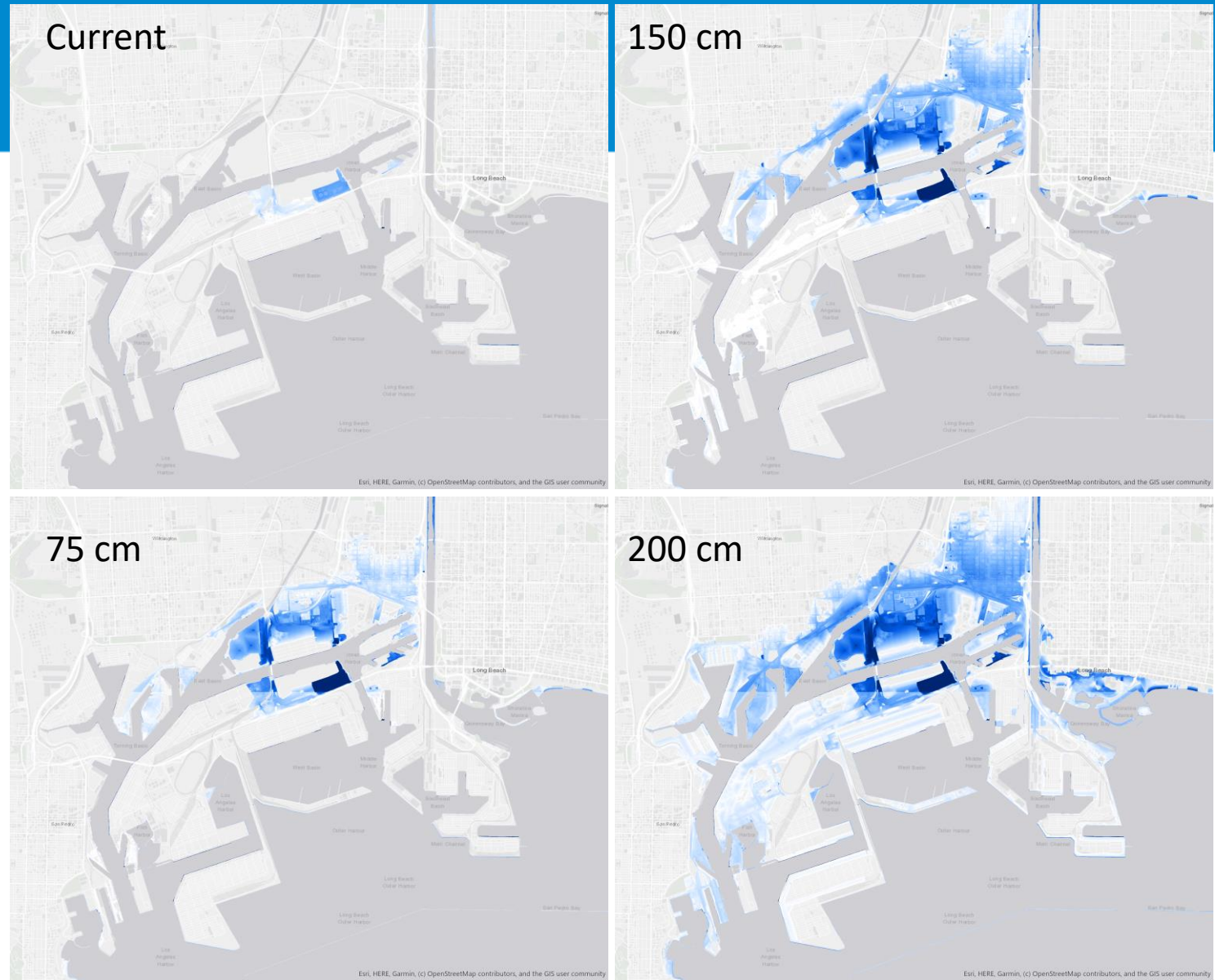
CoSMoS v3.0 Phase 2 Southern California
Bight:
Summary of methods

Los Angeles County



Inundation

Coastal Storm modeling system
(CoSMoS) – USGS
100-year storm
(Barnard et al., 2014)



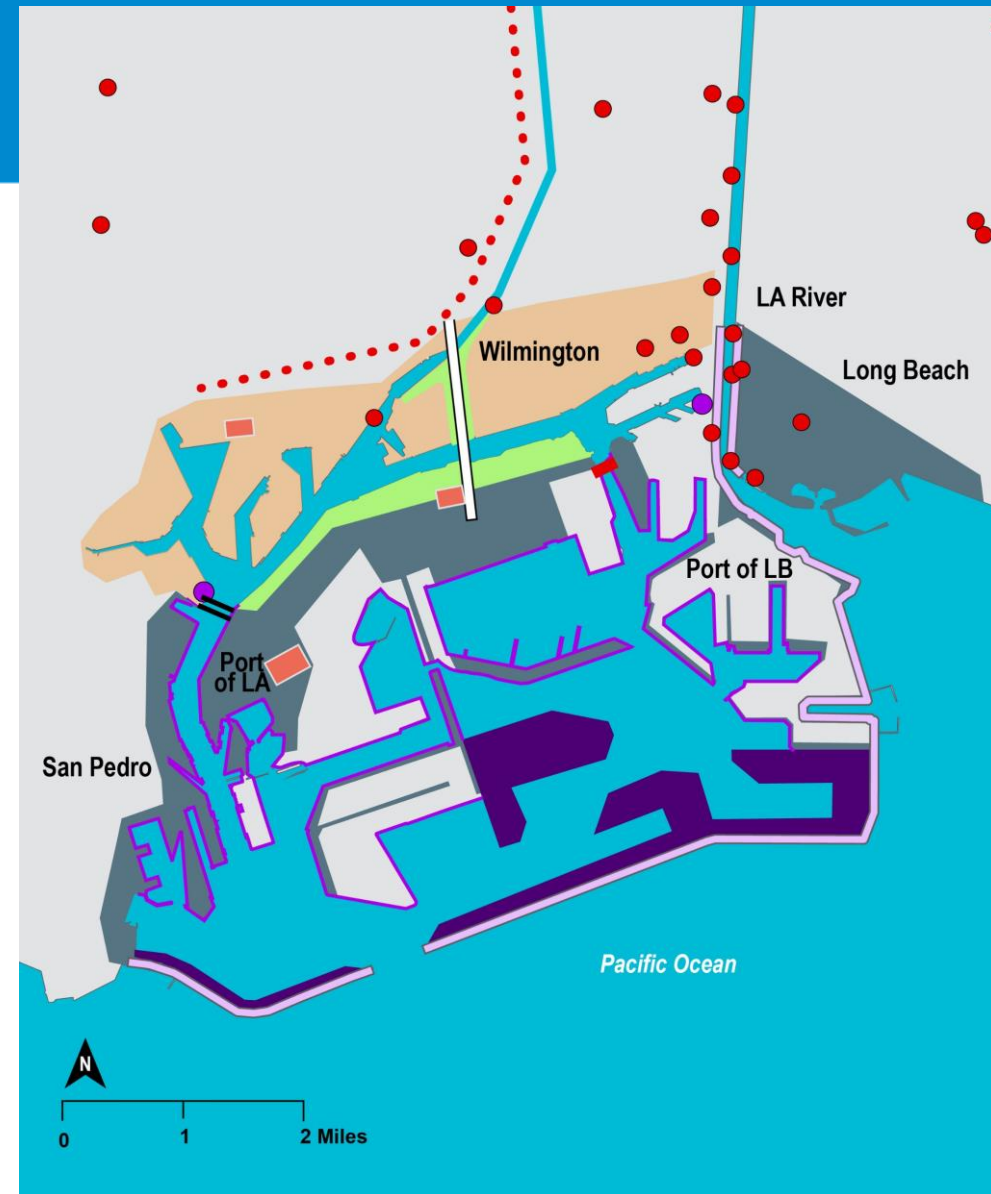
Adaptation strategy design (Aerts et al., 2018)

- Dynamic Coast
 - Beach nourishment
 - Elevation of buildings
 - Dry-/wet-floodproofing
 - Bulkheads

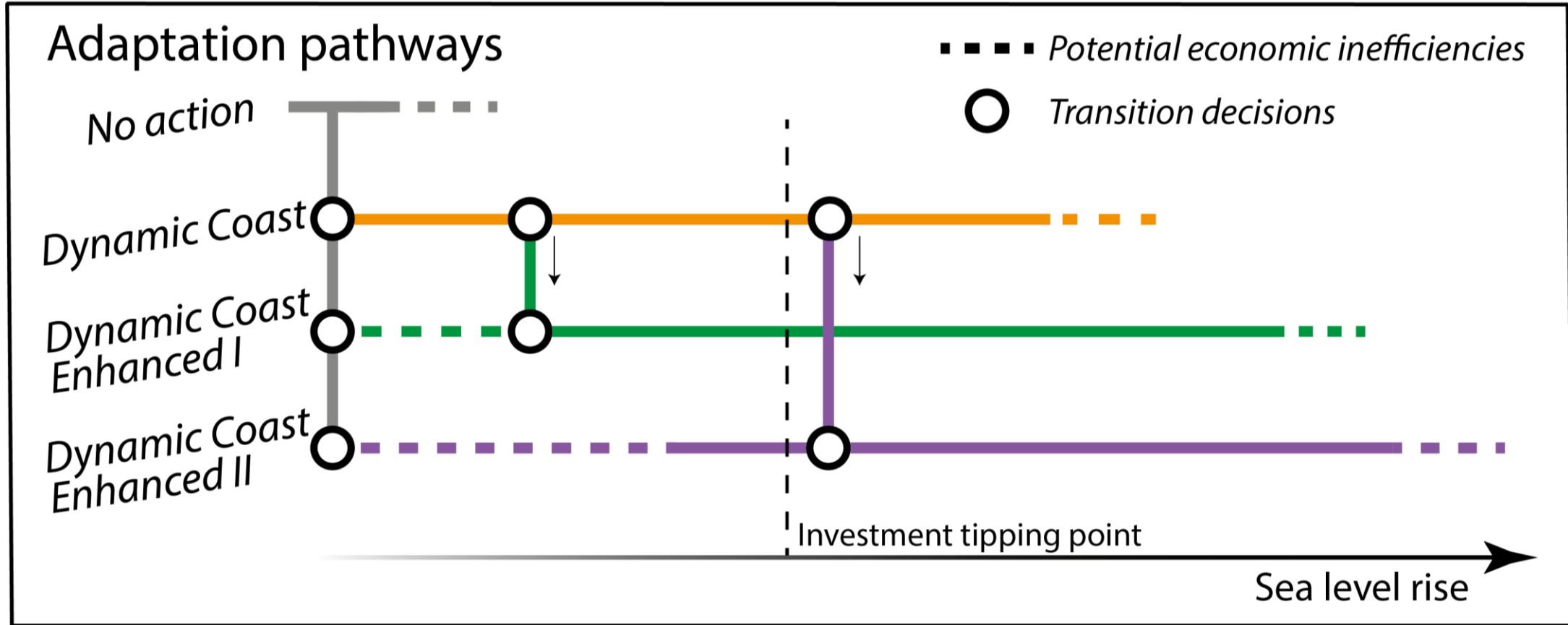


Community-scale adaptation

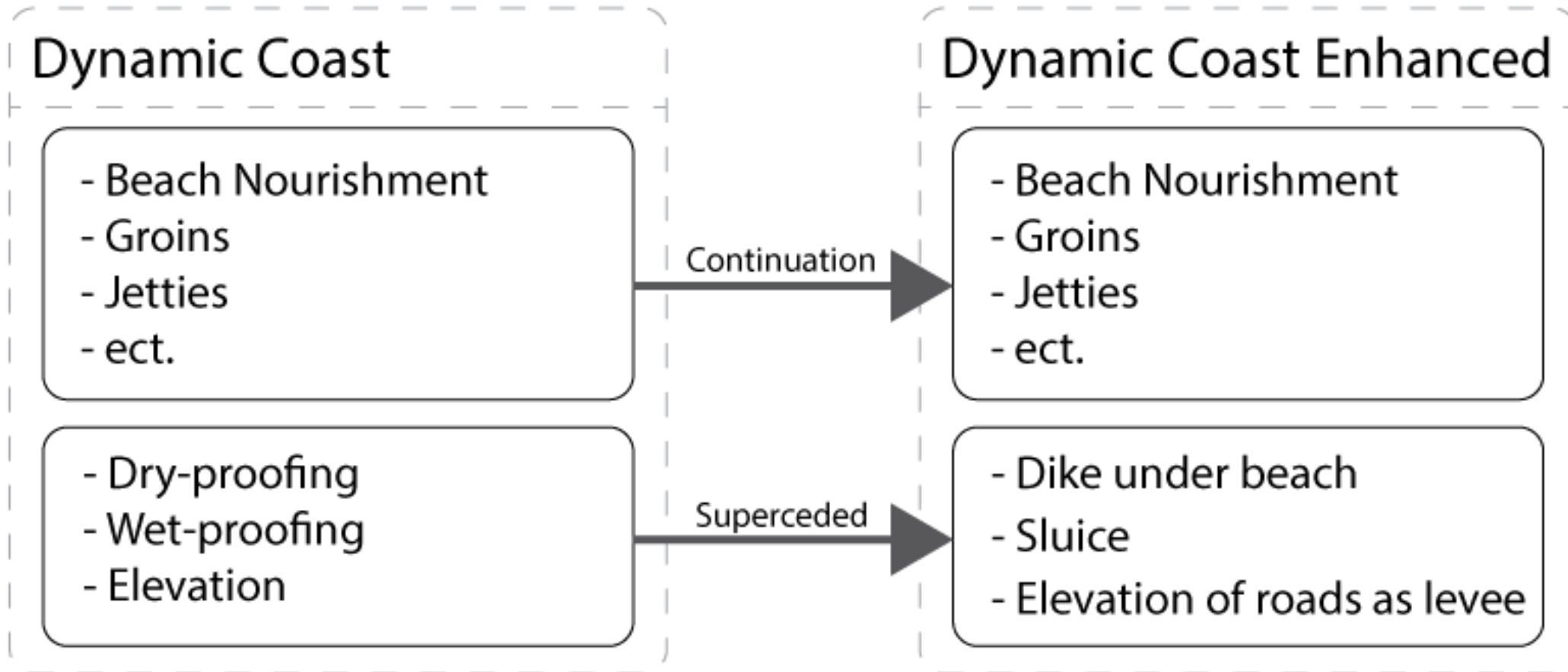
- Dynamic Coast Enhanced
 - Sluices
 - Dikes underneath beaches
 - Elevate roads as levees



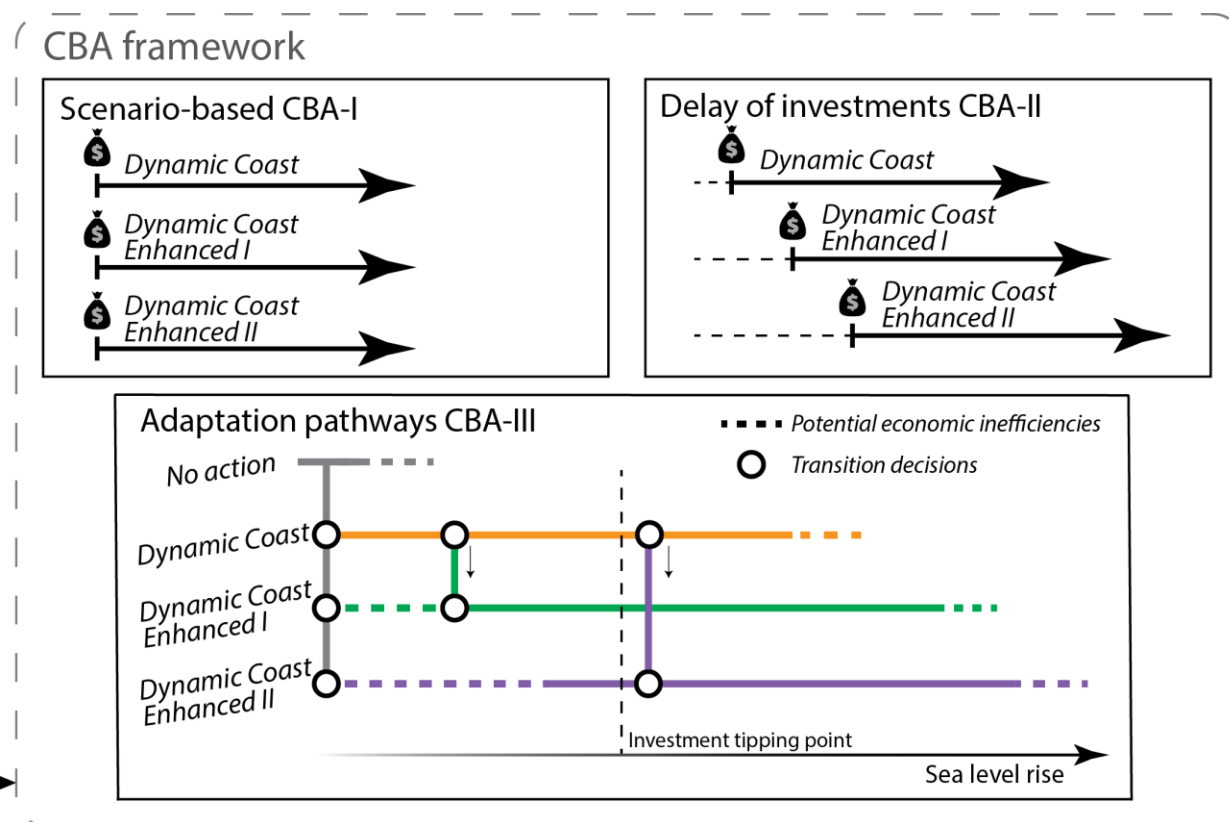
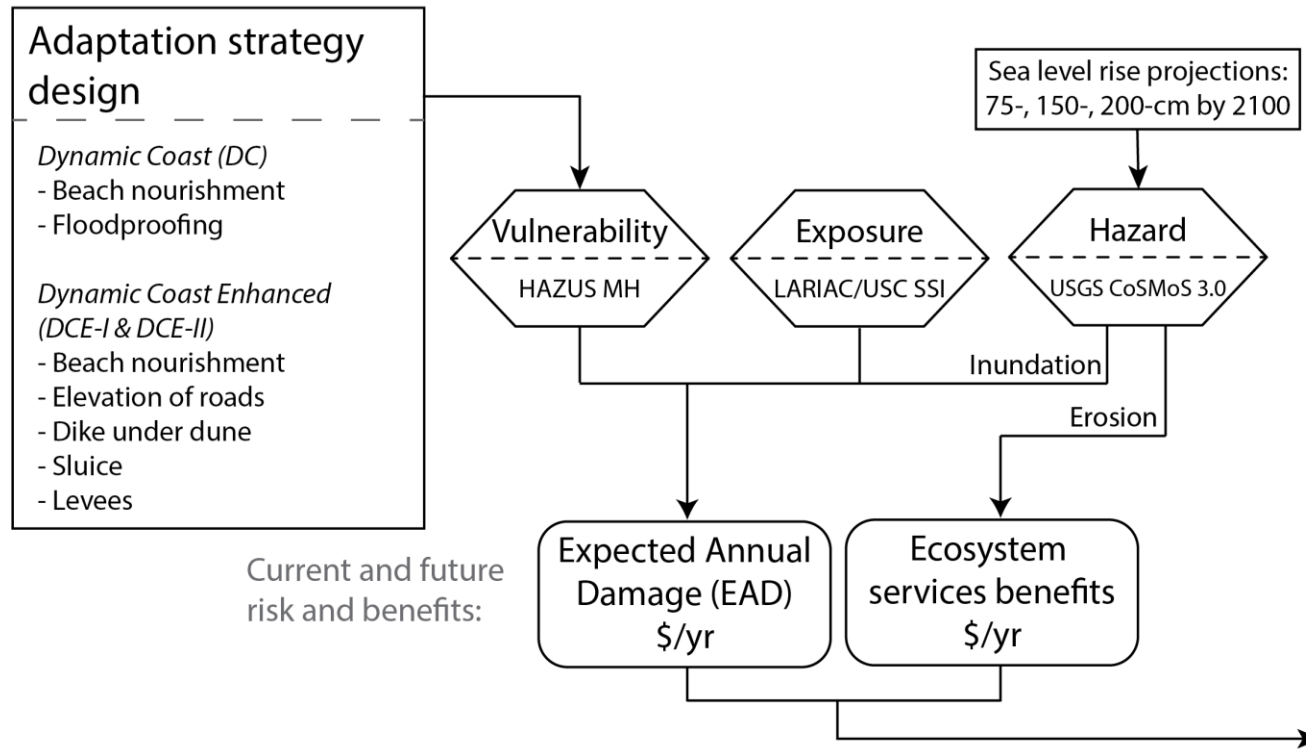
Adaptation pathways



Adaptation pathways



Economic evaluation of adaptation pathways



Static CBA (implement in 2020)

Port of LA/LB	Expected annual damage	Dynamic Coast	Dynamic Coast Enhanced-I
SLR	<i>mln\$/year</i>	<i>BCR</i>	<i>BCR</i>
Current	27.2		
75 cm	56.2	2.5	0.14
150 cm	134.9	3.53	0.23
200 cm	209.4	4.99	0.35

(de Ruig et al. 2019)

Discount rate of 4%

Static CBA (implement in 2020)

Port of LA/LB	Expected annual damage	Dynamic Coast	Dynamic Coast Enhanced-I
SLR	<i>mln\$/year</i>	<i>BCR</i>	<i>BCR</i>
Current	27.2		
75 cm	56.2	2.5	0.14
150 cm	134.9	3.53	0.23
200 cm	209.4	4.99	0.35

(de Ruig et al. 2019)

Discount rate of 4%

Static CBA (implement in 2020)

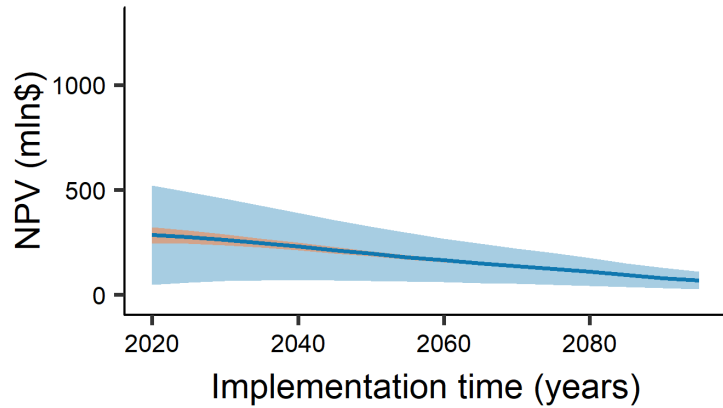
Port of LA/LB	Expected annual damage	Dynamic Coast	Dynamic Coast Enhanced-I
SLR	<i>mln\$/year</i>	<i>BCR</i>	<i>BCR</i>
Current	27.2		
75 cm	56.2	2.5	0.14
150 cm	134.9	3.53	0.23
200 cm	209.4	4.99	0.35

(de Ruig et al. 2019)

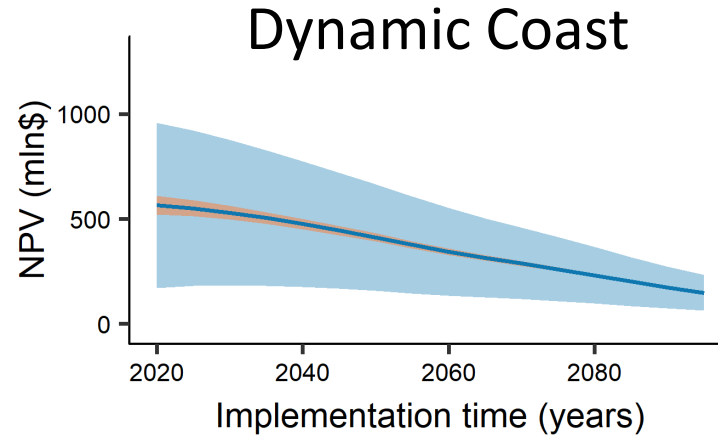
Discount rate of 4%

Delayed investment CBA – Ports of LA & LB

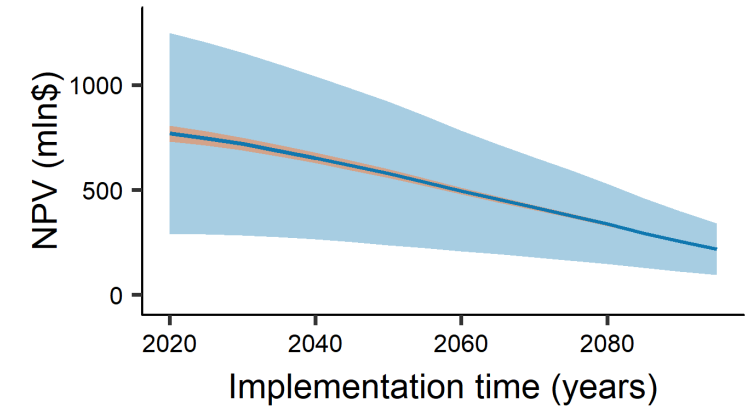
75 cm SLR



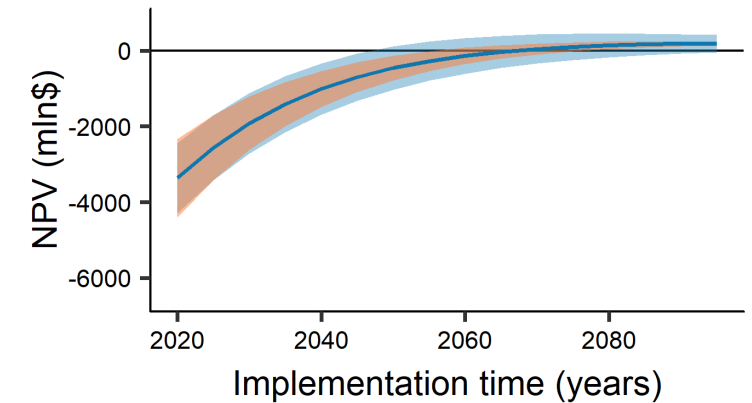
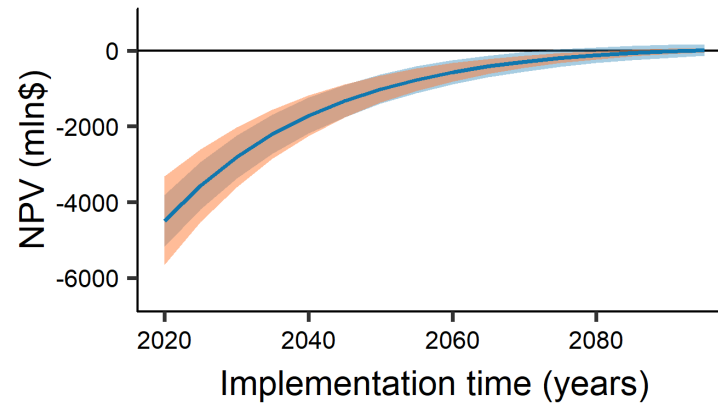
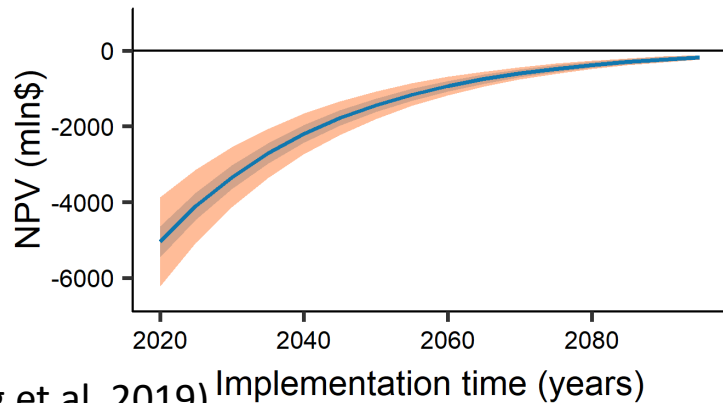
150 cm SLR



200 cm SLR



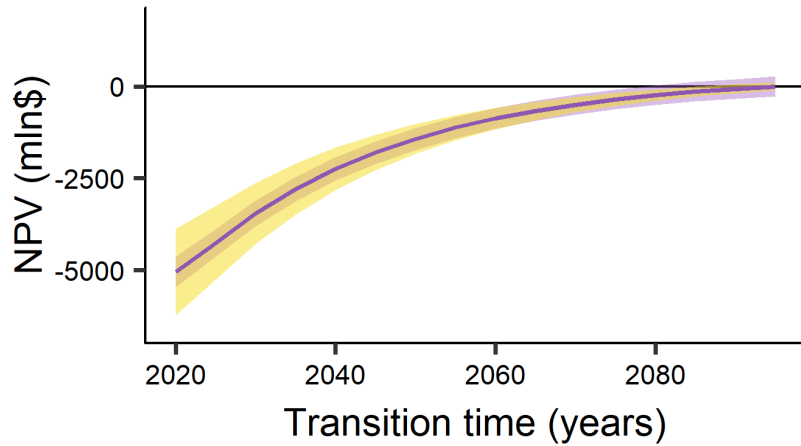
Dynamic Coast Enhanced I



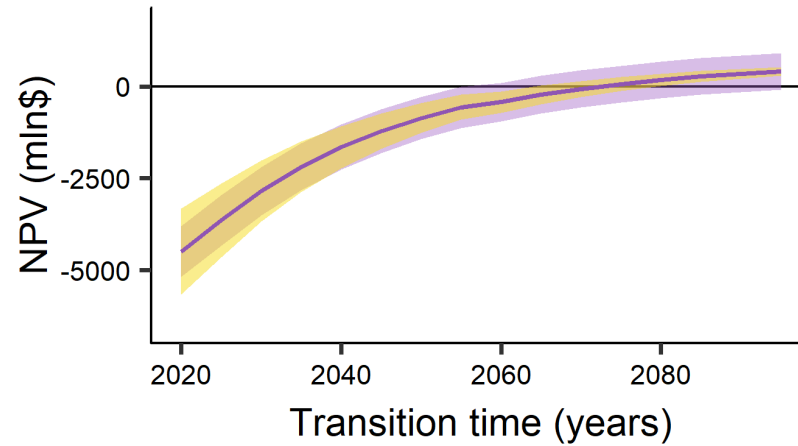
(de Ruig et al. 2019)

Adaptation pathways CBA (DC to DCE-I)

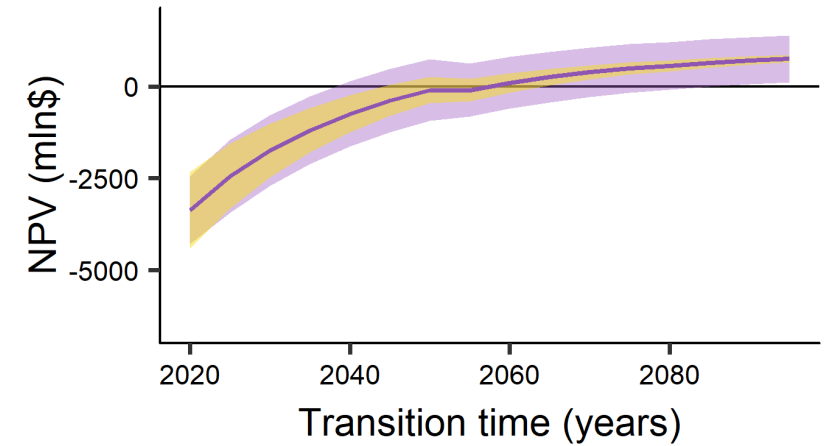
75 cm SLR



150 cm SLR



200 cm SLR



(de Ruig et al. 2019)

Adaptation pathways take-aways

- Flexibility
- Spreads costs over time
- Learning of climate change over time



Photo from personal collection

Economic evaluation of adaptation pathways: A case study in Los Angeles County

Lars de Ruig, Patrick Barnard, Wouter Botzen, Phyllis Grifman, Juliette Hart, Hans de Moel, Nick Sadrpour & Jeroen Aerts