

Research Area 4

Climate Change and Sea-Level Rise

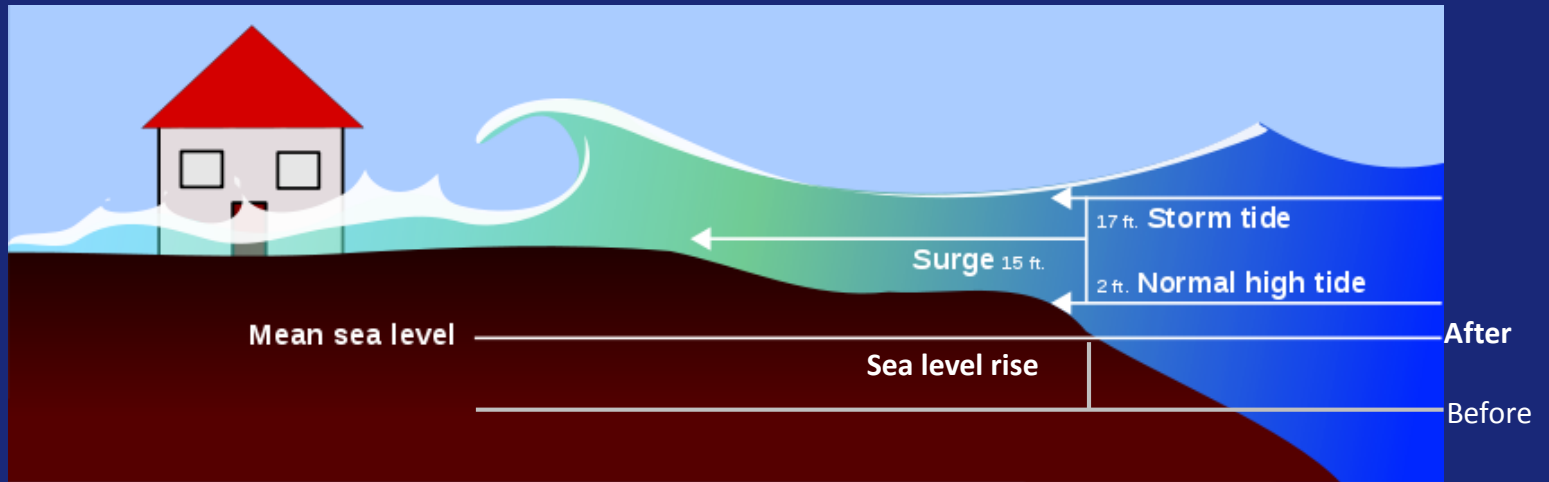
4.1 Improved Evacuation Zone (EZ) Modeling

➤ Sea-level

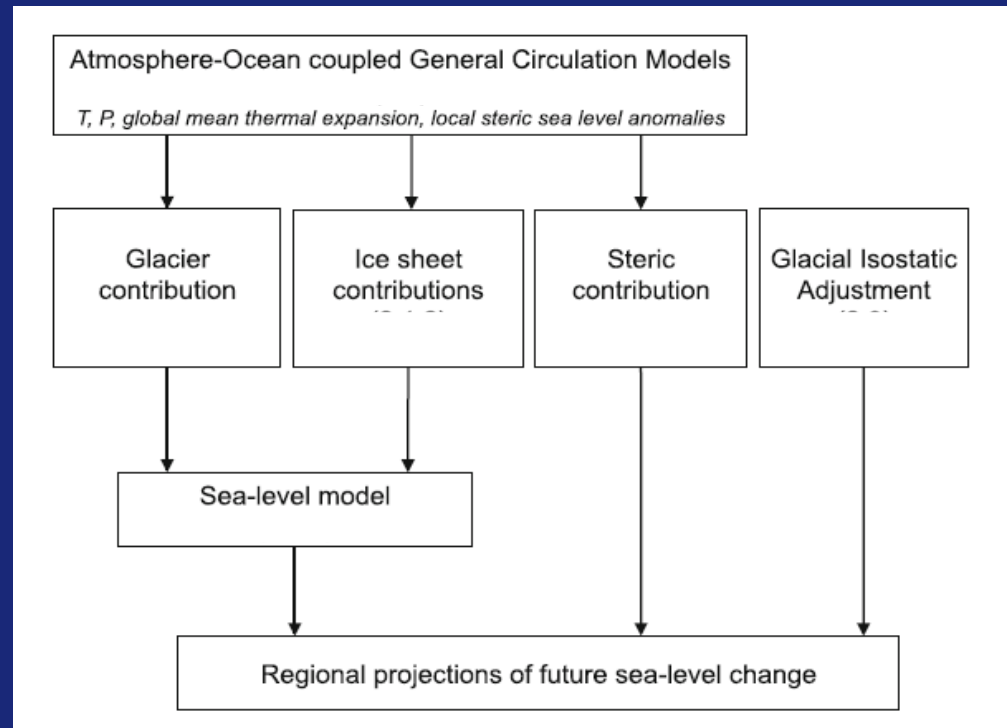
Minghua Zhang*, Ping Liu, Wuyin Lin, Haiyan Yu
Arie Kaufman, Charilaos Papadopoulos,
Kaloian Petkov, Seyedkoosha Mirhosseini

➤ Evacuation modeling

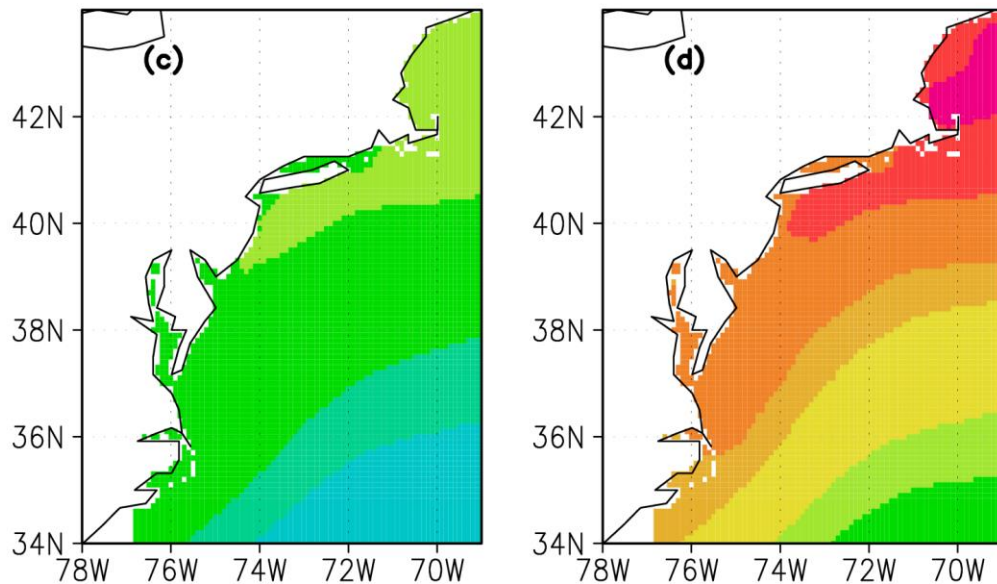
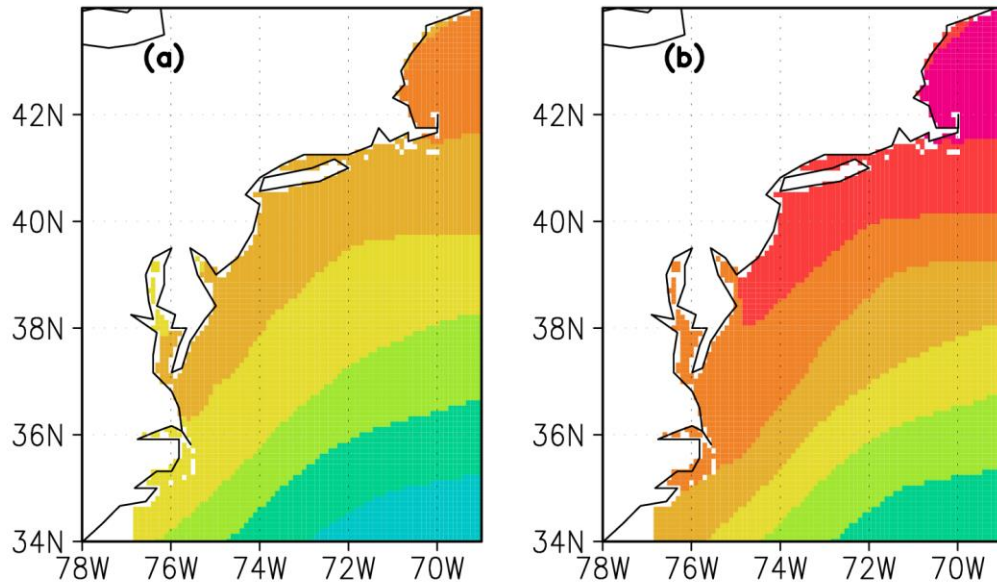
Kaan Ozbay and Team



Approach



(Church et al. 2013)



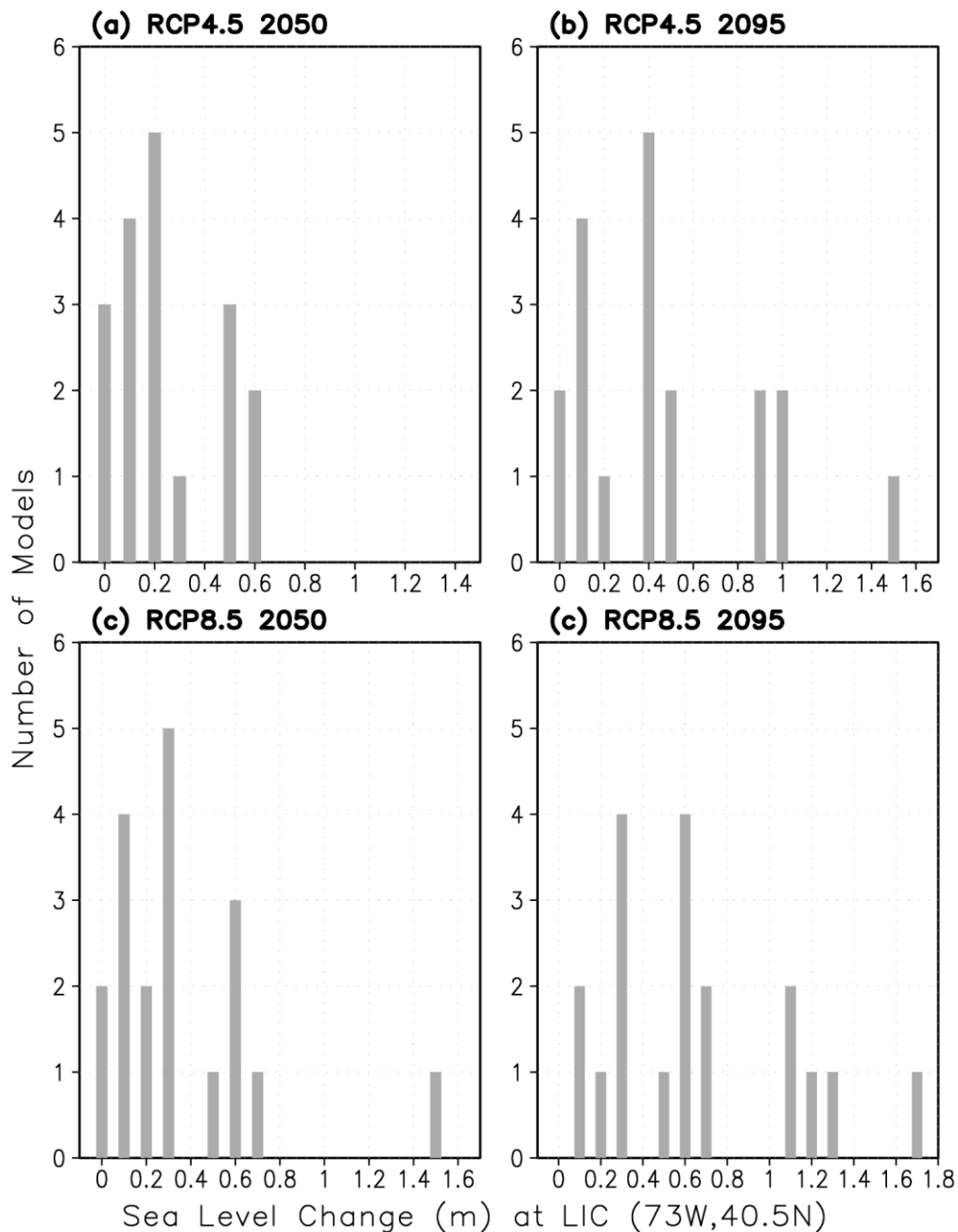
Annual-mean sea level rise (m)
 contributed by SSH and global
 thermal expansion from 19 CMIP5
 models

(a), (b): 2046~2055 – 1996~2005

(c), (d): 2090~2099 – 1996~2005

(a), (c): RCP 4.5

(b), (d): RCP 8.5

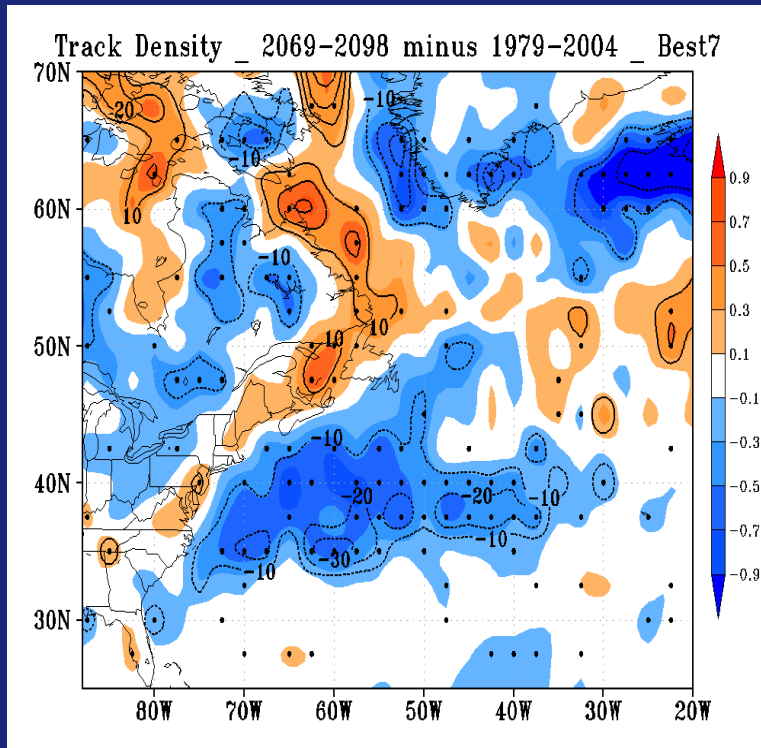


Histogram of annual-mean sea level rise (m) contributed by SSH and global thermal expansion from 19 CMIP5 models. The location is near the coast of the Long Island City, NY (73W, 40.5N). The reference of historical period is 1996-2005 while future periods are 2046-2055 for 2050 and 2090-2099 for 2095.

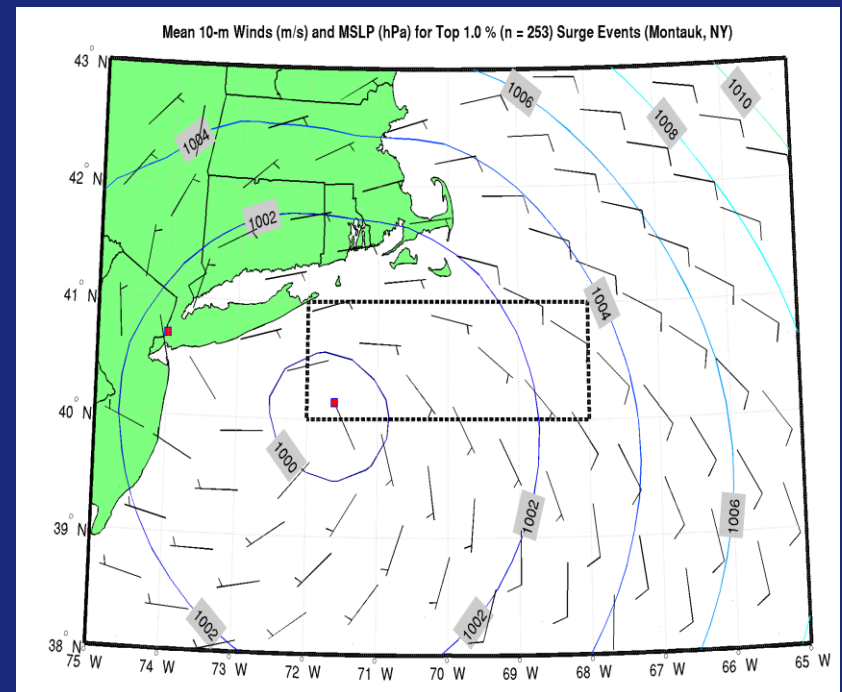
Evaluation of the fidelity of models at the tails of the distribution

Future Storm Surges

Future storms + Storm surge model \longrightarrow Future storm surge estimation

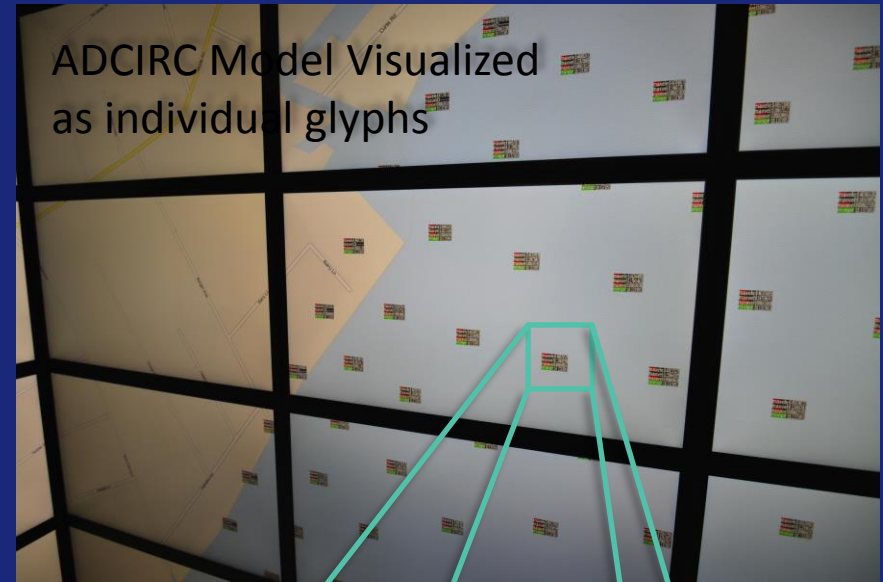
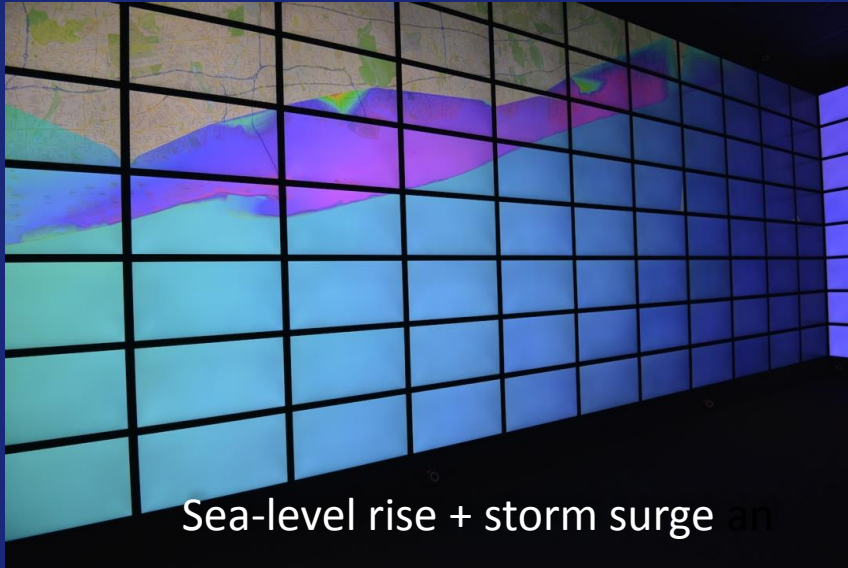


The mean difference in cyclone track density between 2069-2098 and 1979-2004 using the 7 highest ranked CMIP5 global climate models. (Figure 10a Colle et al. 2013)

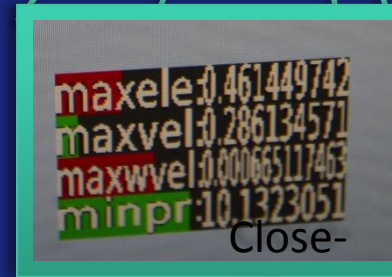


Statistical downscaling (Roberts 2014)

CVC – Results



Visual simulation of storm surge at
street levels



Close-
up

Questions to other Work Units:

Elevation data

- Elevation of MHHW elevation (MEAN HIGHER HIGH WATER - The average height of the higher high waters over a 19-year period)
- NOAA Shallow Coastal Flood areas
- NFIP 1% annual risk (100 year) areas
- NFIP .2% annual risk (500 year) areas
- NFIP A zone
- SLOSH category 3 hurricane areas

Topography and water level over land

