FEMA

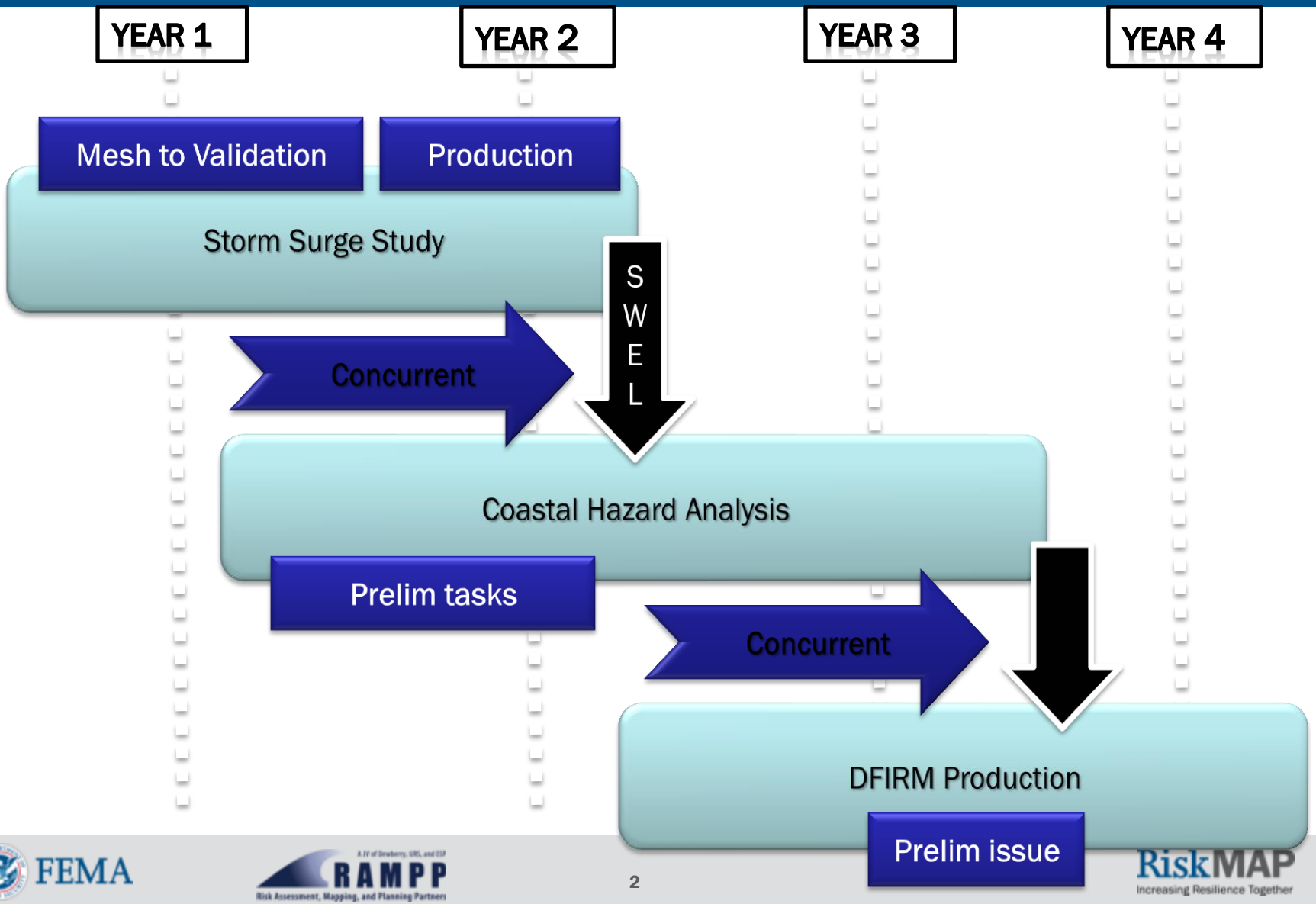
Overland Wave Modeling and Mapping

FEMA RII Technical Briefing
New Jersey/New York City Coastal Flood study

RiskMAP
Increasing Resilience Together

A JV of Dewberry, URS, and ESP
RAMPP
Risk Assessment, Mapping, and Planning Partners

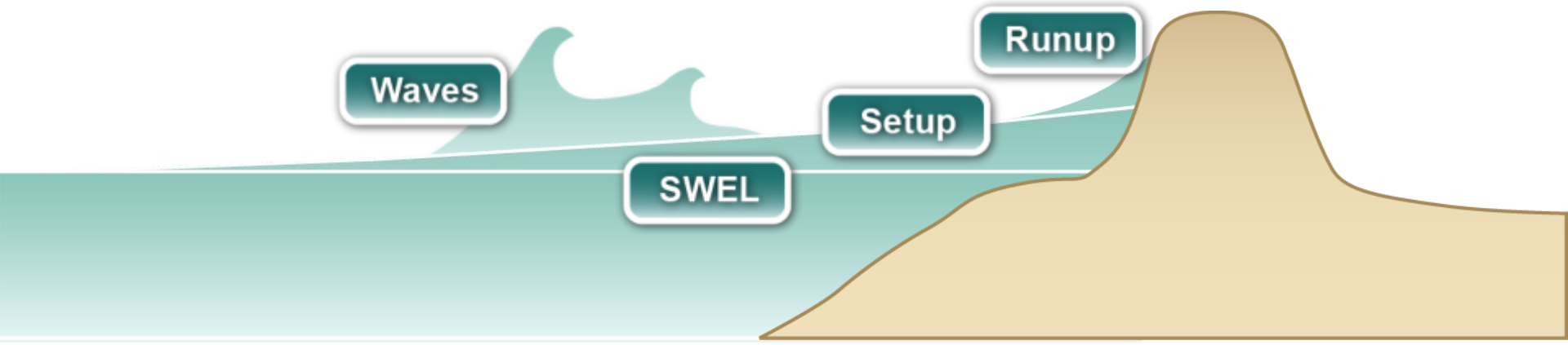
Project Life-cycle



Basic Elements of a Coastal Floodplain Study

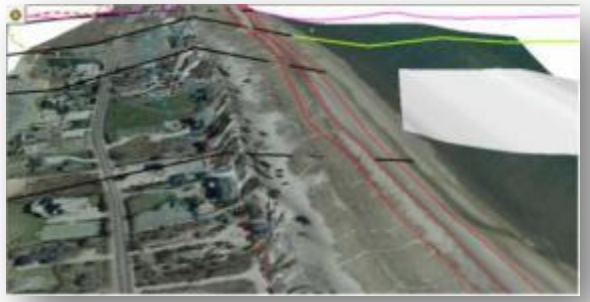
Base Flood Elevation on FIRM includes 4 components:

1. Storm surge stillwater elevation (SWEL) – (USACE)
2. Amount of wave setup – Determined from ADCIRC Model (USACE)
3. Wave height above storm surge (stillwater) elevation
4. Wave runup above storm surge elevation (where present)



Wave Height Analysis Status

- **Modeling set-up**
  - Transect Layout completed
  - Field Reconnaissance completed
  - Obstruction carding completed
  - Development of a seamless (topo/bathy) Digital Elevation Model (DEM)
- **Wave height analysis (waiting on surge results)**
  - Starting wave conditions (wave height and period)
  - Wave setup – Determined from the ADCIRC model
  - Dune/Bluff erosion
  - WHAFIS modeling for overland wave height computation
  - Wave Runup
  - Coastal Hazard Mapping



Overland Wave Modeling Tasks

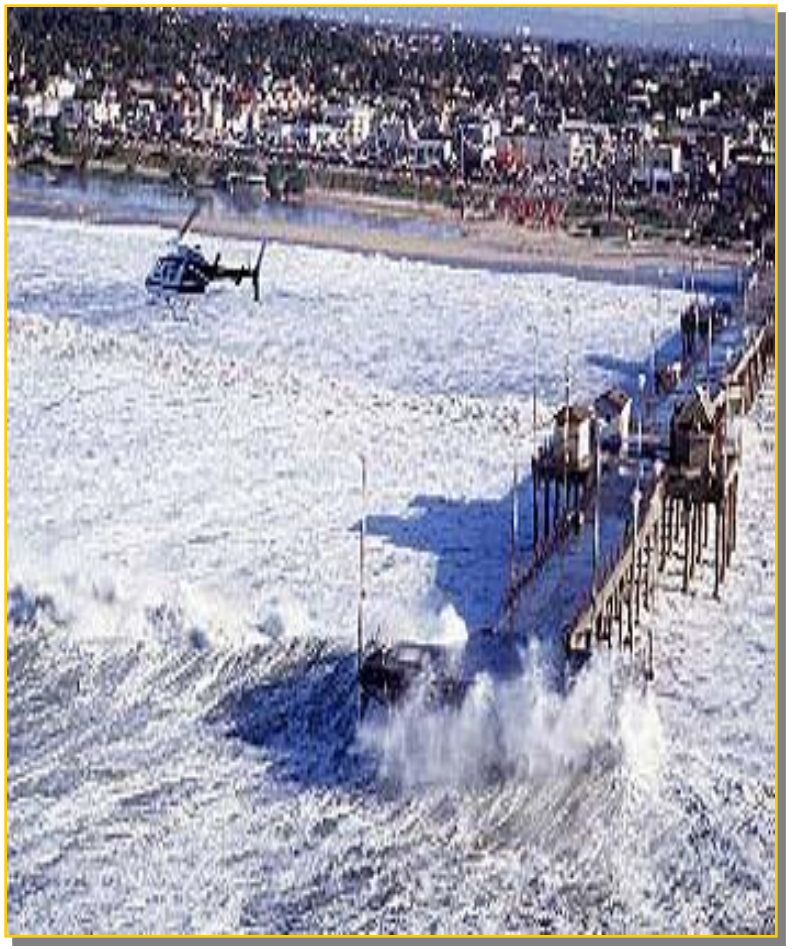
BEFORE STORM SURGE

- Bibliography, Data and Model Research
- DEM Development
- Database Creation
- Process Base Data
- Transect Layout (Published and Mapping)
- Field Work
- Obstruction Carding (including landcover data setup)
- Primary Frontal Dune (PFD) Delineation
- Initial Model Runs

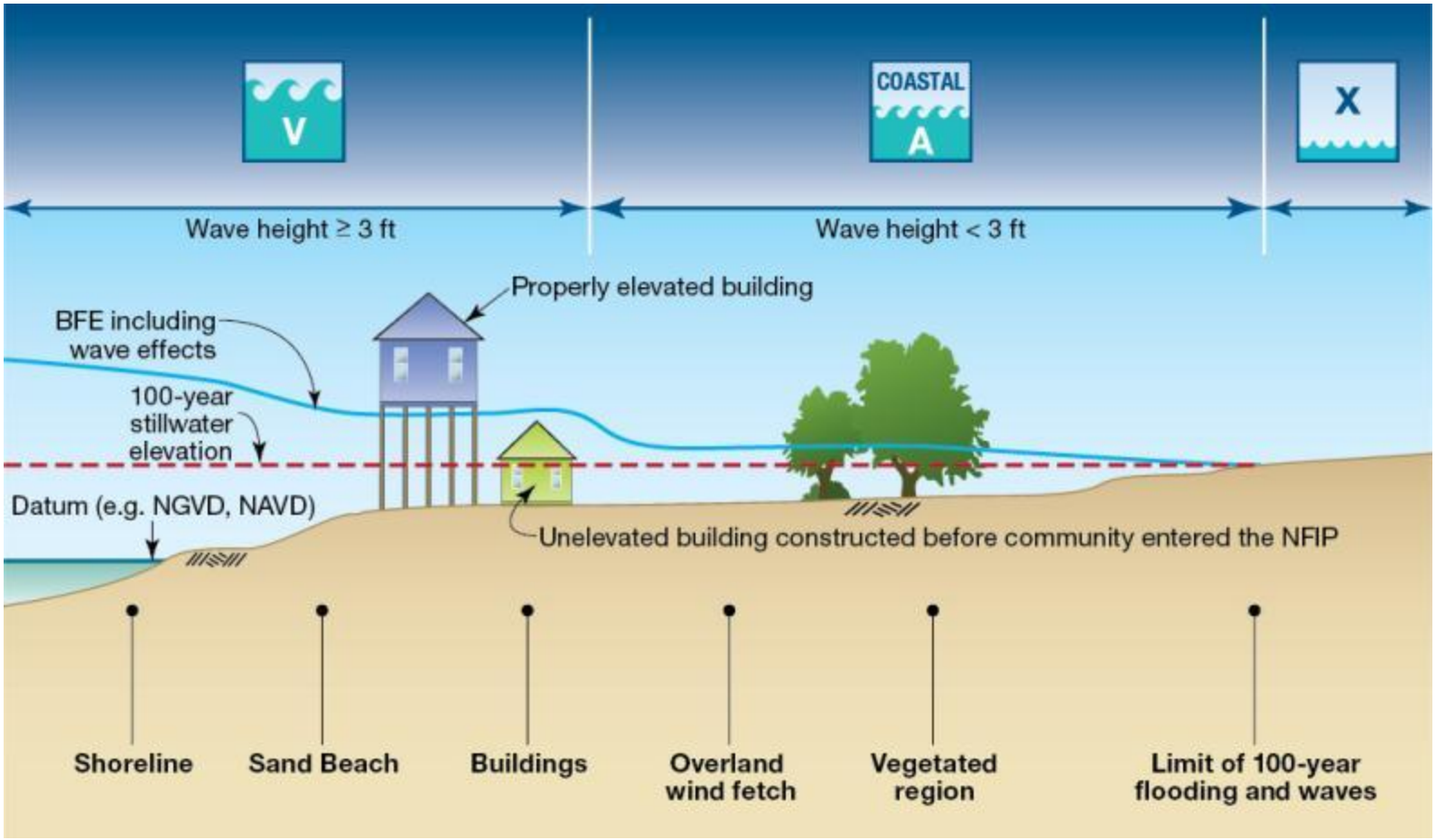
Overland Wave Modeling Tasks

AFTER STORM SURGE

- Stillwater Surface Creation
- Wave Setup Calculation
- Erosion Analysis
- WHAFIS Simulations
- Run-up Analysis
- Delineate Coastal Floodplain
- Develop DFIRMs
- FIS and TSDN



Mapping


V
COASTAL
A
X
Wave height ≥ 3 ft
Wave height < 3 ft
Properly elevated building
BFE including wave effects
100-year stillwater elevation
Datum (e.g. NGVD, NAVD)
Unelevated building constructed before community entered the NFIP
Shoreline
Sand Beach
Buildings
Overland wind fetch
Vegetated region
Limit of 100-year flooding and waves

Limit of Moderate Wave Action (LiMWA)

- Defined by the area subject to wave action with waves greater than 1.5 feet in height