# Tsunami Evacuation Modeling: Seaside-Gearhart

Exploring evacuation difficulty and mitigations options

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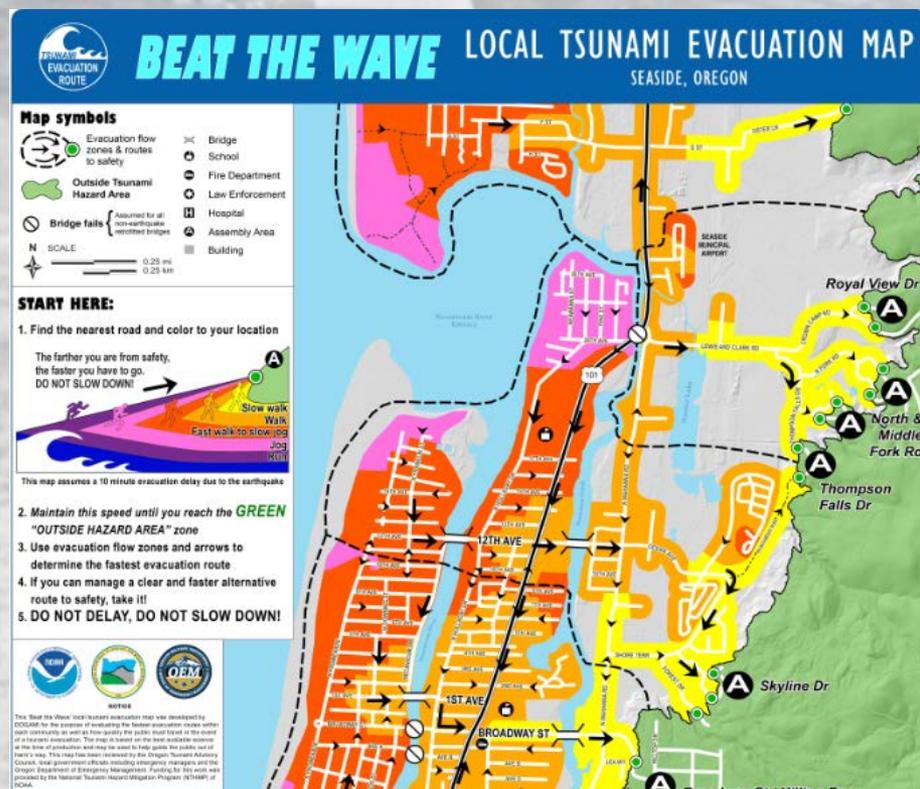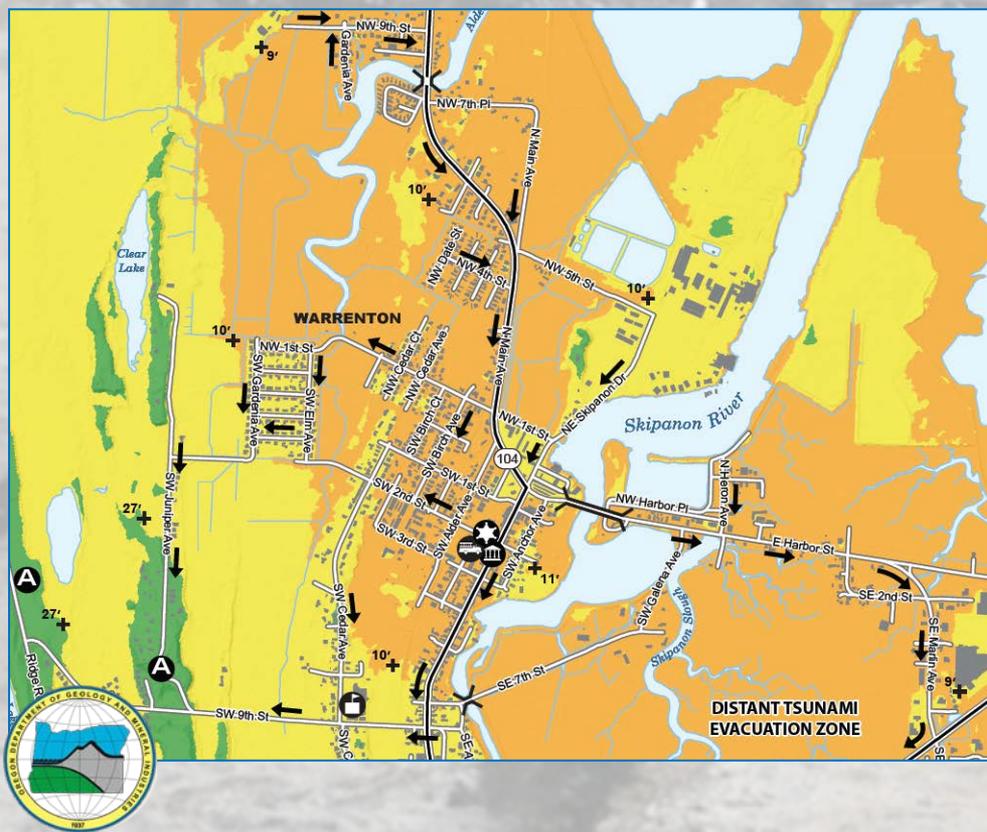
## Beat-the-wave evacuation mapping for tsunami hazards in Seaside, Oregon, USA

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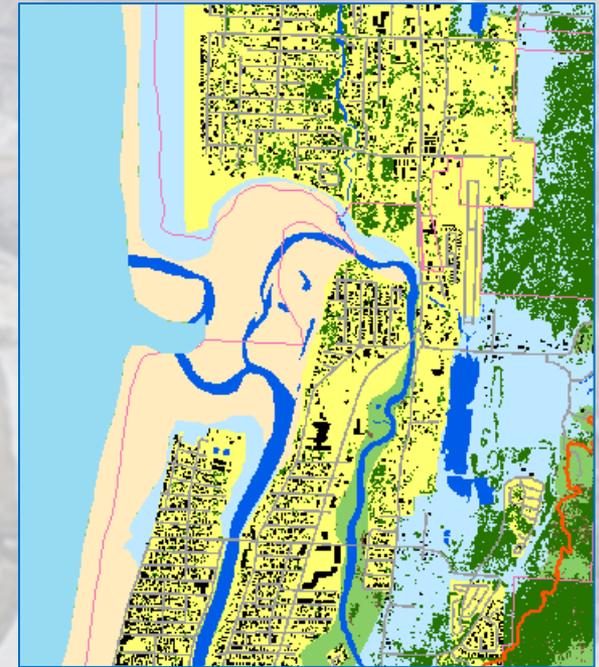
Inputs:

- Land cover
    - Woods & Schmidtlein use full land cover
    - DOGAMI using road network and local input
    - Bridge (retrofitted – y/n)
- Slope
- Tsunami evacuation zone (**XX-Large** and **Large**)
- Data table relating slopes to walking speeds
- Tsunami wave arrival times
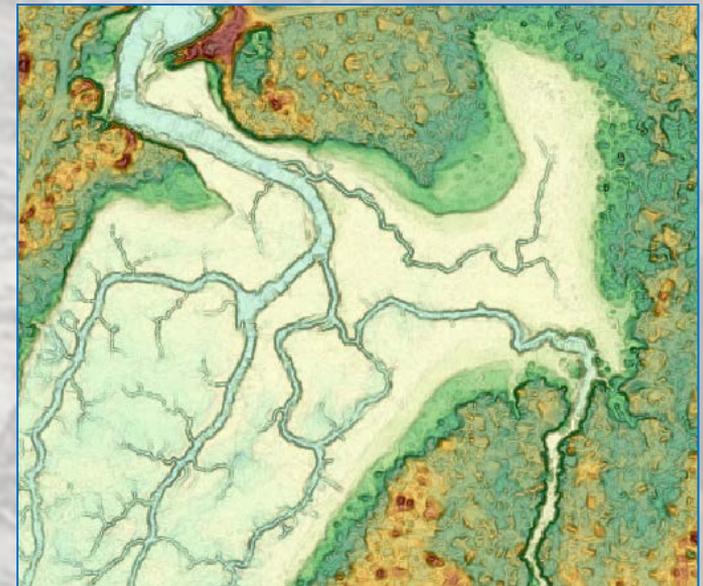
Initial LCD Run (with pre-defined constraints)

12th Avenue Route

Broadway St Route
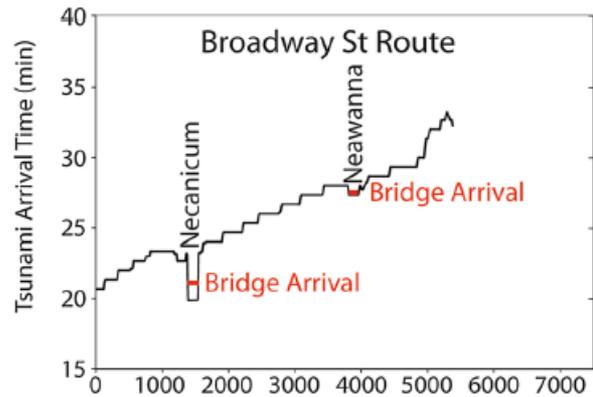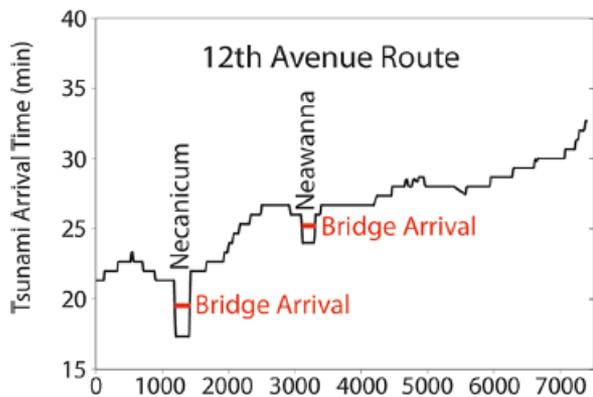
Step 1. Calculate LCD with SCV
 Destination: XXL
 Results: Evacuation routes & watershed boundaries
 Action: Cut DEM at every decision
  point to force routing for
  subsequent iterations to
  match original

cut raster at all "decision points"
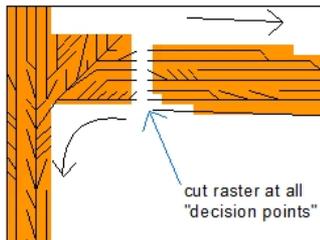
Least Cost Distance (LCD) in feet
**Destination: XXL**

High : 12044.9

Low : 0

0   0.5   1 Mile
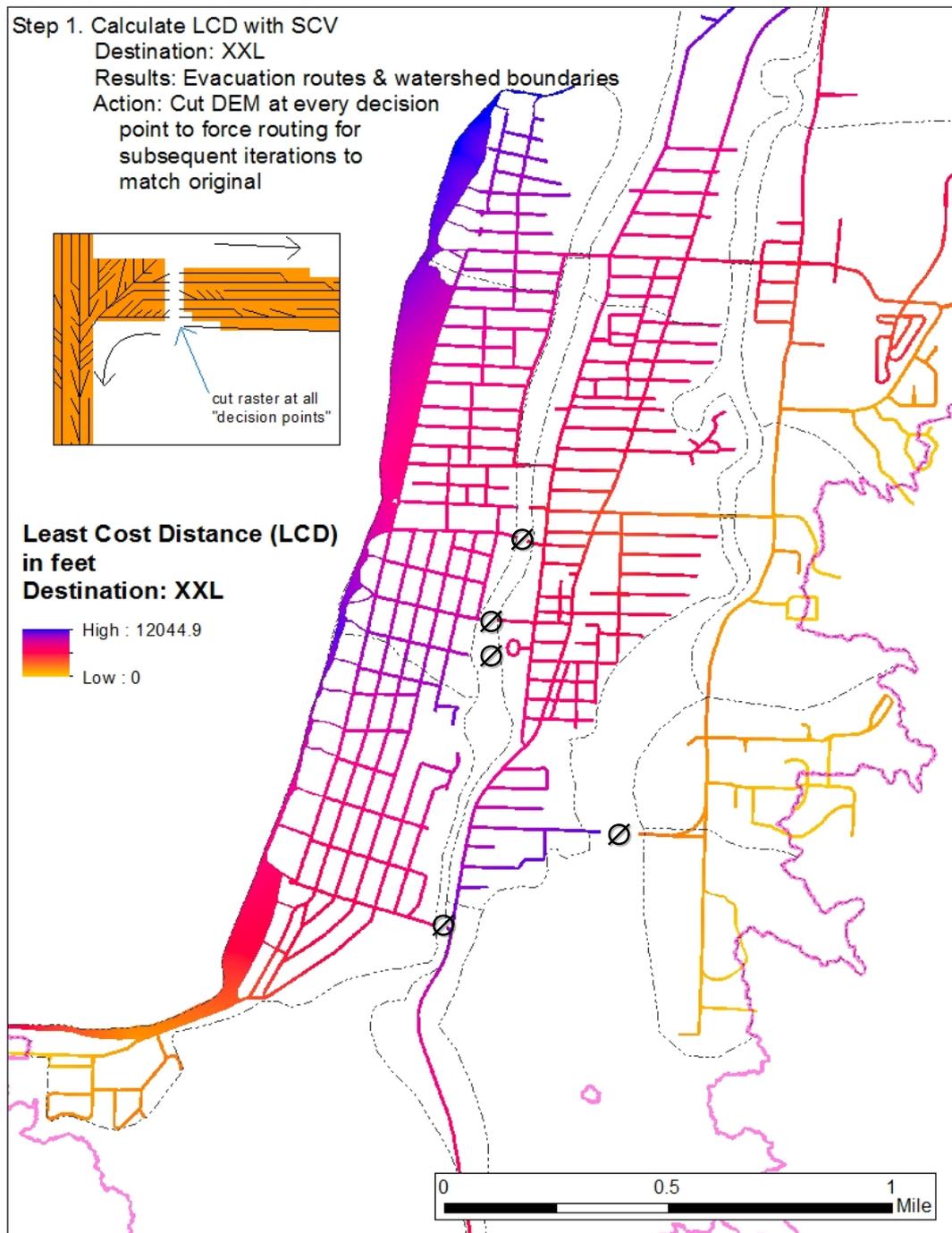
Evacuation Routes & Flow Zones

Visualization of paths leading to most efficient evacuation from every point
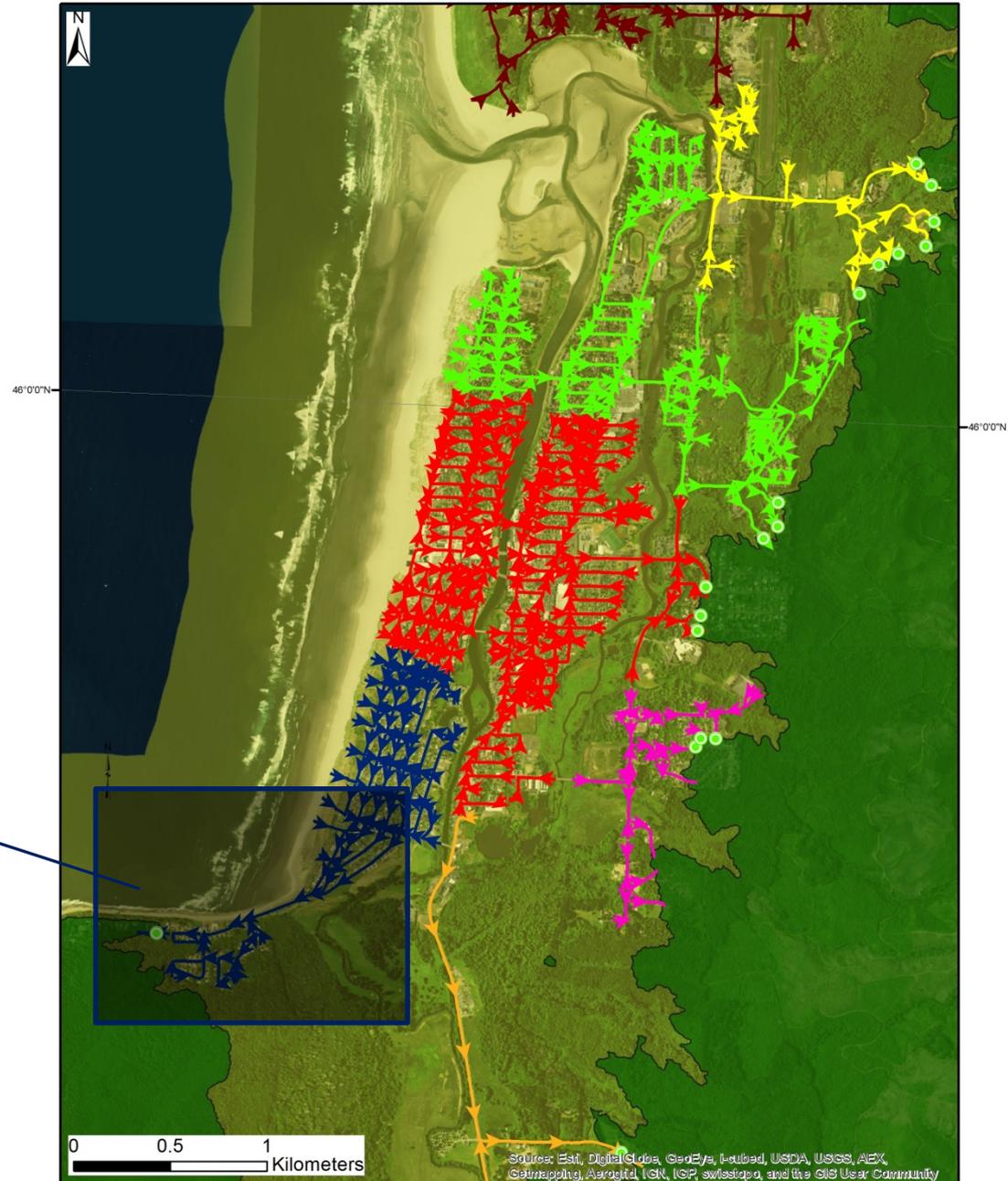
Accounting for Wave Arrival Times

Step 3. Calculate LCD without SCV
   Destination: East bank of Necanicum
      River (blue line)
   Force evacuation along original routes
   Divide LCD by wave arrival time
      AT EACH BRIDGE & associated
      watershed to calculate BTW

Wave arrival, sec

- 600
- 680
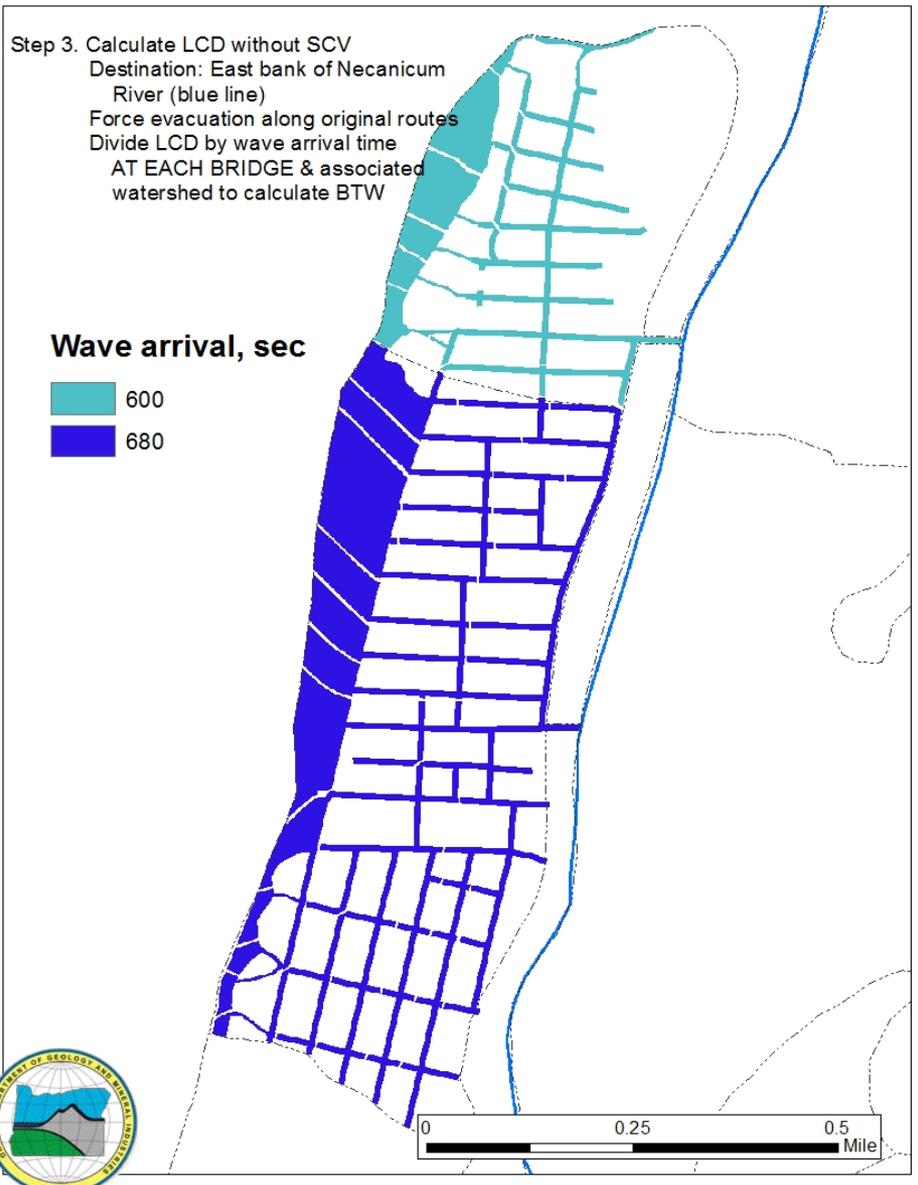
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**Beat the wave (BTW)
feet/sec**

- 0 - 2
- 2 - 4
- 4 - 5.9
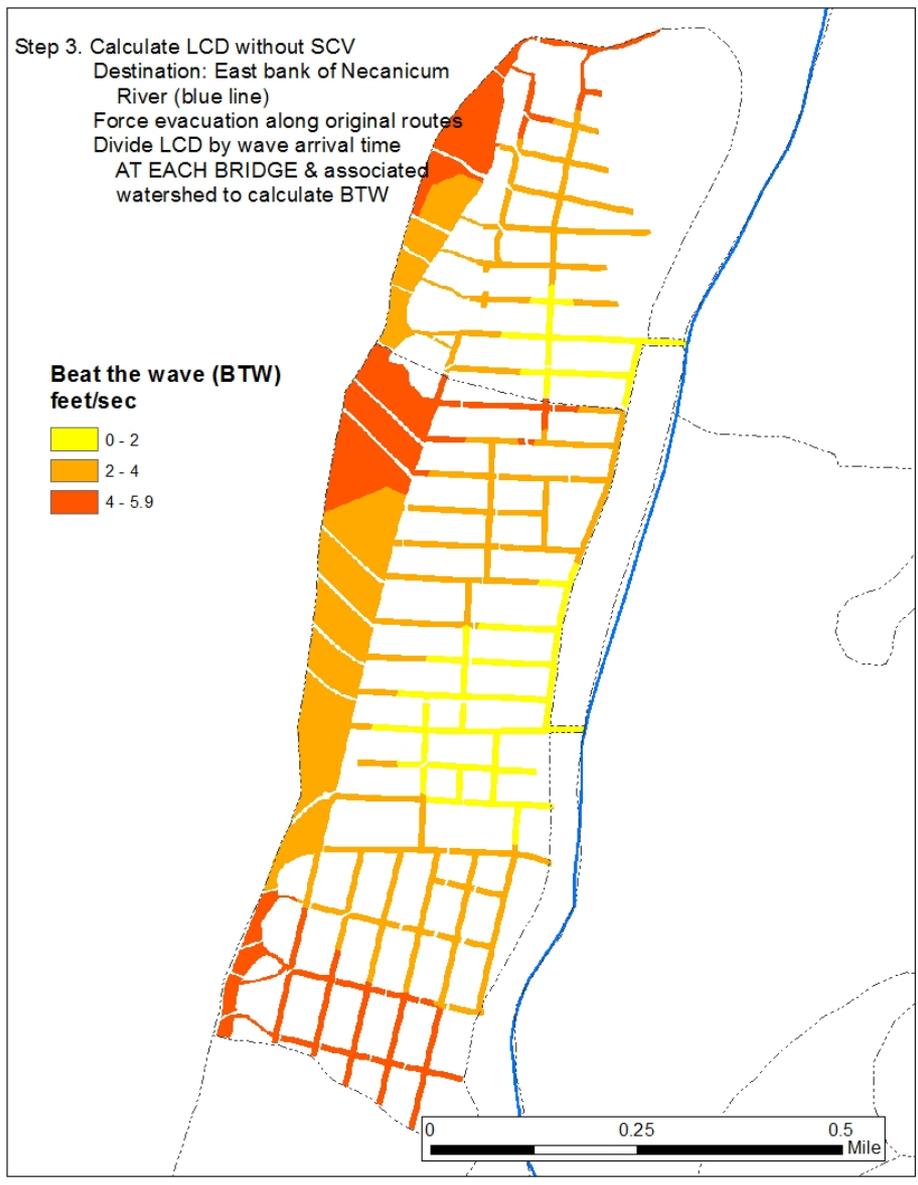
Public Products:

- BTW Maps (Distinct but complementary to our existing evacuation maps). Roll out (Seaside/Gearhart): anytime now.

- Tsunami planning web portal (concept right now). Could include the following layers:
    - Detailed evacuation routes
    - BTW Speeds
    - Flow depths
    - Wave arrival times