



EMERGENCY MANAGEMENT DIVISION

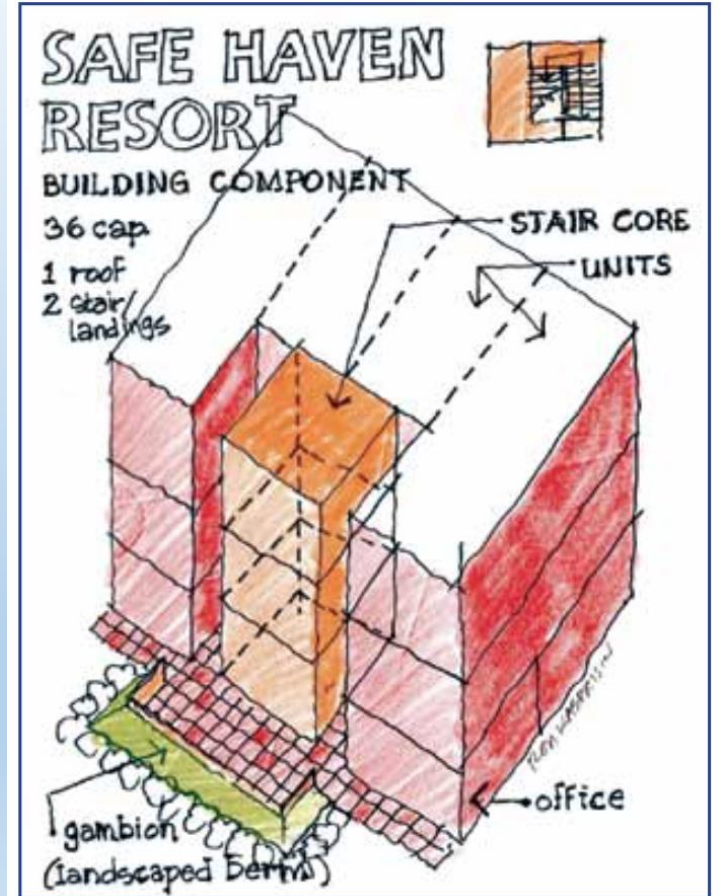
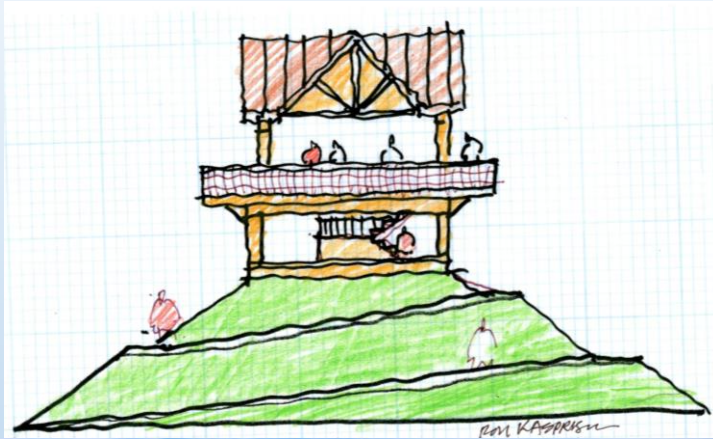
"A disaster-ready and resilient Washington State"

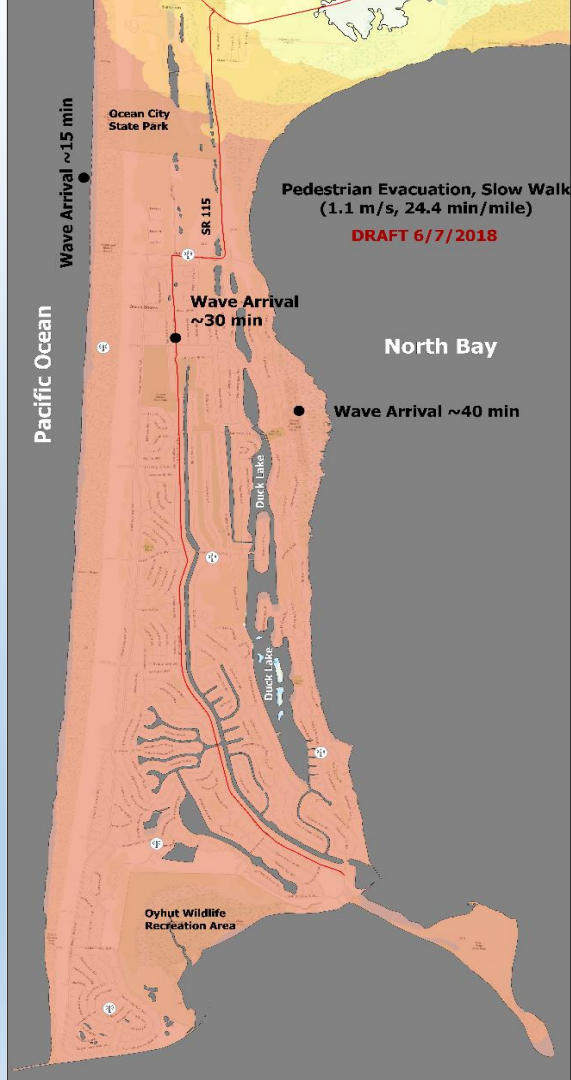


Maximilian Dixon – Hazards and Outreach Program Supervisor

Project Safe Haven

2011
2016
2018





Manual

for

Tsunami

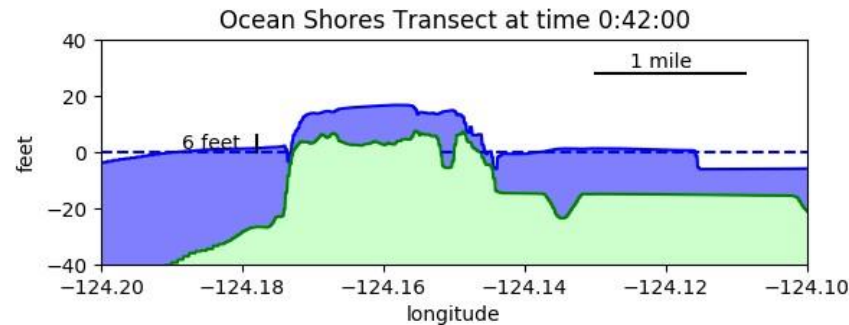
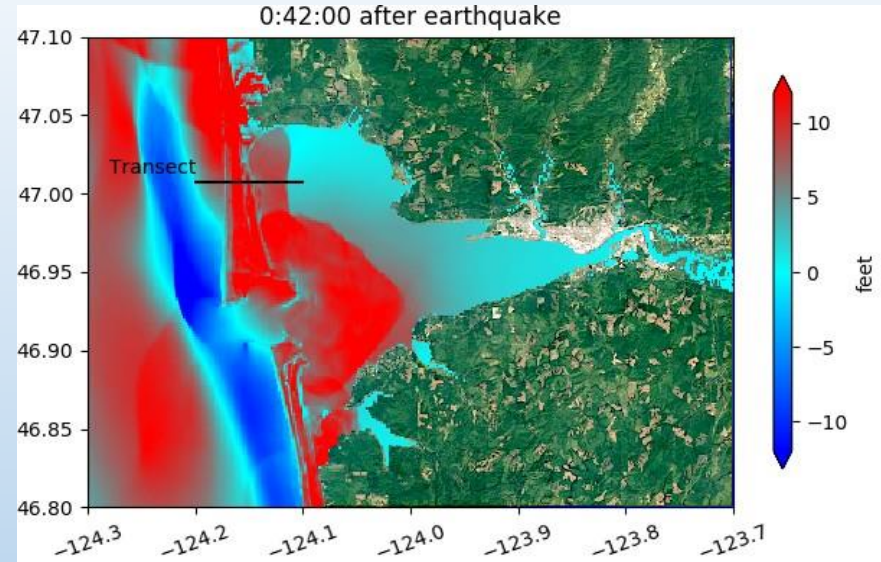
Vertical
Evacuation
Structures



7 Phases to Building Vertical Evacuation Structures

Phase 1: Involve Emergency Management Partners

Phase 2: Assess Tsunami Risks and Current Evacuation Options



7 Phases to Building Vertical Evacuation Structures

Phase 3: Engage the Community

- Review past efforts by your community and other communities.
- Hold public meetings in your community to discuss tsunami risk and mitigation options.
- Identify a trusted community leader who will manage the overall process.
- Manage an open process from start to finish.
- Establish a Stakeholder Committee.

7 Phases to Building Vertical Evacuation Structures

Ocean Shores Survey Card Results (June 12, 2018)

Total Responses: 53

Question 1: *How certain are you that tsunami refuges could save your life and/or the lives of people in your community?*

Strong Certainty: 46/53: **87%**

Moderate Certainty: 6/53: **11%**

No Response: 1/53: **2%**

Understanding community participation of tsunami vertical-evacuation planning in the coastal Washington communities: key findings from 2018 focus groups and interviews

David Johnston, Caroline Orchiston, Lucy Carter, Kate Boersen

Long Beach, Tokeland, Ocean Shores, Westport

Recommendations

Funding- Communicate the annual or monthly cost of the structure for an individual person, rather than the total cost of the structure. Focus on the “additional” cost of vertical evacuation to proposed structures (e.g. 20% more to incorporate vertical evacuation standards into a building that is already planned vs. the total cost)

Dual or Multi-purpose designs- There was strong support for dual purpose design.

Trust and Communication - Open and honest conversations need to continue throughout the development of vertical evacuation structures.

Phase 4: Identify and Evaluate Potential Sites

Explore potential sites. Consider the following:

- The identified sites in the *Project Safe Haven* reports
- Incorporating vertical evacuation into upcoming new projects
- Sites near population densities and children (i.e., schools)
- Neighborhood sites
- Sites that are on high ground and inland

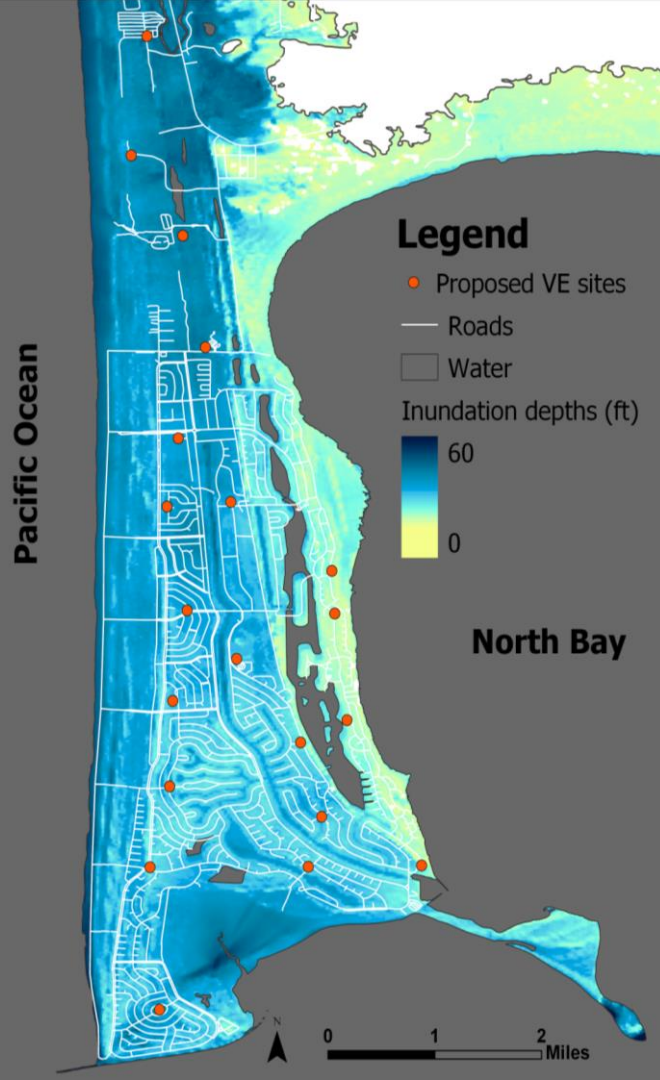
Explore potential structure-type options for the site.

Project Safe Haven

20 total proposed sites

Potential capacity for 9,200 people

Shallower inundation requires shorter design height

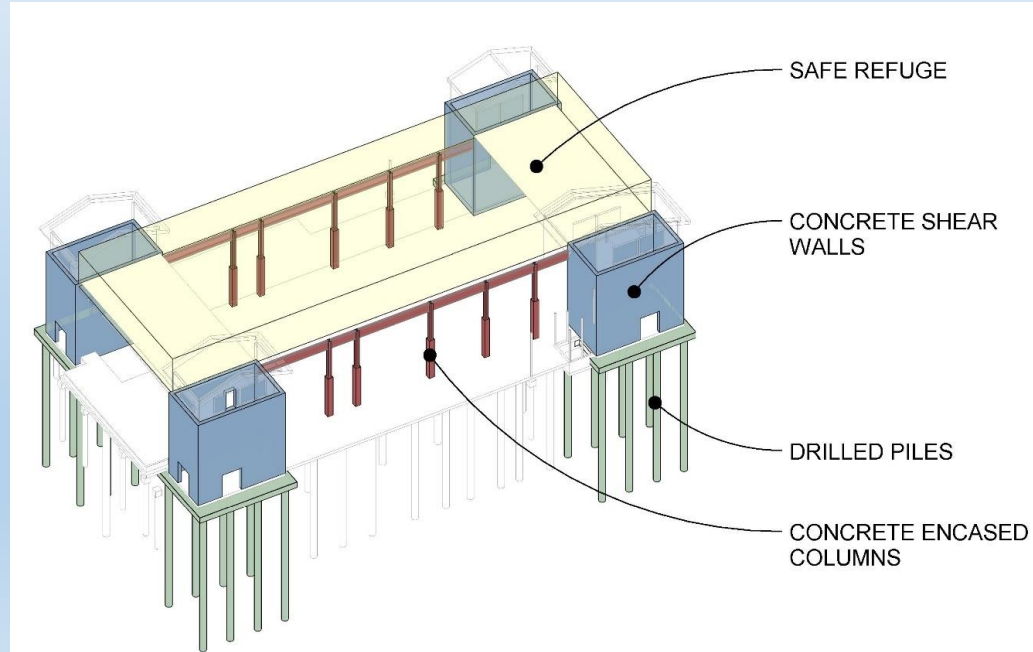


Ocosta Elementary School: Vertical Evacuation Building

1,000 person capacity (8,500 sf Safe Refuge)

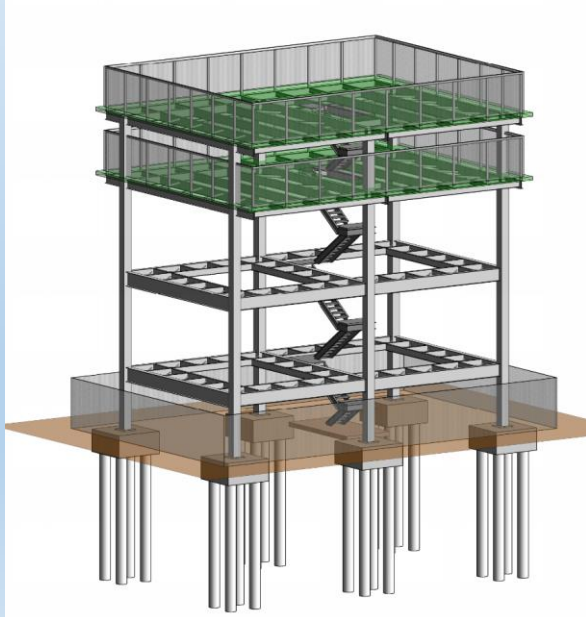
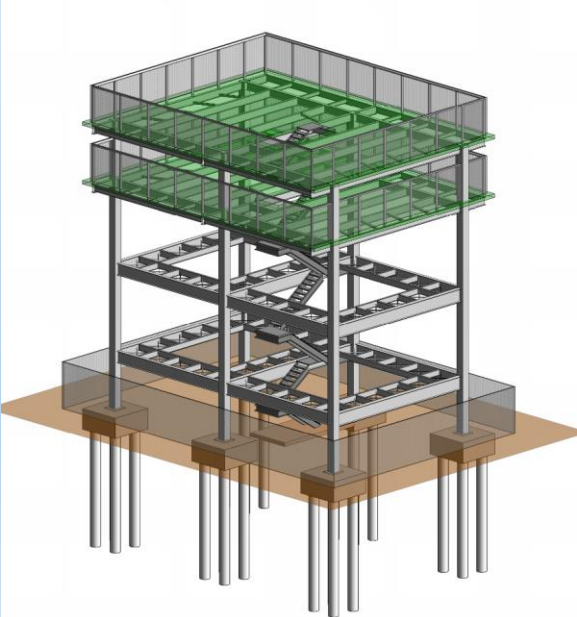
53' Refuge Elevation (28' above grade)

Concrete Walls, Steel Roof Structure, Pile Foundations

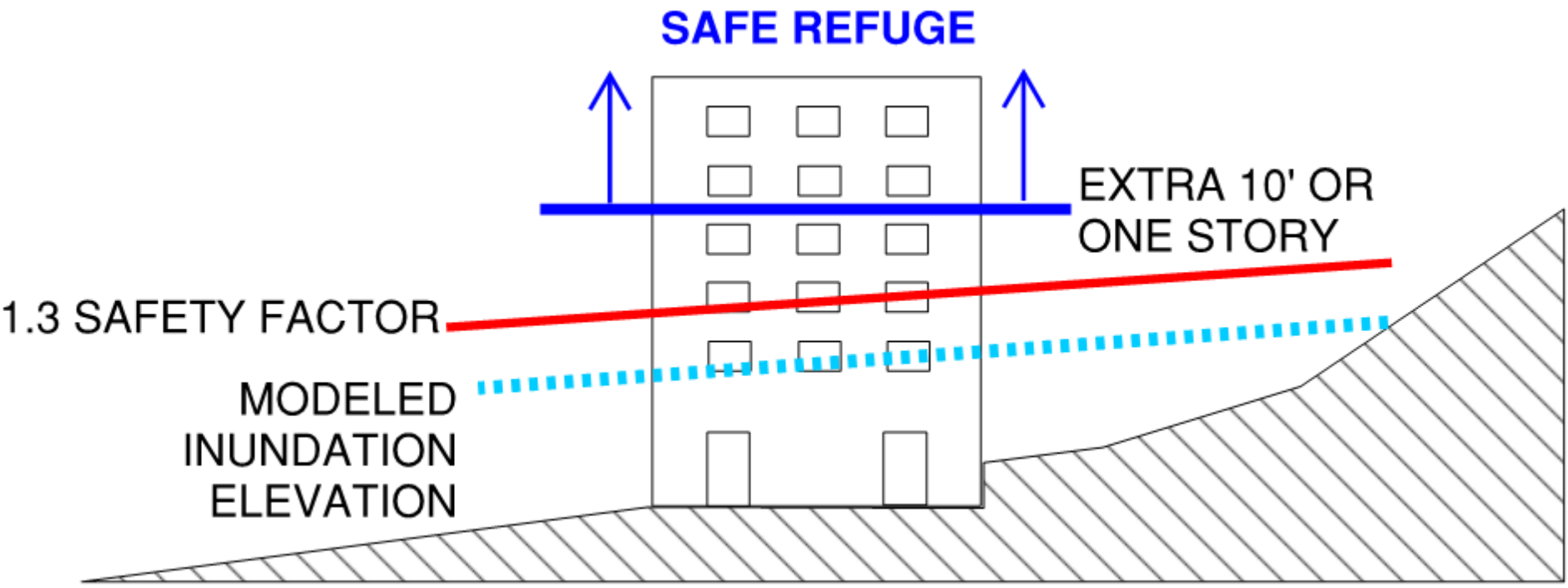


Shoalwater Bay Tribe: Proposed Evacuation Tower

400 person capacity (4,000 sf Safe Refuge)
Safe Refuge Floors at 40' & 50' Above Grade
Steel Structure, Concrete Floors, Pile Foundations



Vertical Evacuation Design: Minimum Elevation



Phase 5: Develop a Funding Plan with Alternatives

- Assess potential funding sources.
- Apply for grants.
- Prepare a backup plan if some funding sources do not come through.
- Build public support for local funding initiatives.
- Maintain open and frequent communications with your community.

HMA Grants Help Design & Build Tsunami Safe Areas

In **2013**, Ocosta Elementary School's Grant proposal proved Safe Haven projects are eligible for HMA grants.



Since then...



2017: HMGP Grant - *ongoing*: Pacific County Fire District VES Design

2018: PDM Grant - *awarded*: Shoalwater Bay Tribe VES Tower

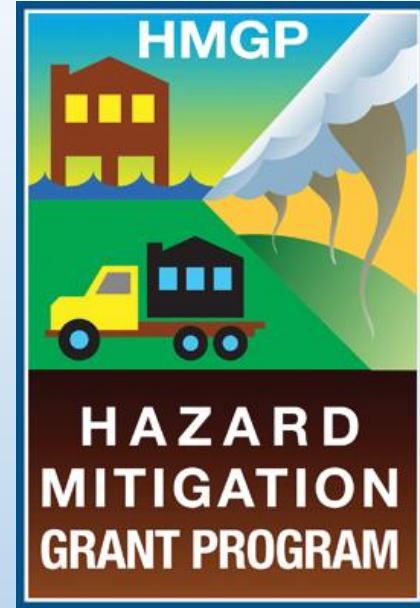
2019: PDM Grant - *applied*: Ocean Shores, Aberdeen School District

Westport



Hazard Mitigation Grant Program (HMGP)

- **Cost Share:** 75% Federal, 12.5% State, 12.5% Local (applicant)
- **Period of Performance:** 3 years to complete work
- **Competitive Statewide** (not nationally)
- **Frequency:** Available after Federal Disaster Declarations in WA
- **Who's Eligible:** Counties, Cities, Fire Districts with FEMA-approved Hazard Mitigation Plans. *Grays Harbor & Ocean Shores: Eligible in 2-4 months.*
- **Funding Amount:** Varies (depends on size/scale of disaster event)

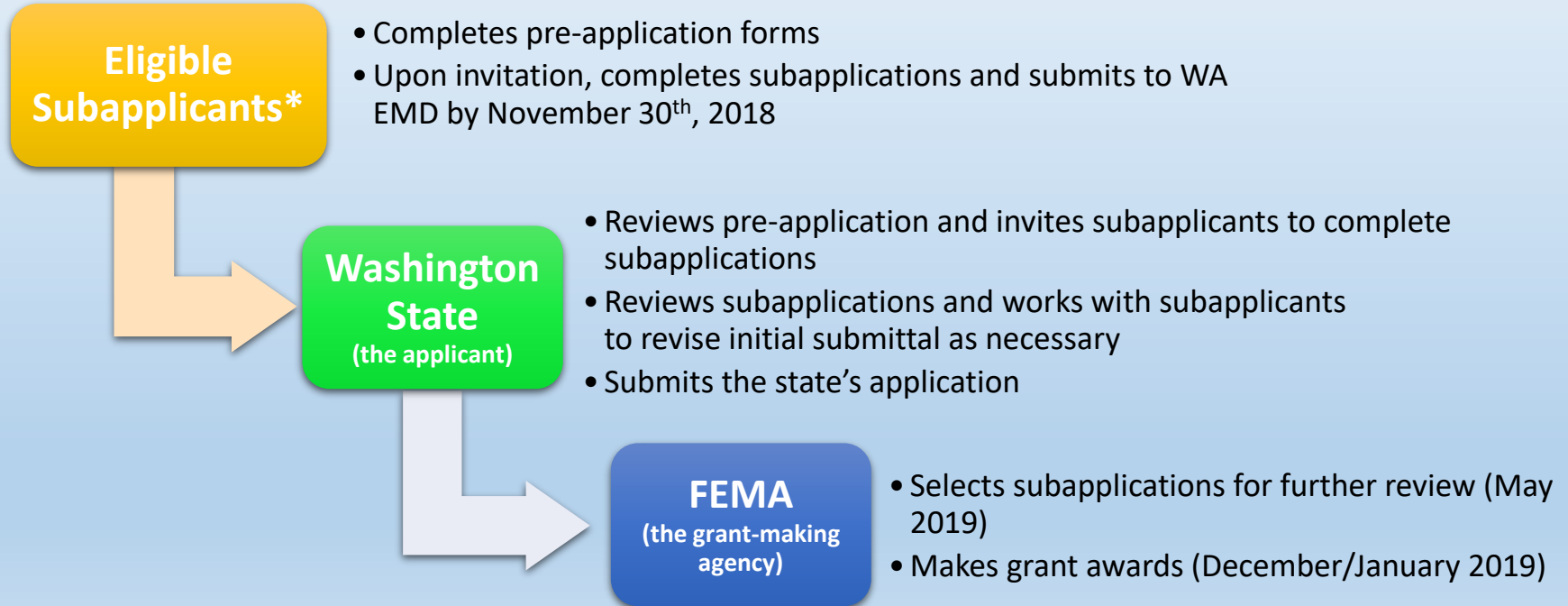


Pre-Disaster Mitigation (PDM) Competitive Grant Program



- FEMA's only grant program that reduces the risks from natural hazards *prior* to a catastrophic disaster occurrence.
- Nationally-competitive grant program with a 25% non-federal cost share (FEMA funds 75% of the project).
- Funding this year is up to \$235 million, from \$90 million last year (a 161% increase).
- This is the same program that proved the eligibility of tsunami vertical evacuation for FEMA grants in 2013, finally funding one in 2018 (Tokeland).

PDM Application Process



*Eligible subapplicants for PDM are local governments/communities with a current, FEMA-approved hazard mitigation plan.

Eligible Subapplication Components

Pre-Award Costs

- Staff training necessary to complete application
- Staff time developing the application
- Tsunami modeling
- Feasibility studies and/or technical [engineering] evaluation
- Benefit-Cost Analysis (BCA)

Post-Award Costs

- Site investigation and determination
- Acquisition of vacant land or real property
- Architectural/engineering design
- Peer review
- Permitting/inspections
- Construction

Phase 6. Assemble Project Team, Complete Design

- Create a selection process to hire project team members.
- Finalize the project team once funding is secured.
- Confirm your internal project manager.
- Conduct design peer review.
- Conduct site specific tsunami modeling.
- Confirm the design and capacity considerations for the evacuation structure.

Phase 7. Oversee Construction, Completion, and Operation

Celebrate your newly constructed structure!



Next Step

TSUNAMI VERTICAL EVACUATION STRUCTURE GAP ASSESSMENT

Questions?

- mil.wa.gov/tsunami
- mil.wa.gov/earthquake
- **FEMA P-646: Guidelines for Design of Structures for Vertical Evacuation from Tsunamis**
<https://www.fema.gov/media-library/assets/documents/14708>