

LIP Ratios and Estimates for Durations Less Than 1-Hour

Duration	5 Minutes	15 Minutes	30 Minutes
Ratio to 1 Hour LIP	0.32	0.50	0.73
LIP	19.4 in. x 0.32 = 6.21 in.	19.4 in. x 0.50 = 9.70 in.	19.4 in. x 0.73 = 14.16 in.

Reference: NOAA, 1982.

Legend:

- ★ Turkey Point Nuclear Generating Station Units 3&4 (PTN)

Document Name: FPL062-GIS-A015
 By: MLS Date: 2/8/2013

Figure 4-1

HMR52 – 1-hour 1-Square Mile PMP

**Flooding Hazard Reevaluation
 Turkey Point Nuclear Generating Station Units 3&4 (PTN)**

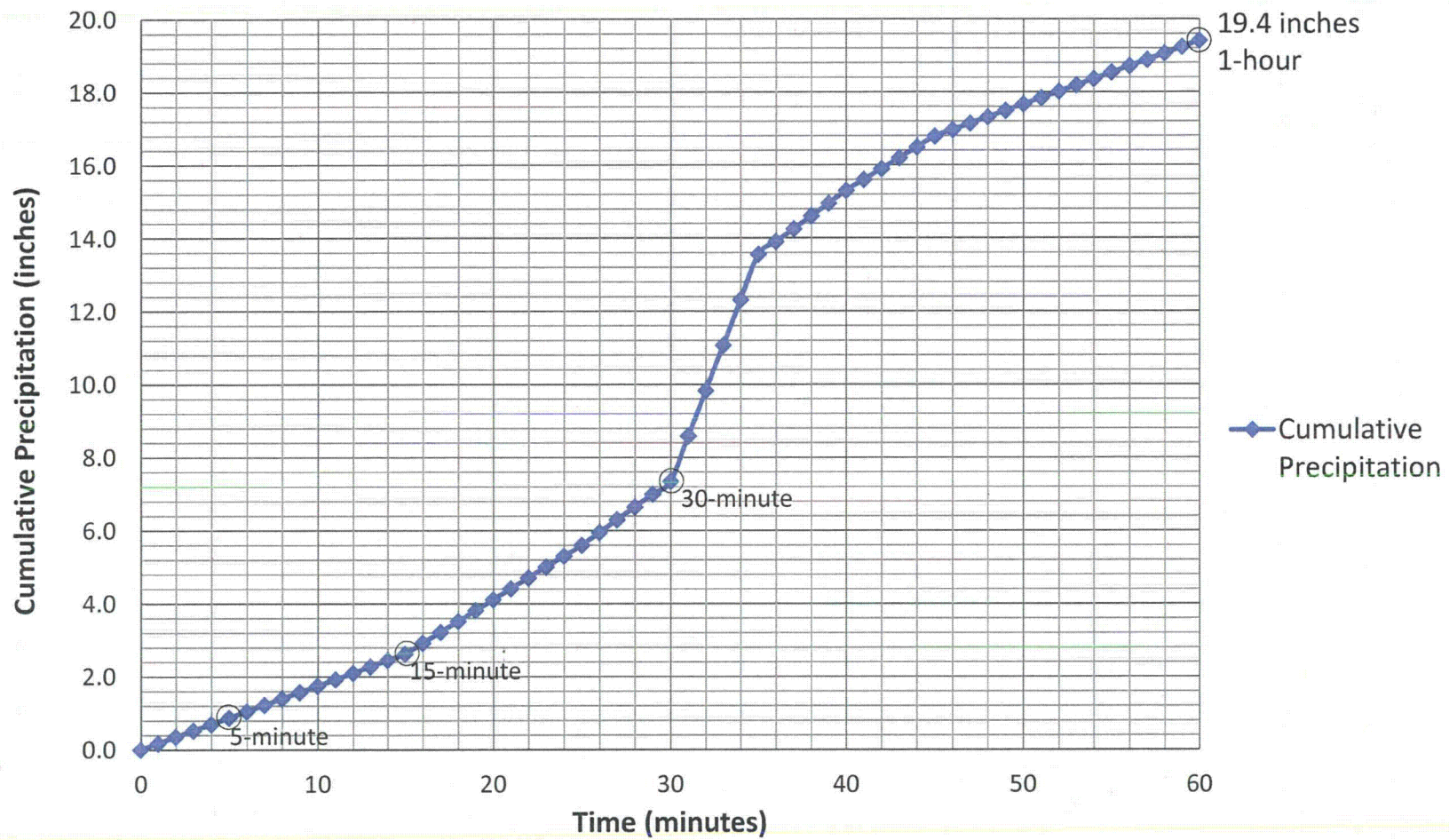


Figure 4-2

60 Minute Local Intense Precipitation (LIP) Curve

Flooding Hazard Reevaluation
Turkey Point Nuclear Generating Station Units 3&4 (PTN)

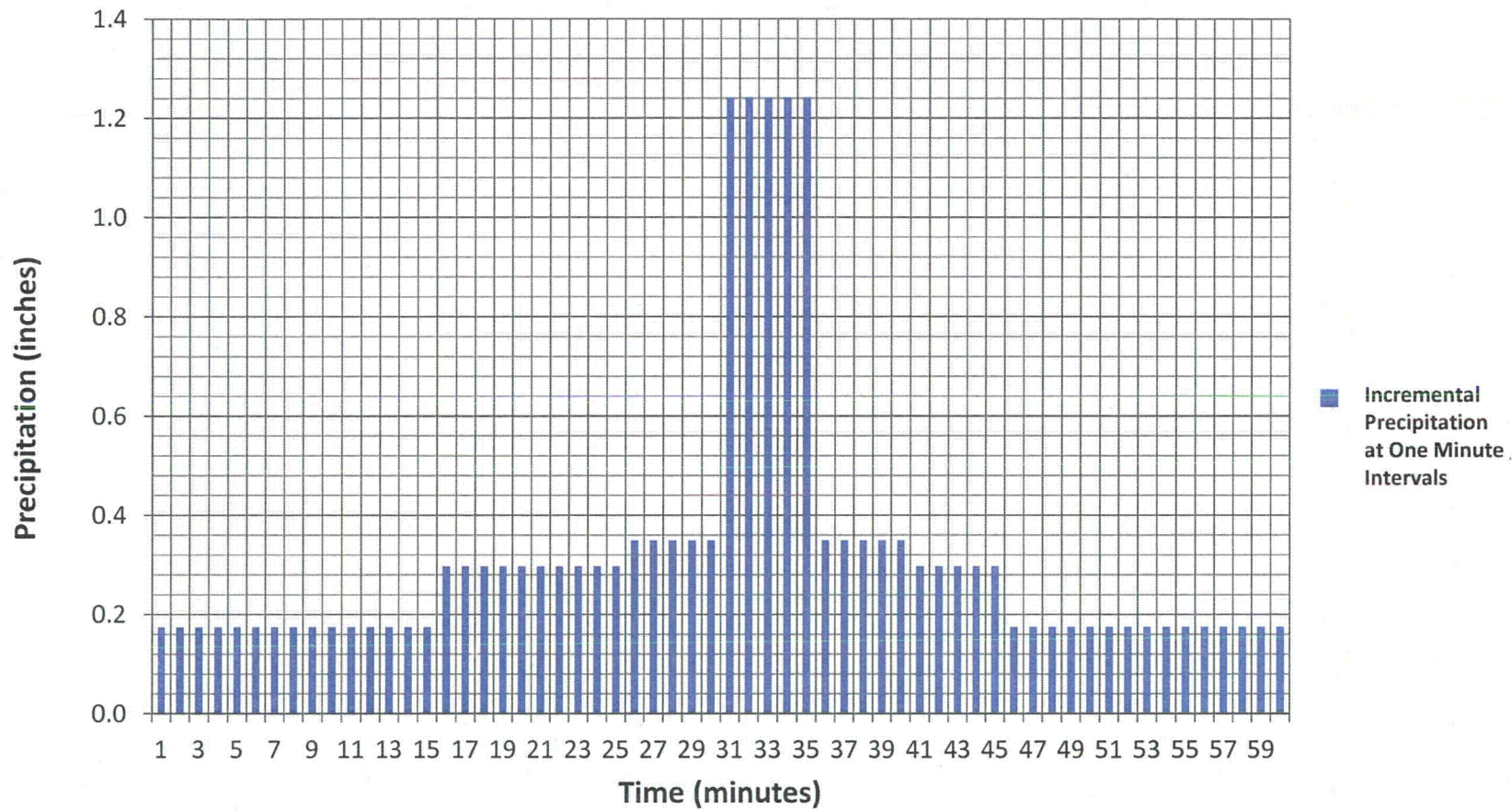


Figure 4-3

Local Intense Precipitation (LIP) Distribution

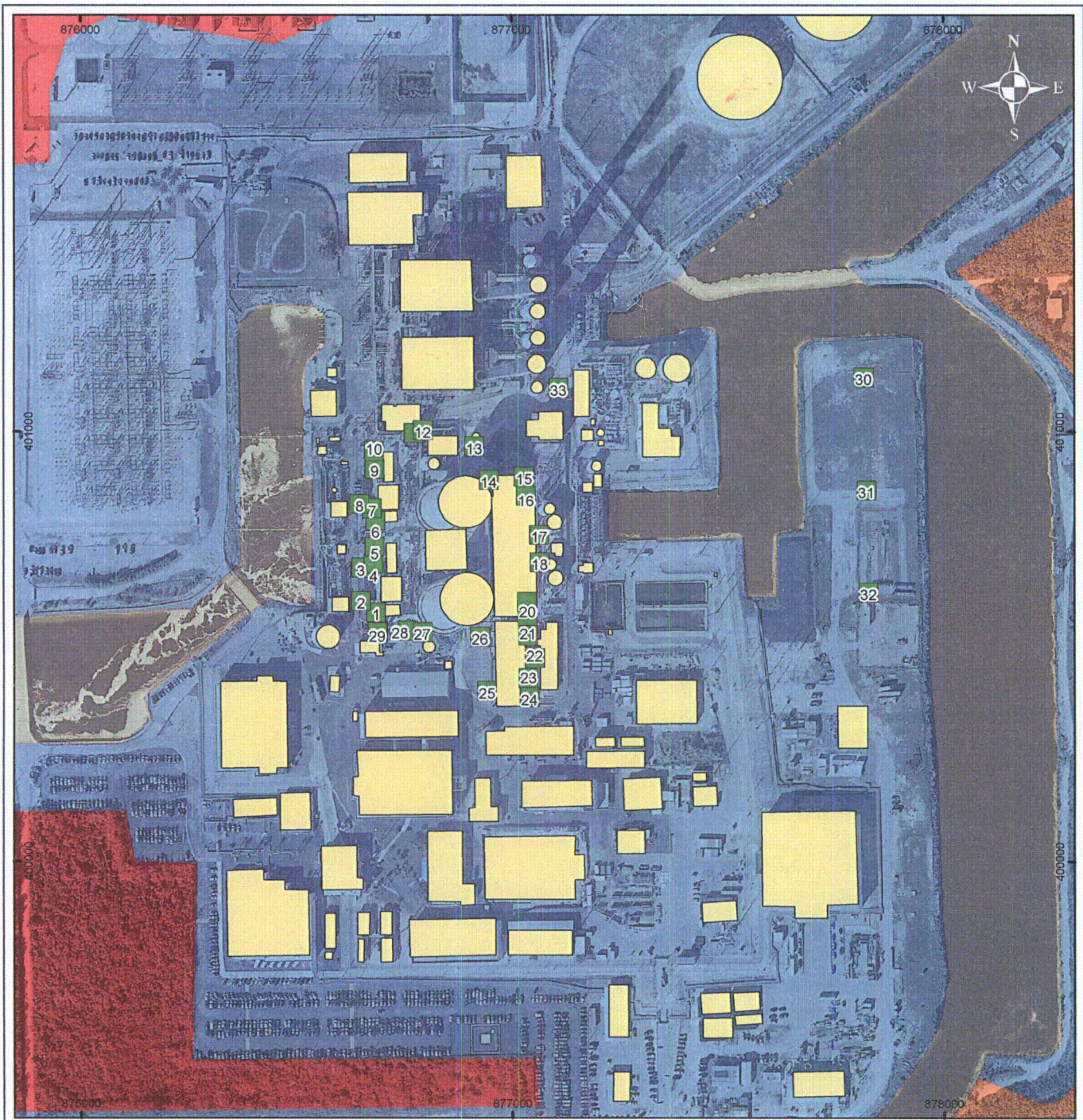
Flooding Hazard Reevaluation
 Turkey Point Nuclear Generating Station Units 3&4 (PTN)



Figure 4-4

Elevations Rendered on the Study Area Grid

Flooding Hazard Reevaluation
Turkey Point Nuclear Generating Station Units 3&4 (PTN)



References: 1. SFWMD, 2008.

Legend

- Points of Interest
- Structures
- Manning's n 0.02
- 0.025
- 0.08
- 0.10
- 0.12

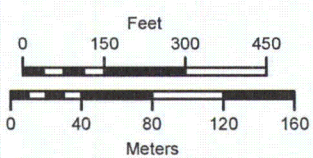
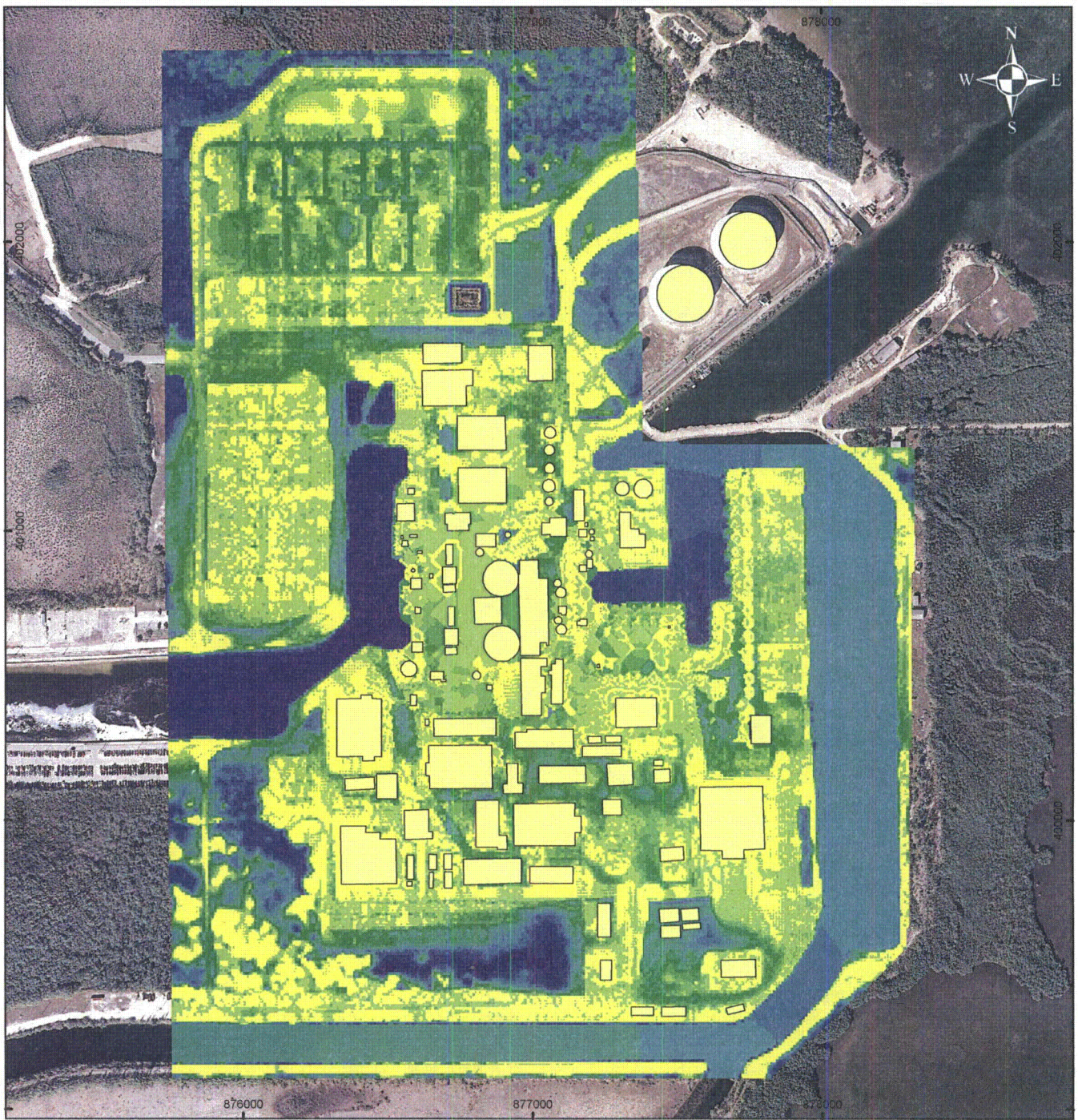


Figure 4-5

Manning's n Value
Flooding Hazard Reevaluation
Turkey Point Nuclear Generating Station Units 3&4 (PTN)

Document Name: FPLTP077-GIS-A021
 Projection: State Plane Florida East, NAD 83 (US Feet)
 By: MLS Date: 01/06/2013



References: 1. SFWMD, 2007a

Legend

 Structures	Flow Depth (ft)	 1.1 - 1.2	 1.9 - 2.0	 3.6 - 4.0
	 0.6	 1.3 - 1.4	 2.1 - 2.5	 4.1 - 5.0
	 0.7 - 0.8	 1.5 - 1.6	 2.6 - 3.0	 5.1 - 6.0
	 0.9 - 1.0	 1.7 - 1.8	 3.1 - 3.5	 6.1 - 7.0

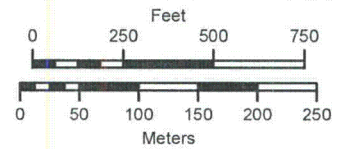
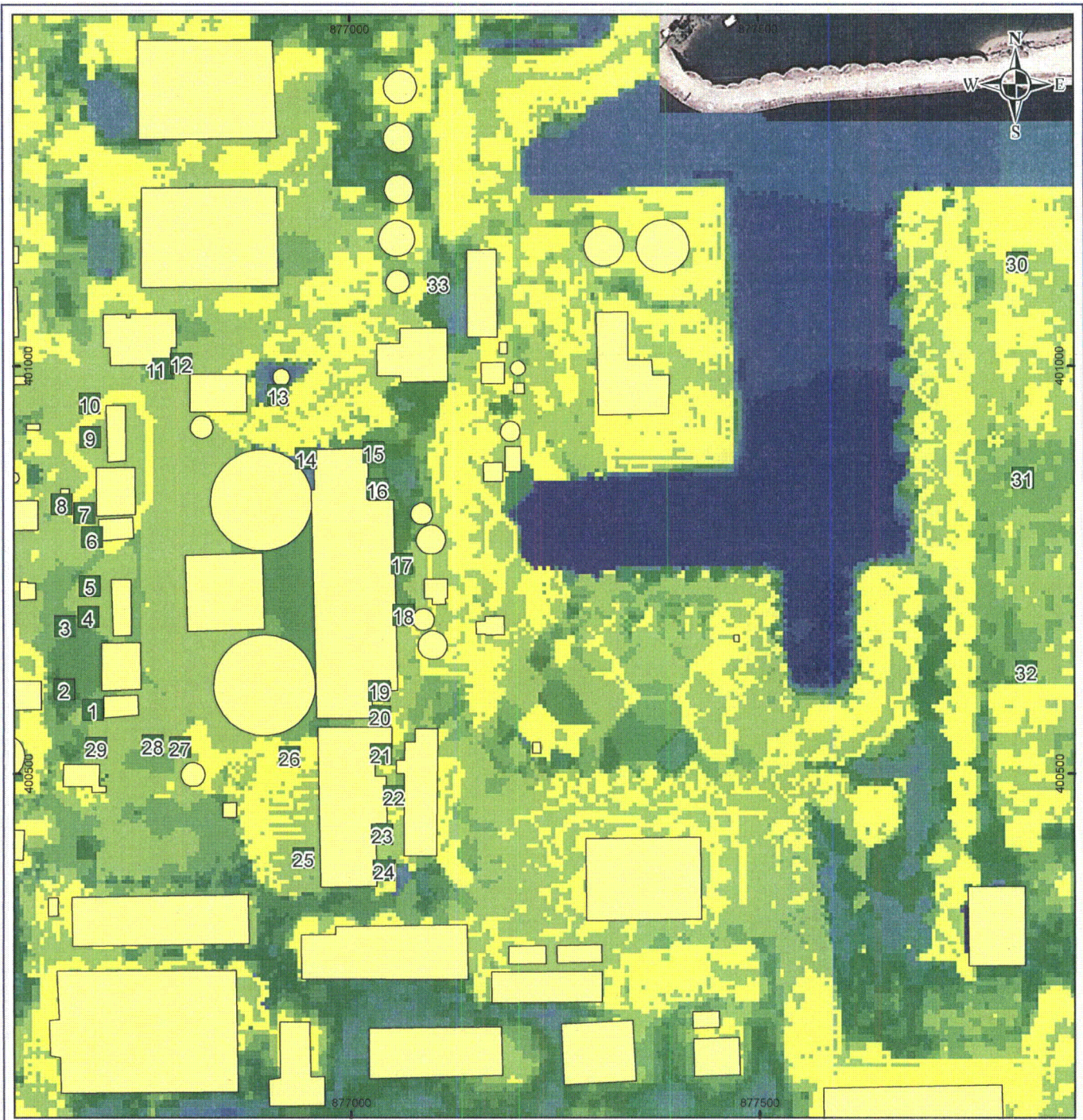


Figure 4-6


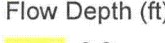

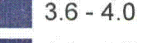


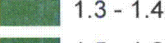

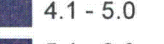

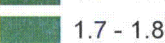

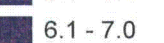




**Maximum Flow Depth (ft)
 Flooding Hazard Reevaluation
 Turkey Point Nuclear Generating Station Units 3&4 (PTN)**

Document Name: FPLTP077-GIS-A012
 Projection: State Plane Florida East, NAD 83 (US Feet)
 By: MLS Date: 01/06/2013



References: 1. SFWMD, 2007a.

Legend

 Points of Interest	Flow Depth (ft)	 1.1 - 1.2	 1.9 - 2.0	 3.6 - 4.0
 Structures	 0.6	 1.3 - 1.4	 2.1 - 2.5	 4.1 - 5.0
	 0.7 - 0.8	 1.5 - 1.6	 2.6 - 3.0	 5.1 - 6.0
	 0.9 - 1.0	 1.7 - 1.8	 3.1 - 3.5	 6.1 - 7.0

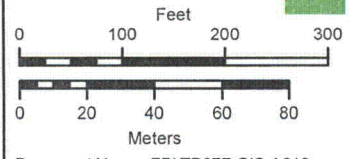


Figure 4-7

Points of Interest Overlaid with the Maximum Flow Depth (ft)
Flooding Hazard Reevaluation
Turkey Point Nuclear Generating Station Units 3&4 (PTN)

Document Name: FPLTP077-GIS-A013
 Projection: Station Plane Florida East, NAD 82 (US Feet)
 By: MLS Date: 01/06/2013



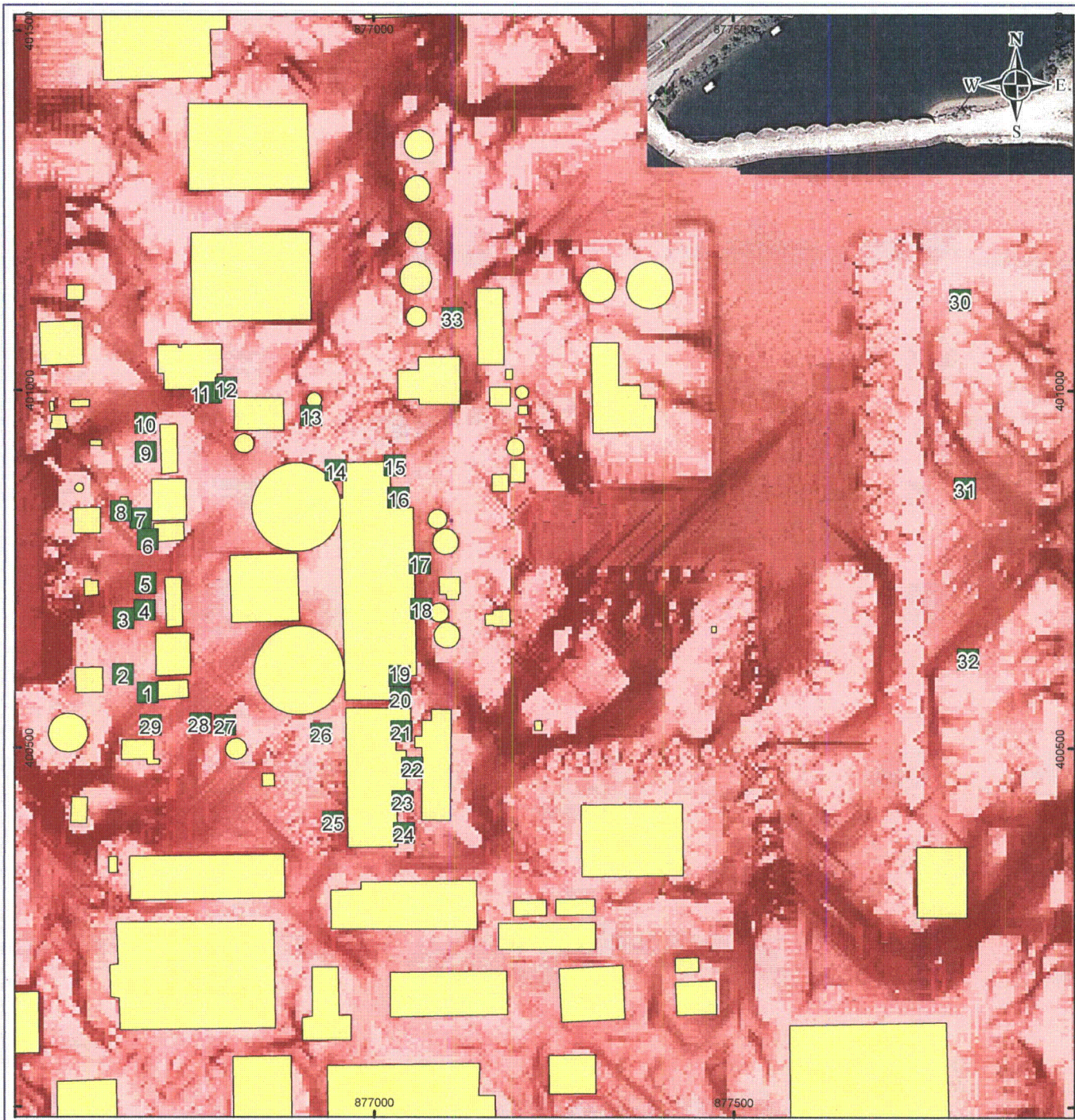
Figure 4-8

Reference: FPL, 2010.

Points of Interest Overlaid with Main Plant Site Drawing


















Document Name: FPL062-GIS-A015
By: MLS Date: 2/8/2013

Flooding Hazard Reevaluation
Turkey Point Nuclear Generating Station Units 3&4 (PTN)



References: 1. SFWMD, 2007a

Legend

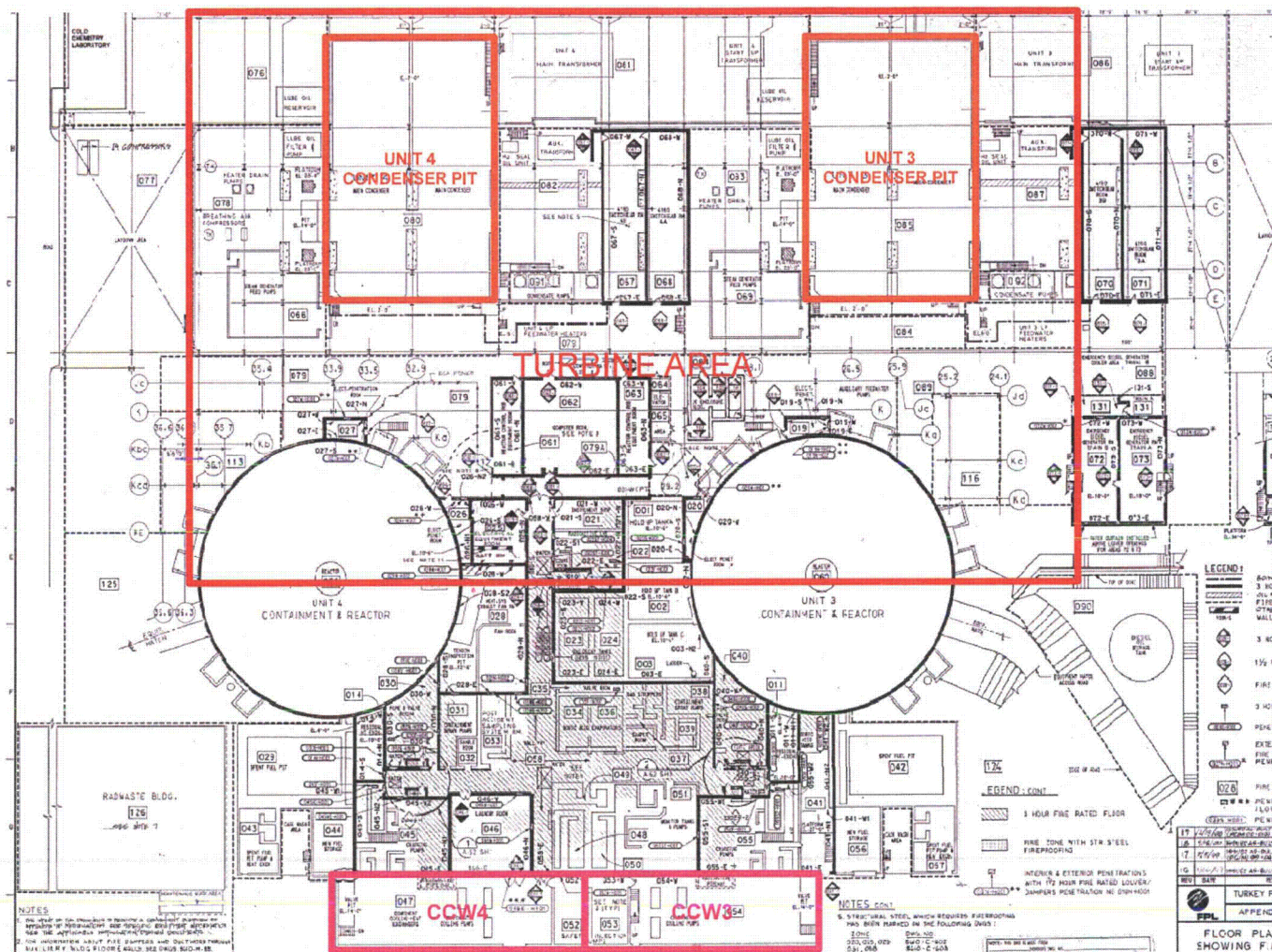
	Points of Interest	Velocity (ft/s)		0.601 - 0.800		1.501 - 1.750		3.001 - 3.500	
	Structures		0.000 - 0.200		0.801 - 1.000		1.751 - 2.000		3.501 - 4.500
			0.201 - 0.400		1.001 - 1.250		2.001 - 2.500		4.501 - 6.000
			0.401 - 0.600		1.251 - 1.500		2.501 - 3.000		6.001 - 7.460

0 100 200 300
Feet

0 24 48 72 96
Meters

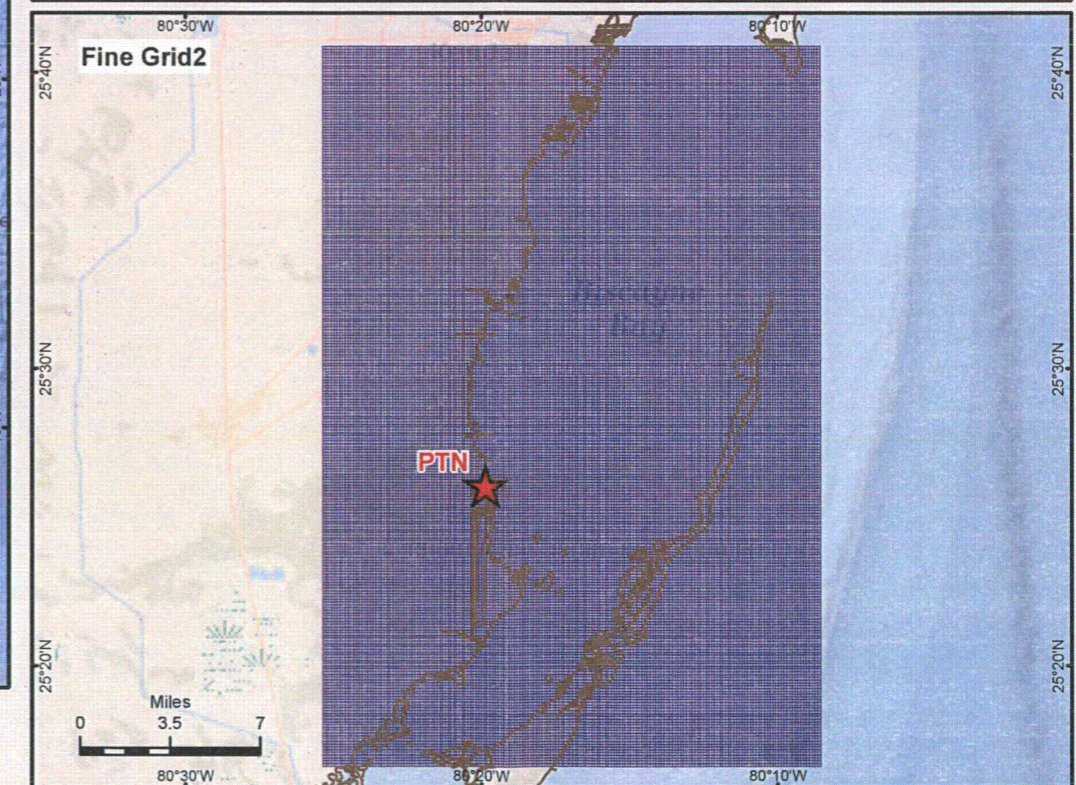
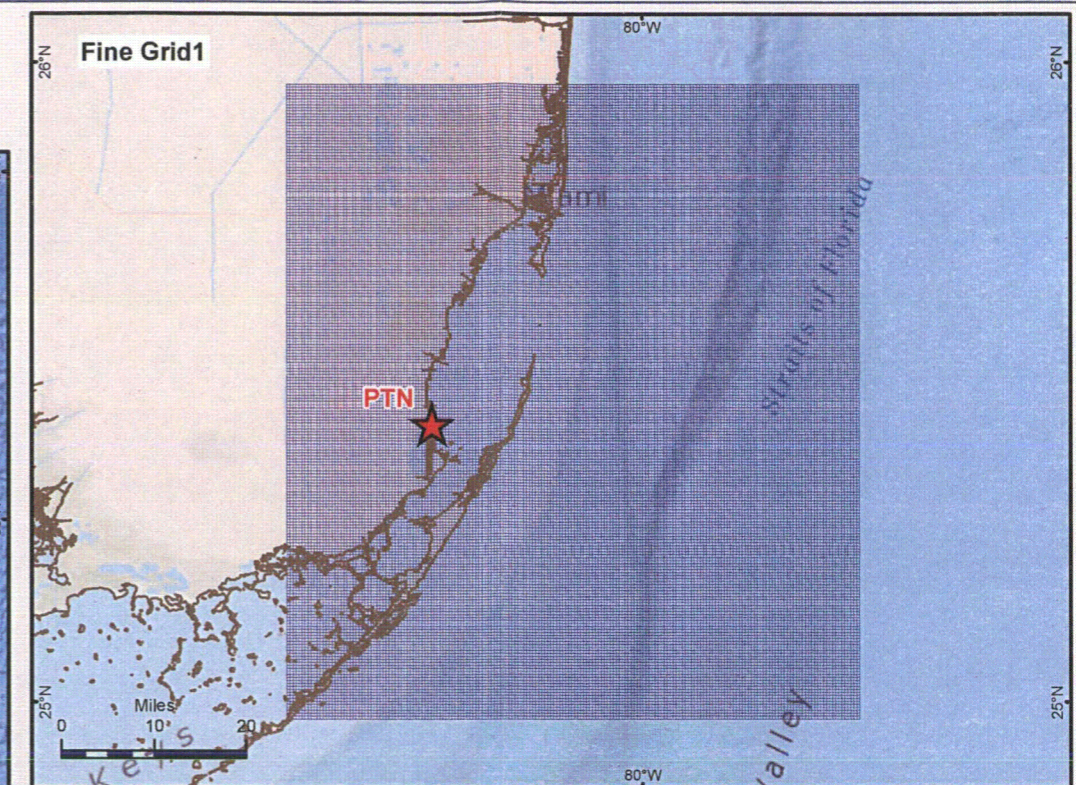
Figure 4-9
Points of Interest Overlaid with the Peak Flow Velocity (ft/s)
Flooding Hazard Reevaluation
Turkey Point Nuclear Generating Station Units 3&4 (PTN)

Document Name: FPLTP077-GIS-A027
Projection: Station Plane Florida East, NAD 82 (US Feet)
By: MLS Date: 01/06/2013

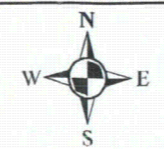




References: ESRI, 2013a

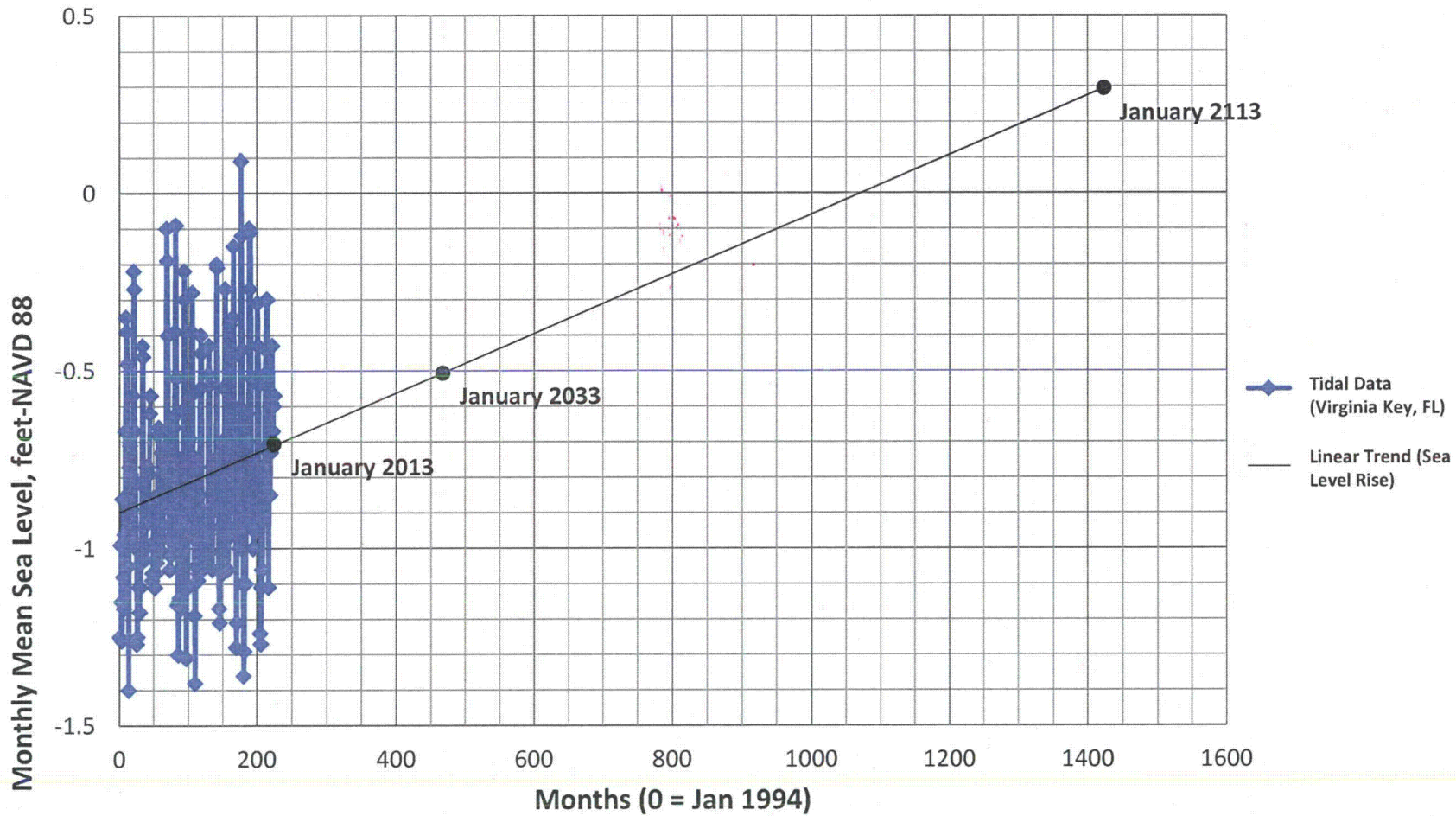


- Legend**
- ★ Turkey Point Nuclear Generating Station Units 3 & 4 (PTN)
 - Shoreline
 - DELFT3D Grid Model Domain



Document Name: FPLTP077-GIS-B001
 Projection: Geographic Coordinate System, WGS 84
 By: MLS Date: 01/06/2013

Figure 4-11
DELFT3D Grid Model Domain
Flooding Hazard Reevaluation
Turkey Point Nuclear Generating Station 3&4 (PTN)

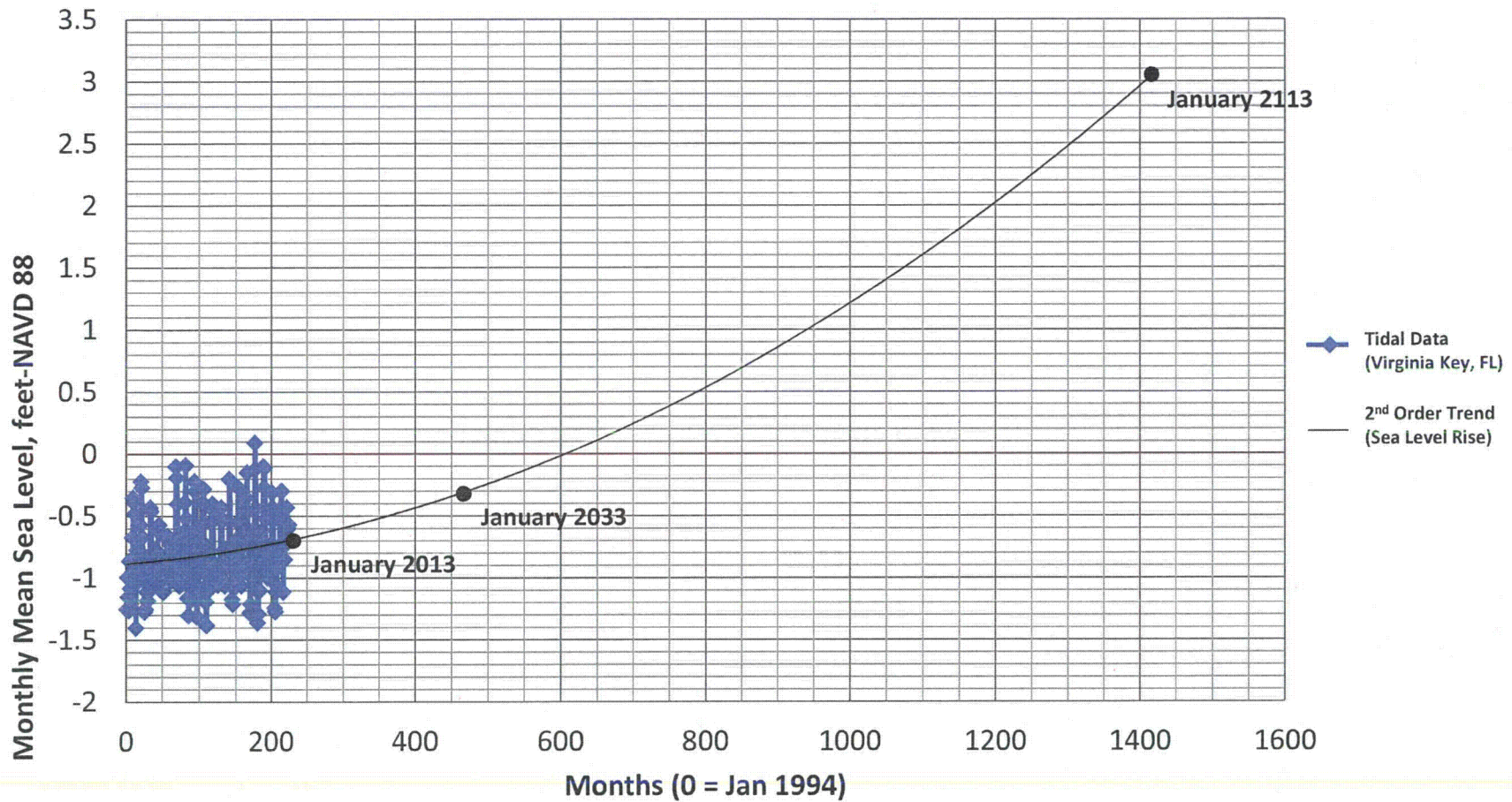


References: NOAA, 2012e.

Figure 4-12

Sea Level Rise - Linear Trend

Flooding Hazard Reevaluation
 Turkey Point Nuclear Generating Station Units 3&4 (PTN)

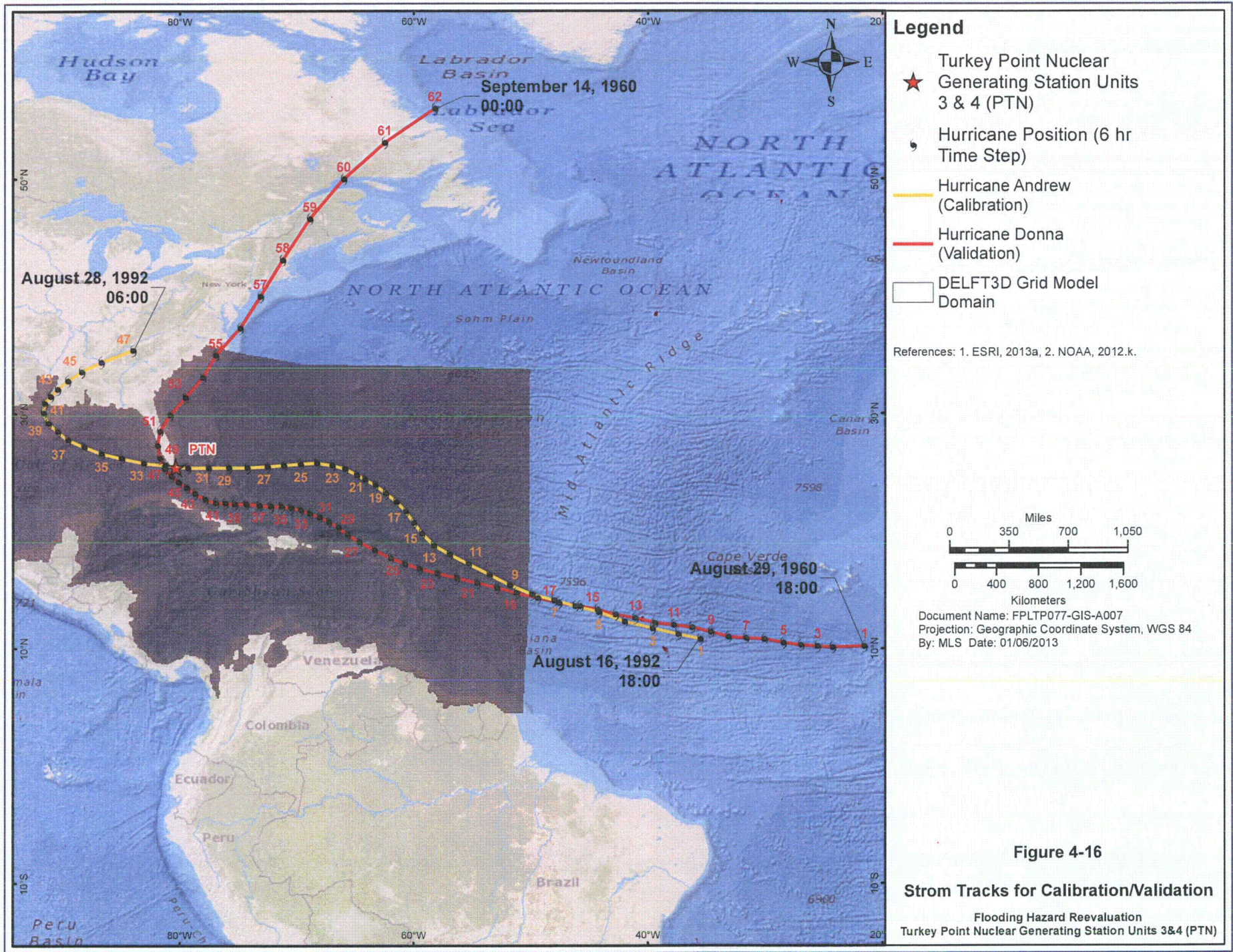


References: NOAA, 2012e.

Figure 4-13

Sea Level Rise – 2nd Order Trend

Flooding Hazard Reevaluation
 Turkey Point Nuclear Generating Station Units 3&4 (PTN)



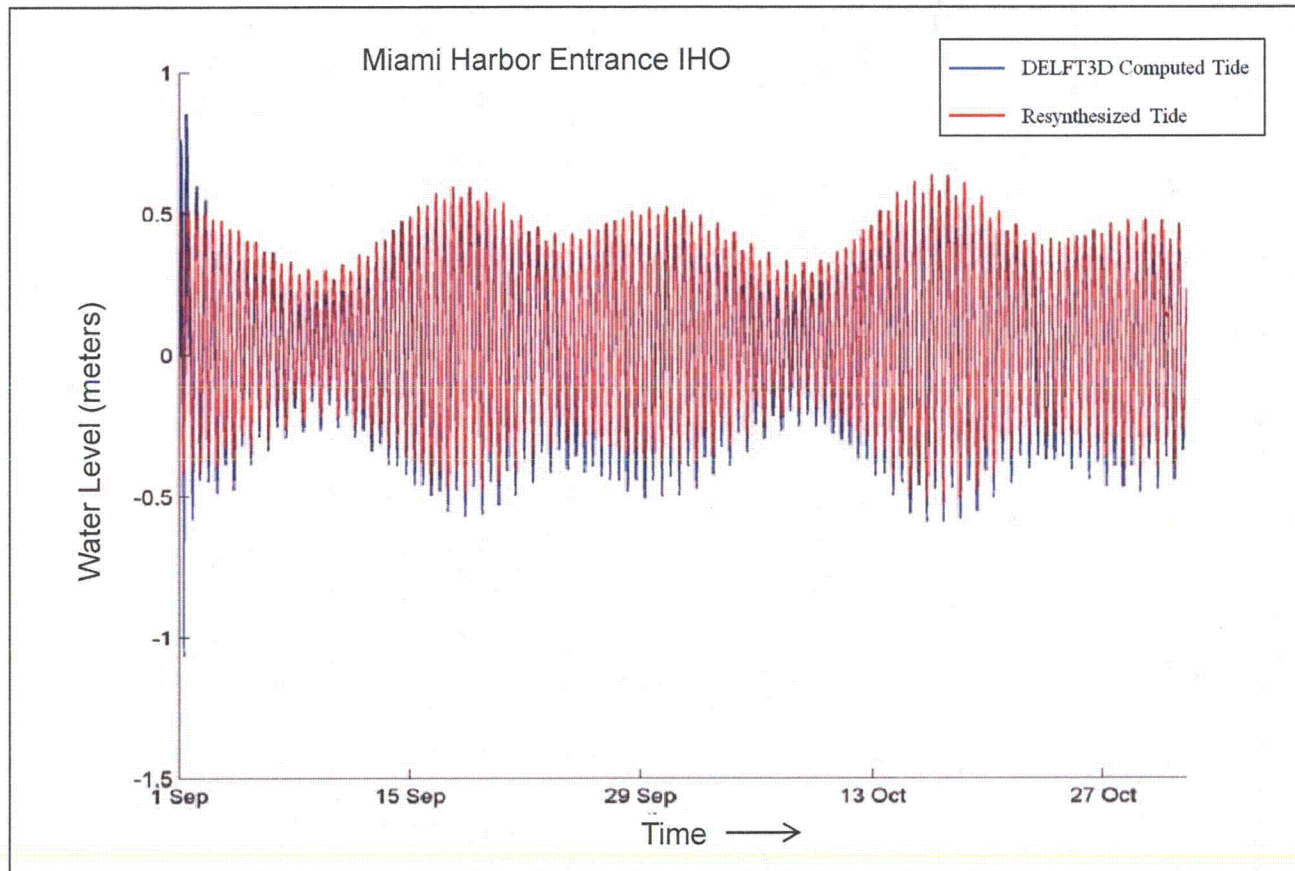
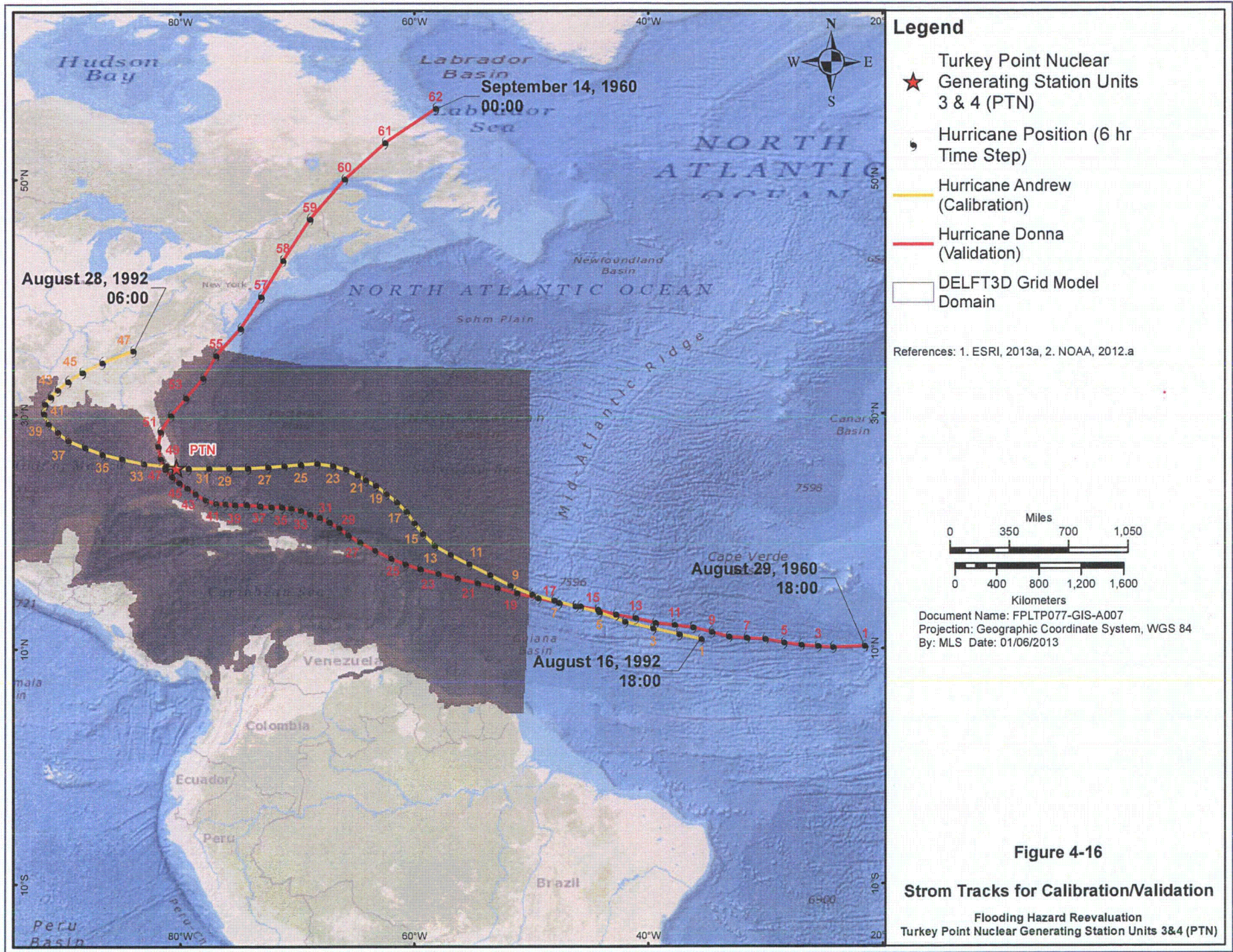


Figure 4-15

Tidal Station Calibration Results at
IHO Station Miami Harbor Entrance, Florida

Flooding Hazard Reevaluation
Turkey Point Nuclear Generating Station Units 3&4 (PTN)

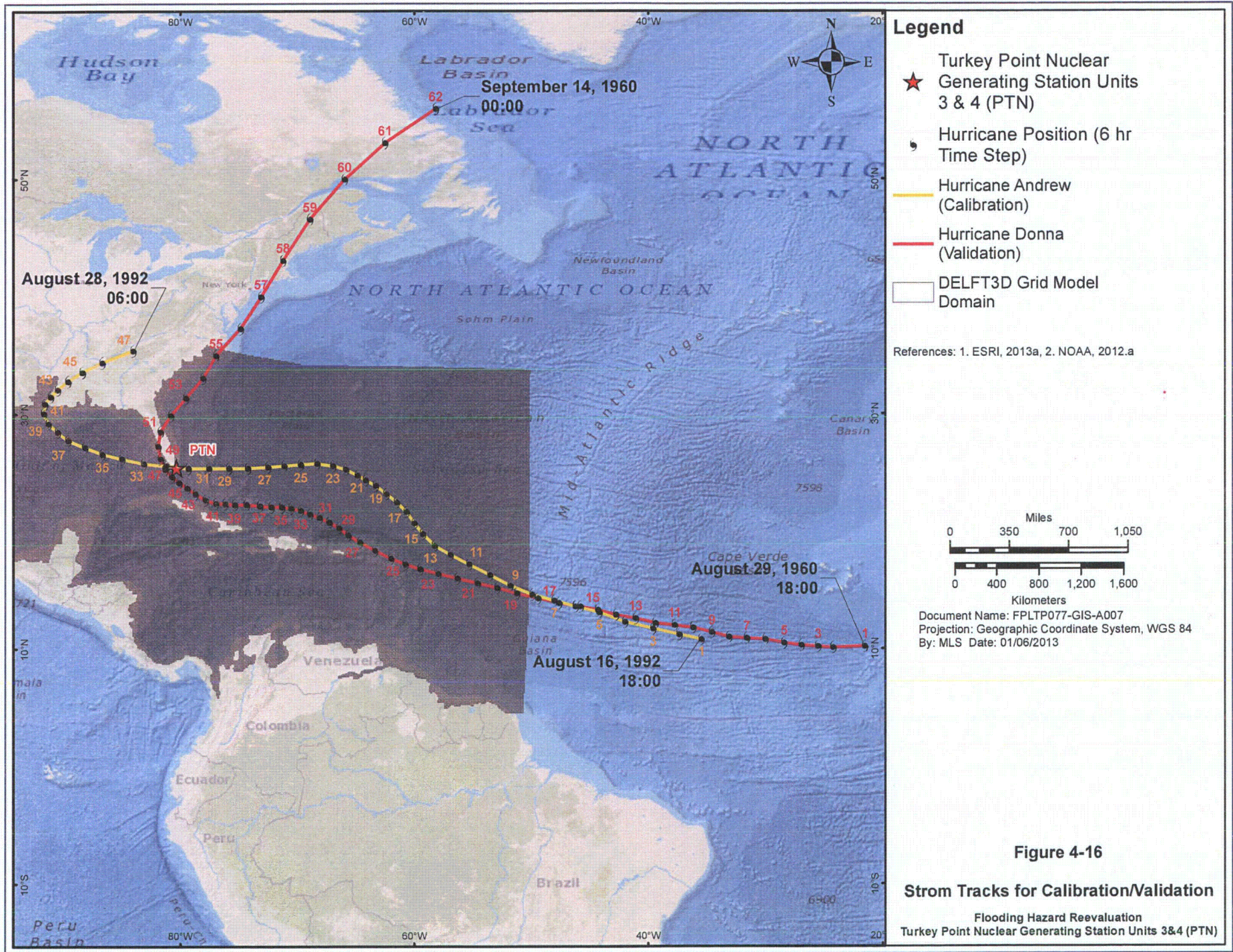


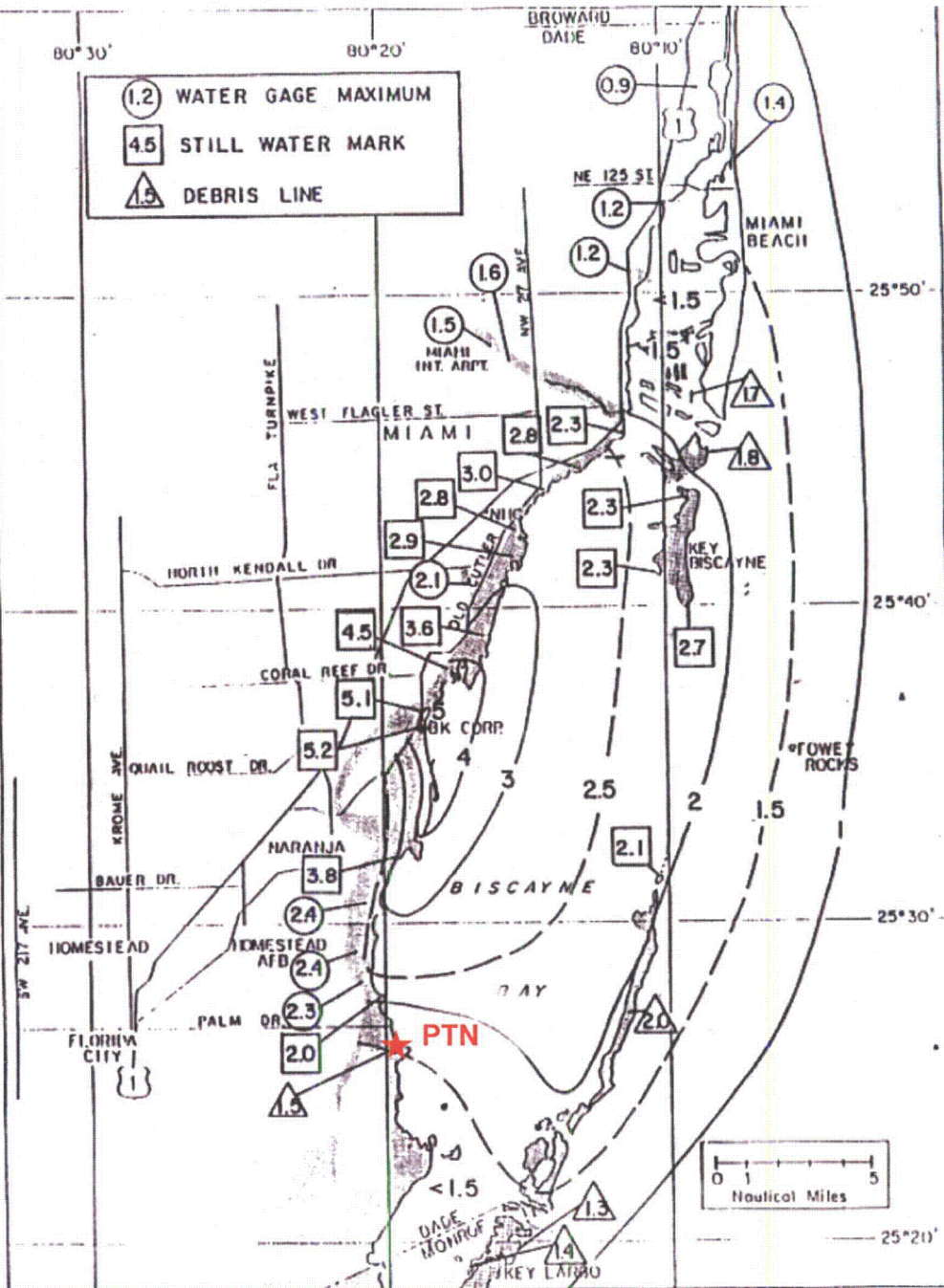
August 28, 1992
06:00

September 14, 1960
00:00

Cape Verde
August 29, 1960
18:00

August 16, 1992
18:00





Reference: NOAA, 2012n.

Note: Reported values are in meters NGVD 29 datum.

Figure 4-17

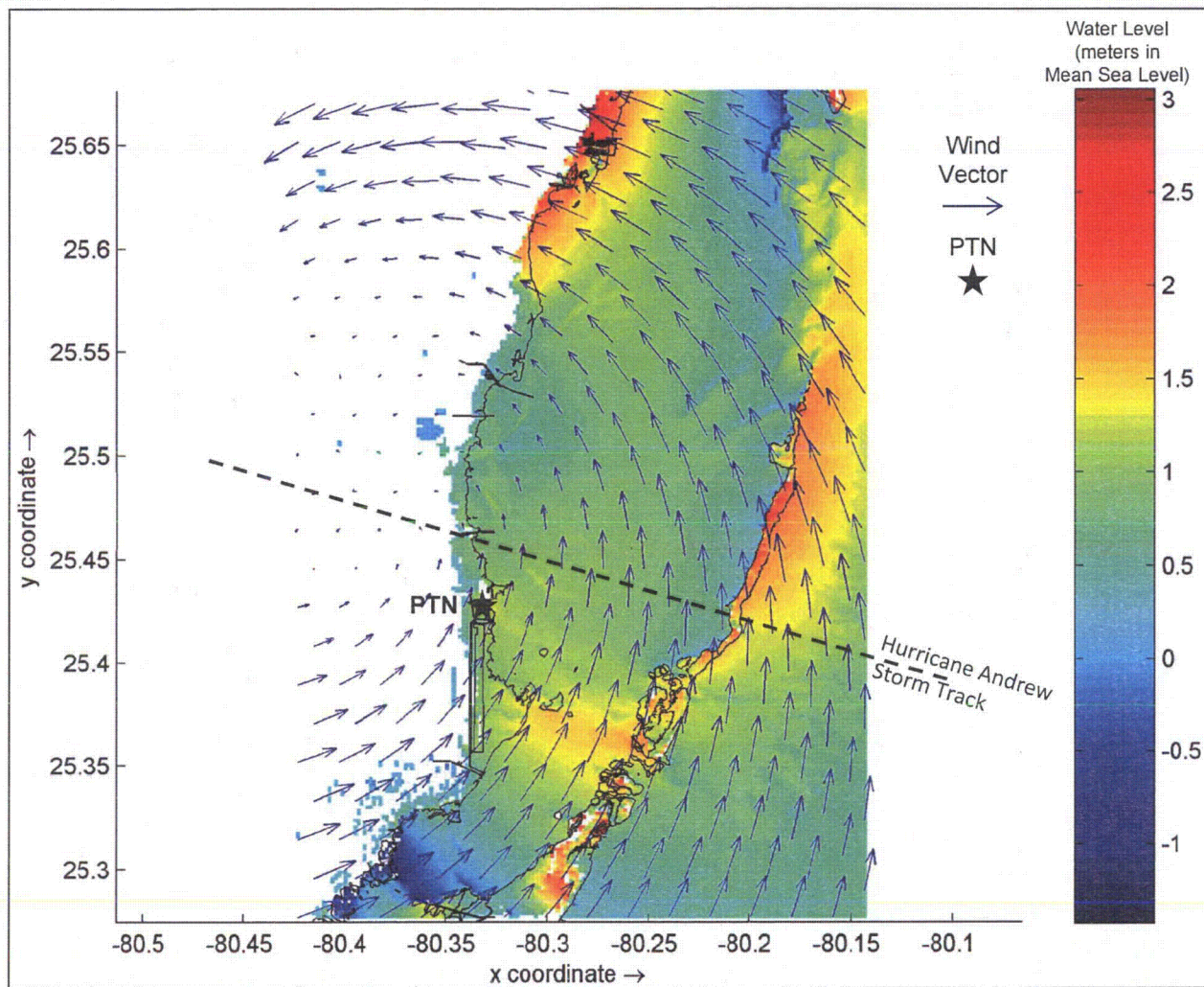
Legend:

★ Turkey Point Nuclear Generating Station Units 3&4 (PTN)

Observed Storm Surge Water Levels for Hurricane Andrew

Document Name: FPL062-GIS-A015
By: MLS Date: 2/8/2013

**Flooding Hazard Reevaluation
Turkey Point Nuclear Generating Station Units 3&4 (PTN)**

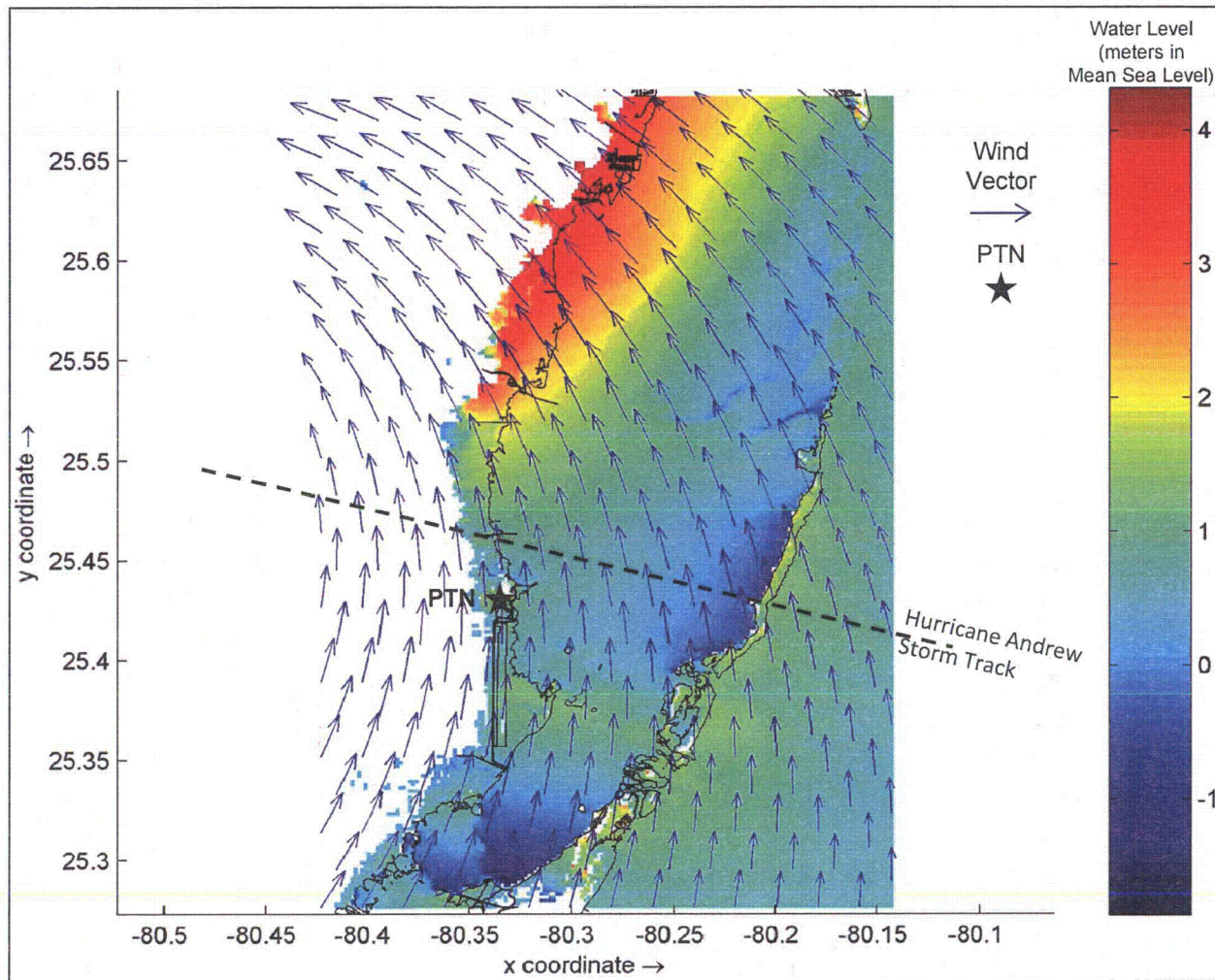


Time Step 1 (Output Time Step 368 [August 24, 1992 @ 09:30:00])

Figure 4-18

DELFT3D Computed Hurricane Andrew Storm Surge
at Time Step 1 in the Fine Grid 2 Model Domain

Flooding Hazard Reevaluation
Turkey Point Nuclear Generating Station Units 3&4 (PTN)

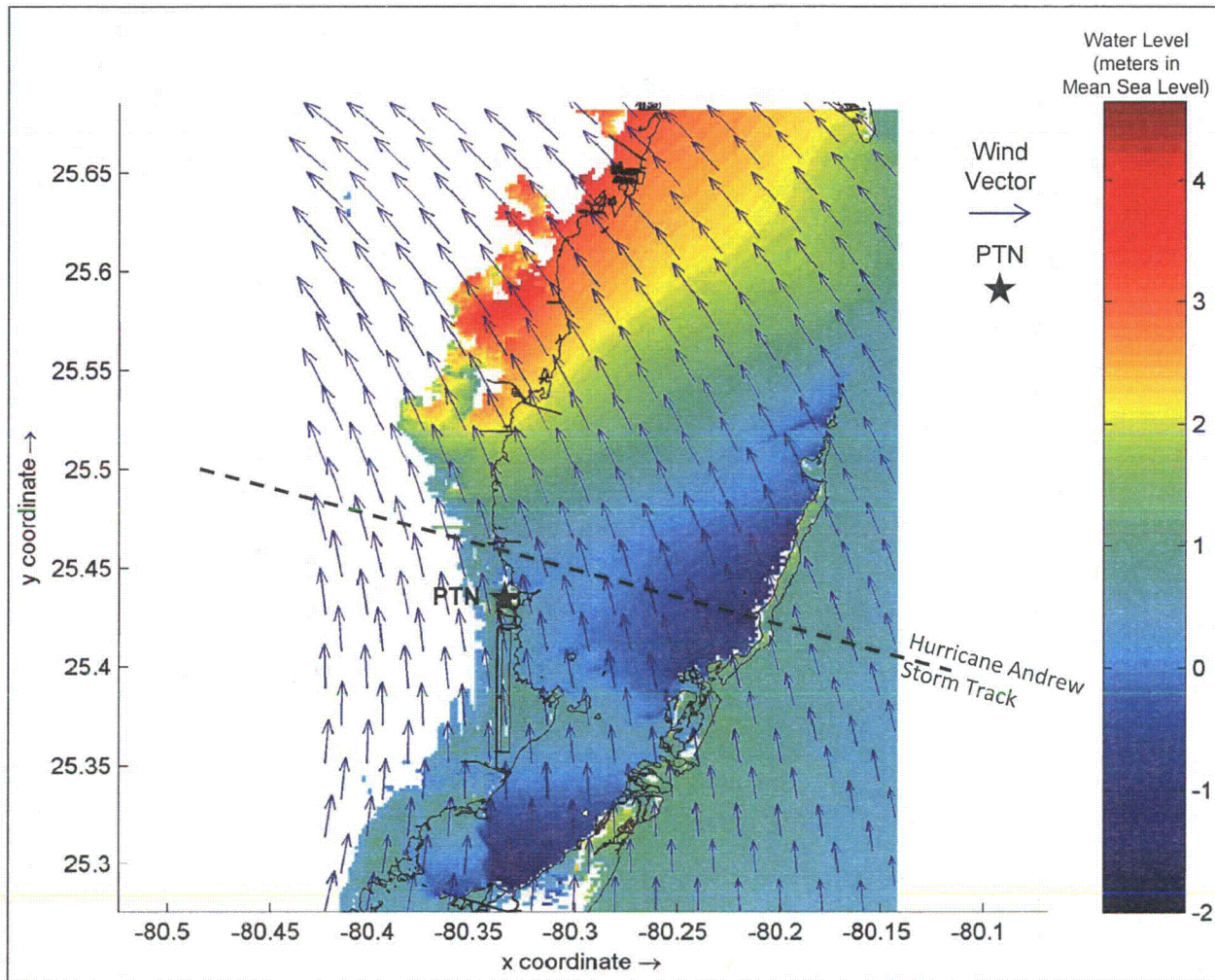


Time Step 2 (Output Time Step 369 [August 24, 1992 @ 10:00:00])

Figure 4-19

DELFT3D Computed Hurricane Andrew Storm Surge
at Time Step 2 in the Fine Grid 2 Model Domain

Flooding Hazard Reevaluation
Turkey Point Nuclear Generating Station Units 3&4 (PTN)

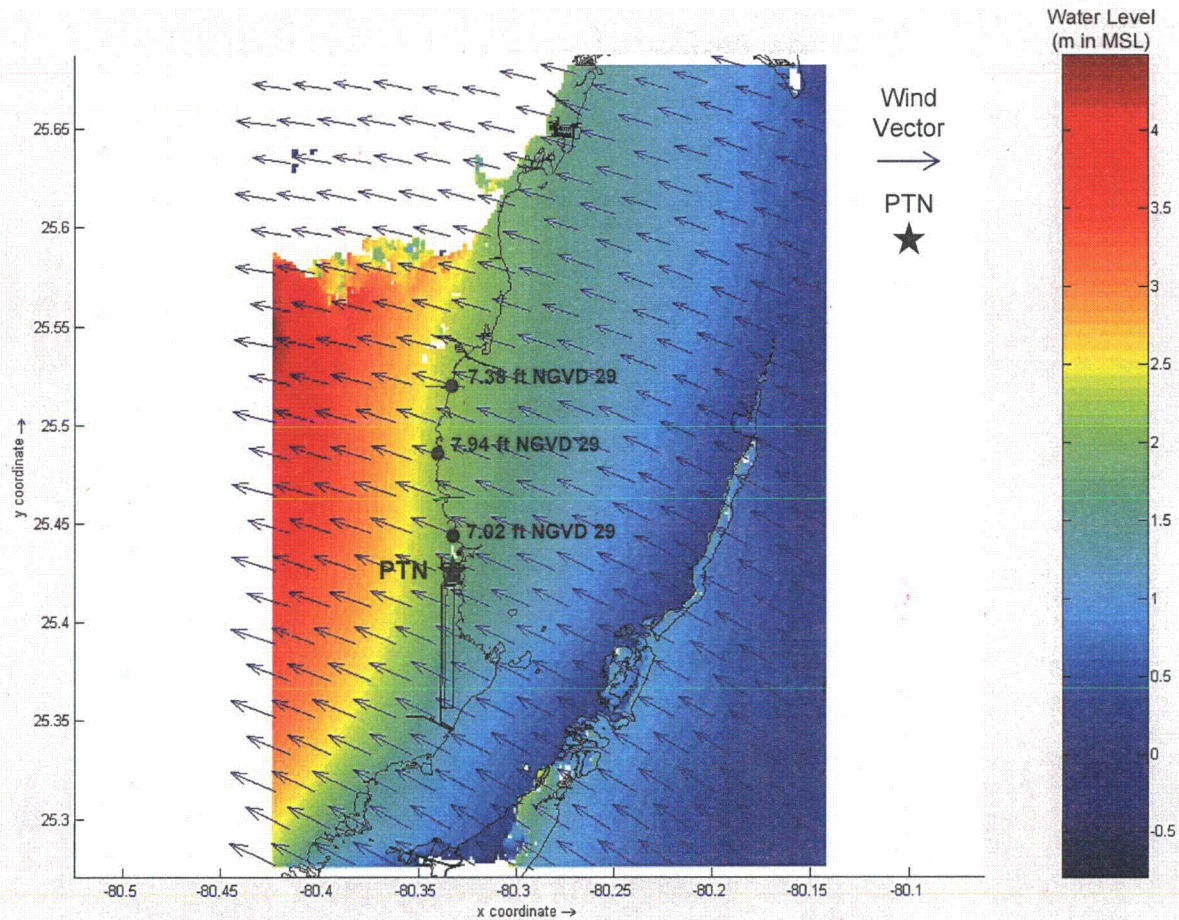


Time Step 3 (Output Time Step 370 [August 24, 1992 @ 10:30:00])

Figure 4-20

DELFT3D Computed Hurricane Andrew Storm Surge
at Time Step 3 in the Fine Grid 2 Model Domain

Flooding Hazard Reevaluation
Turkey Point Nuclear Generating Station Units 3&4 (PTN)

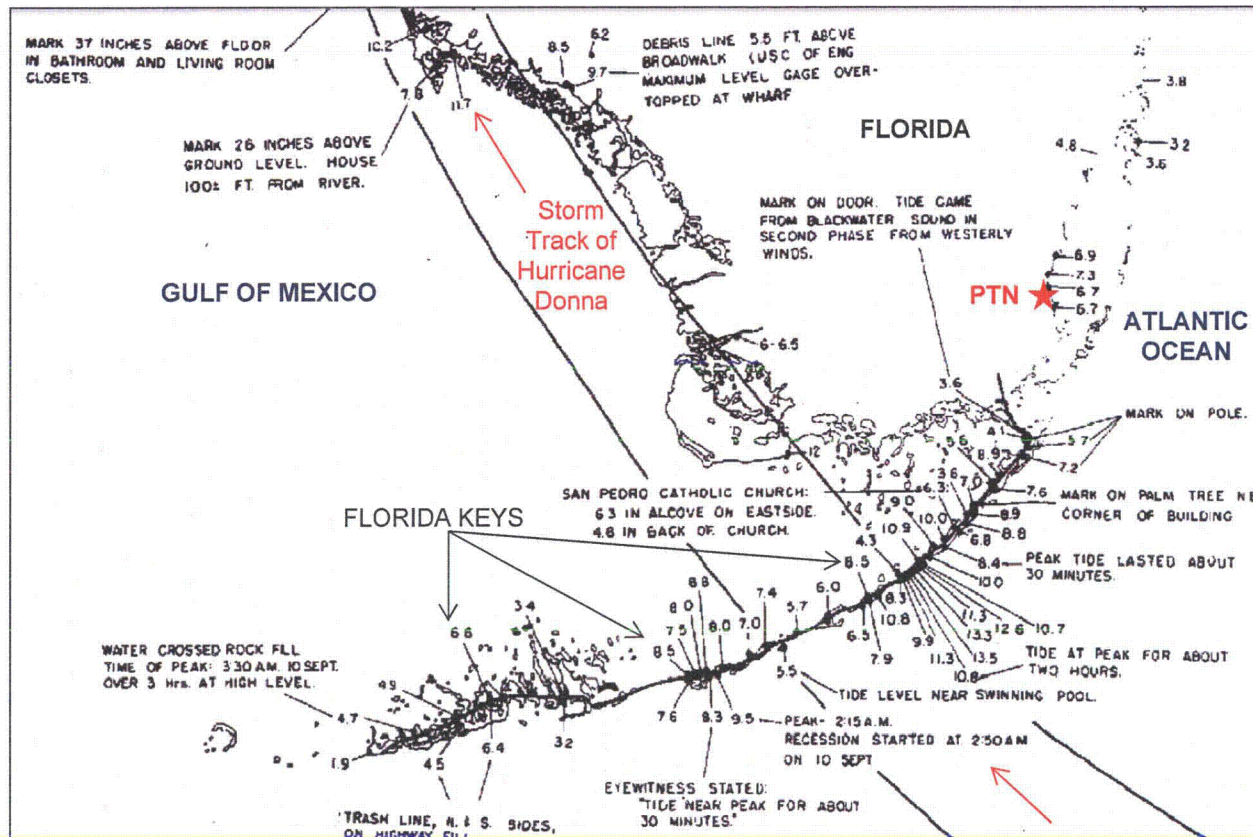


Time Step 1 (Output Time Step 8340 [September 10, 1960 @ 07:58:00])

Figure 4-21

DELFT3D Computed Hurricane Donna Storm Surge
at Time Step 1 in the Fine Grid 2 Model Domain

Flooding Hazard Reevaluation
Turkey Point Nuclear Generating Station Units 3&4 (PTN)



Reference: Harris, 1963.

Note: Reported values are in feet NGVD 29 datum.

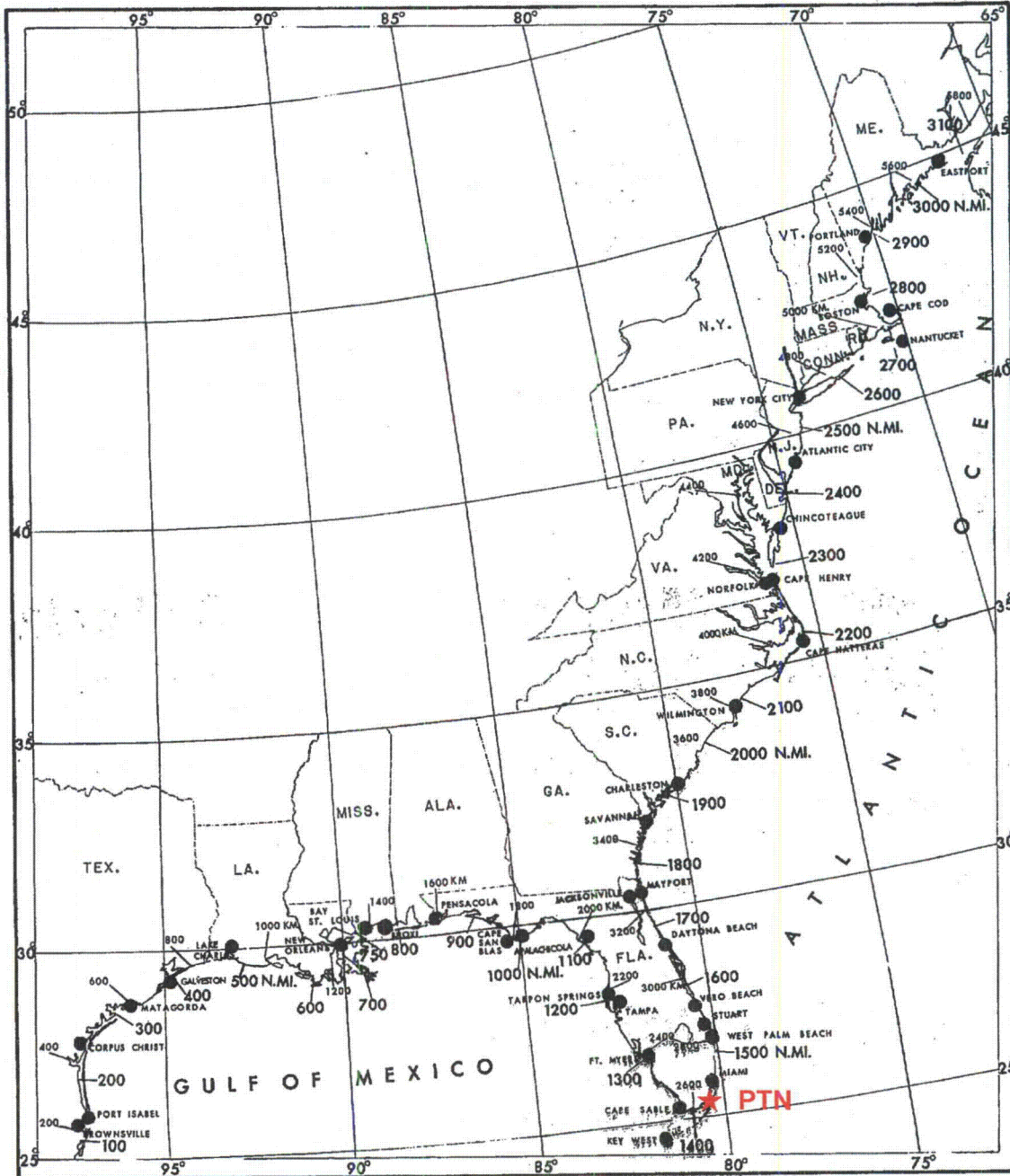
Legend

★ Turkey Point Nuclear Generating Station Units 3&4 (PTN)

Figure 4-22

Observed Storm Surge Water Levels for Hurricane Donna

Flooding Hazard Reevaluation
Turkey Point Nuclear Generating Station Units 3&4 (PTN)



Reference: NWS, 1979.

Legend:

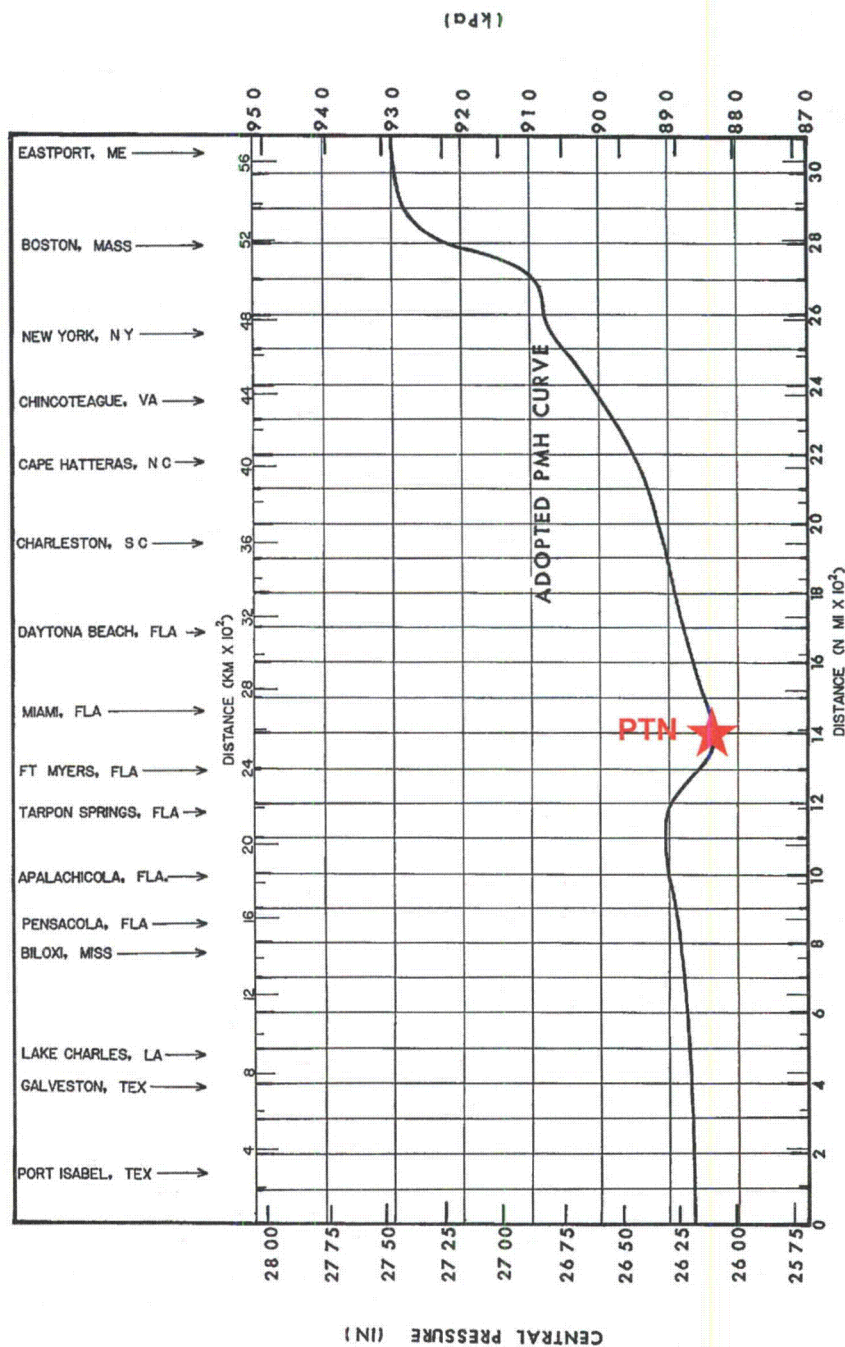
- ★ Turkey Point Nuclear Generating Station Units 3&4 (PTN)

Document Name: FPL062-GIS-A015
 By: MLS Date: 2/8/2013

Figure 4-23

Coastal Distance Intervals in Nautical Miles and Kilometers

**Flooding Hazard Reevaluation
 Turkey Point Nuclear Generating Station Units 3&4 (PTN)**



Reference: NWS, 1979.

Legend:

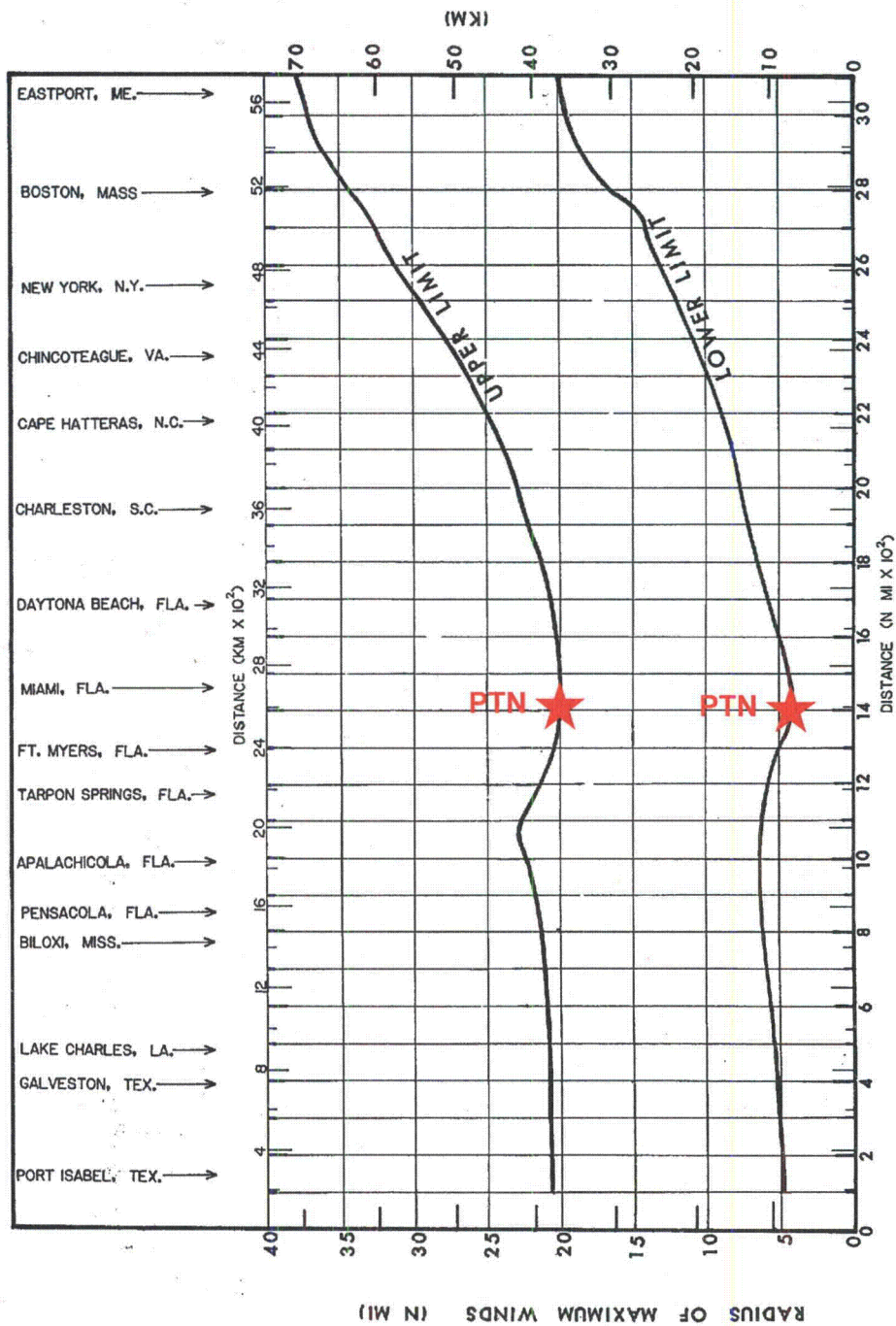
- ★ Turkey Point Nuclear Generating Station Units 3&4 (PTN)

Document Name: FPL062-GIS-A015
 By: MLS Date: 2/8/2013

Figure 4-24

Central Pressure for the
 Probable Maximum Hurricane (PMH)

Flooding Hazard Reevaluation
 Turkey Point Nuclear Generating Station Units 3&4 (PTN)



Reference: NWS, 1979.

Legend:

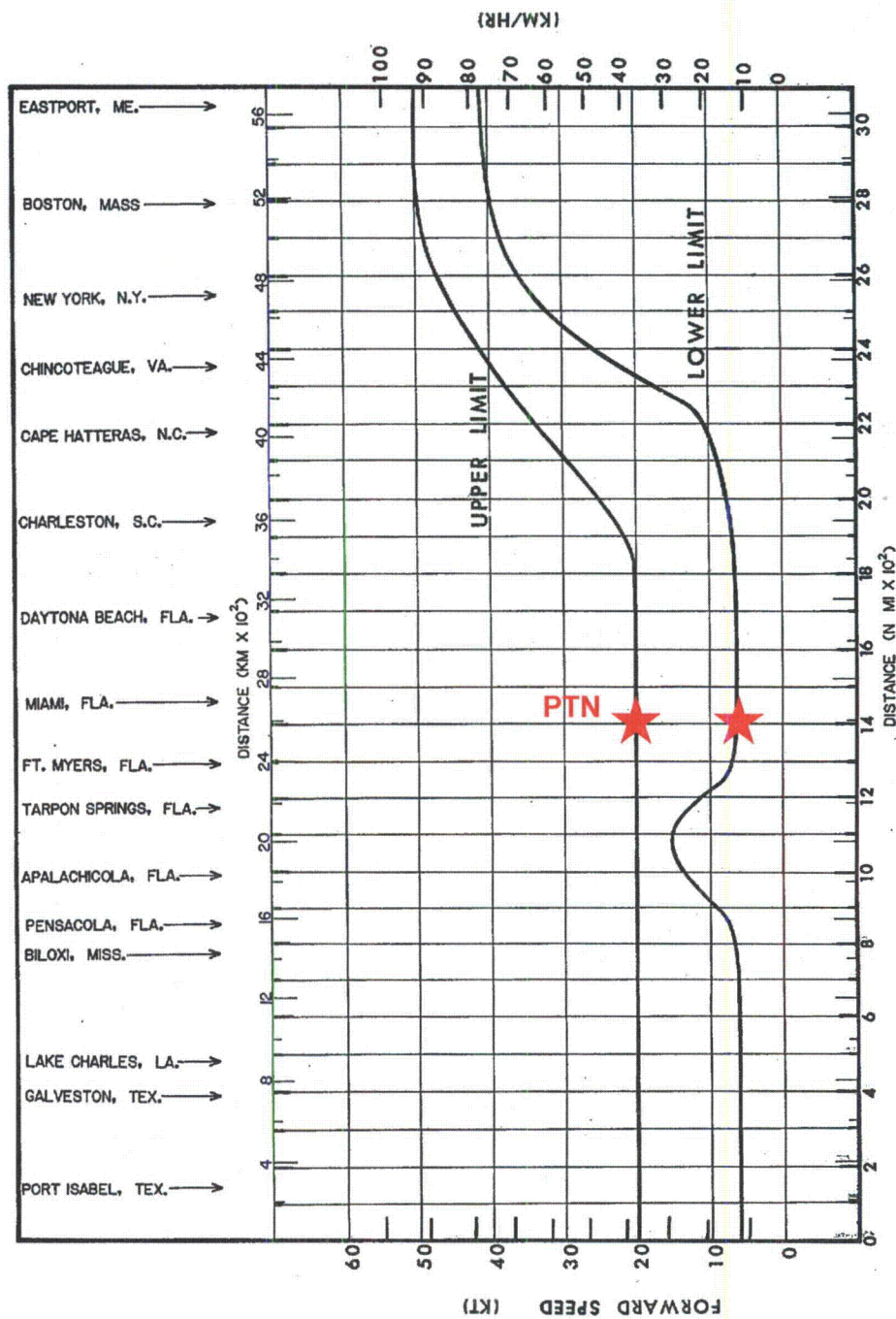
★ Turkey Point Nuclear Generating Station Units 3&4 (PTN)

Document Name: FPL062-GIS-A015
By: MLS Date: 2/8/2013

Figure 4-25

Adopted Upper and Lower Limits of Radius of Maximum Winds for the Probable Maximum Hurricane (PMH)

Flooding Hazard Reevaluation
Turkey Point Nuclear Generating Station Units 3&4 (PTN)



Reference: NWS, 1979.

Legend:

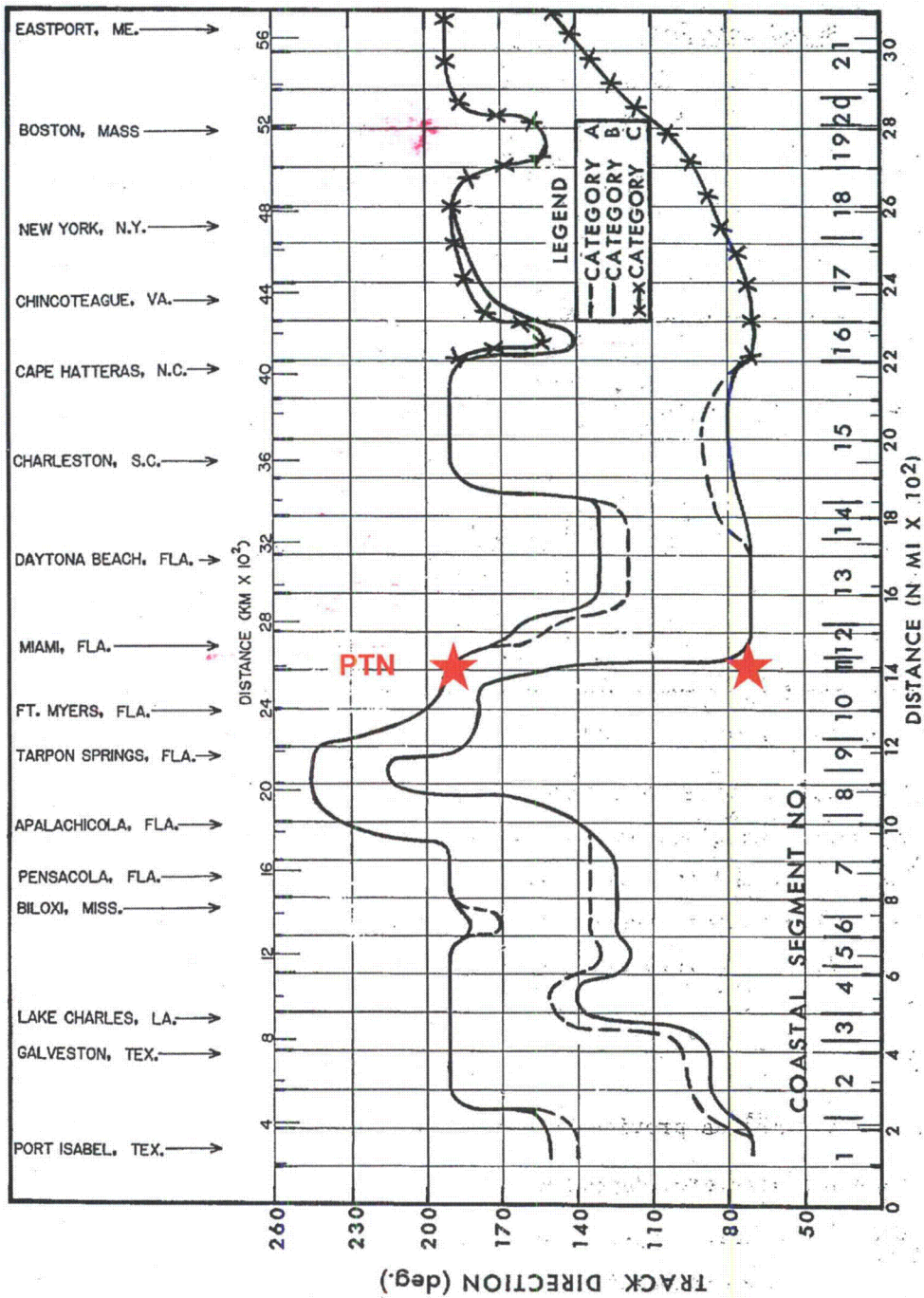
- ★ Turkey Point Nuclear Generating Station Units 3&4 (PTN)

Document Name: FPL062-GIS-A015
 By: MLS Date: 2/8/2013

Figure 4-26

**Adopted Probable Maximum Hurricane (PMH)
 Upper and Lower Limits of Forward Speed**

**Flooding Hazard Reevaluation
 Turkey Point Nuclear Generating Station Units 3&4 (PTN)**



Reference: NWS, 1979.

Legend:

- ★ Turkey Point Nuclear Generating Station Units 3&4 (PTN)

Document Name: FPL062-GIS-A015
 By: MLS Date: 2/8/2013

Figure 4-27

Maximum Allowable Range of the Probable Maximum Hurricane Track Direction

**Flooding Hazard Reevaluation
 Turkey Point Nuclear Generating Station Units 3&4 (PTN)**



References: 1. ESRI, 2012, 2. NOAA, 2013.

Legend

- ★ Turkey Point Nuclear Generating Station Units 3&4 (PTN)
- > Hurricane Storm Classification (Saffir-Simpson Hurricane Scale) Category 4
- > Hurricane Storm Classification (Saffir-Simpson Hurricane Scale) Category 5

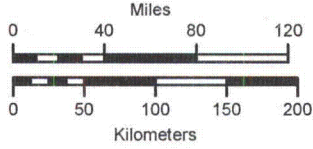
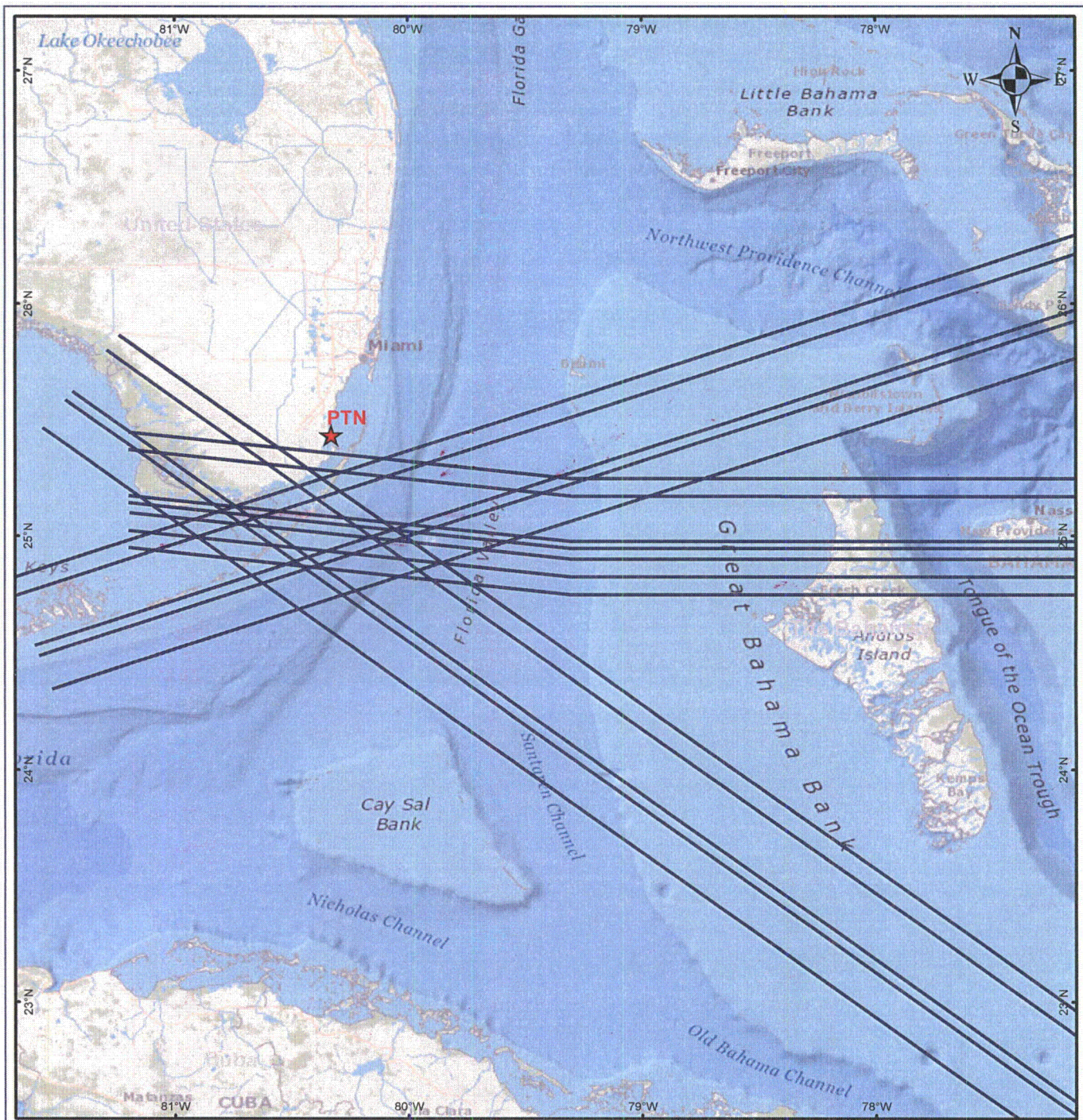


Figure 4-28
Tracks of Historical Hurricanes
(Intensities of Category 4 & 5 in the
Region of PTN
Flooding Hazard Reevaluation
Turkey Point Nuclear Generating Station Units 3&4 (PTN)

Document Name: FPLTP077-GIS-A016
 Projection: Geographic Coordinate System, WGS 84
 By: MLS Date: 01/06/2013

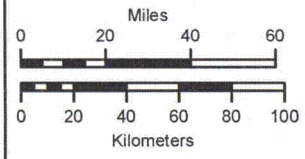


References: 1. ESRI, 2012, 2. NOAA, 2013.

Legend

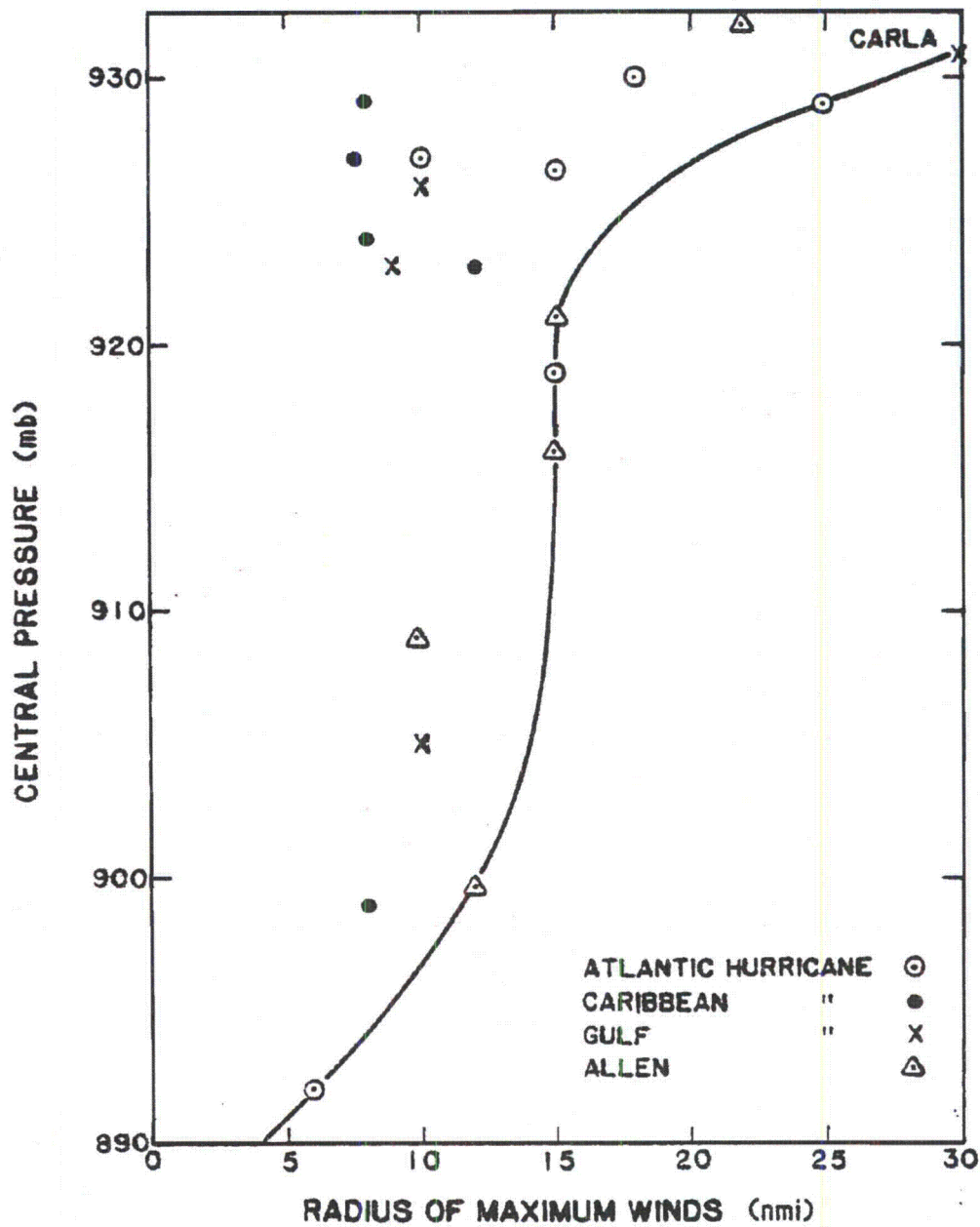
★ Turkey Point Nuclear Generating Station Units 3&4 (PTN)

— Synthetic Storm Tracks for Probable Maximum Storm Surge Analyses



Document Name: FPLTP077-GIS-A017
 Projection: Geographic Coordinate System, WGS 84
 By: MLS Date: 01/06/2013

Figure 4-29
Synthetic Storm Tracks
Flooding Hazard Reevaluation
Turkey Point Nuclear Generating Station Units 3&4 (PTN)



Reference: NWS, 1987.

Figure 4-30

Plot Central Pressure (P_0) Versus
Radius of Maximum Winds (R)
for Extreme Hurricanes

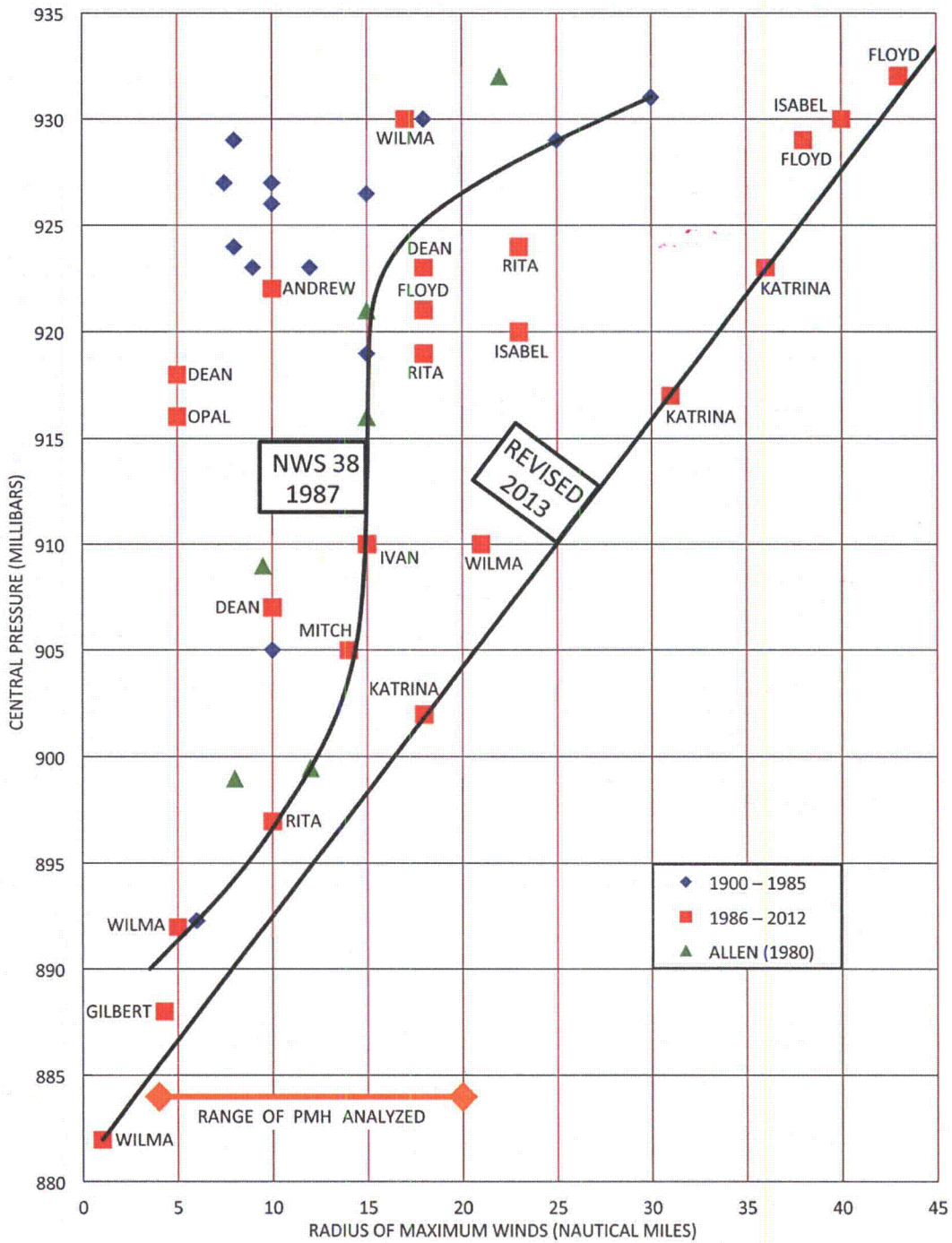


Figure 4-31

Plot Central Pressure (P_0) Versus
 Radius of Maximum Winds (R)
 for Extreme Hurricanes, Revised 2013

Reference:
 For storms through 1985 see NWS, 1979;
 For storms since 1985 see Table 4-15.

Document Name: FPL062-GIS-A015
 By: MLS Date: 3/8/2013

Flooding Hazard Reevaluation
 Turkey Point Nuclear Generating Station Units 3&4 (PTN)

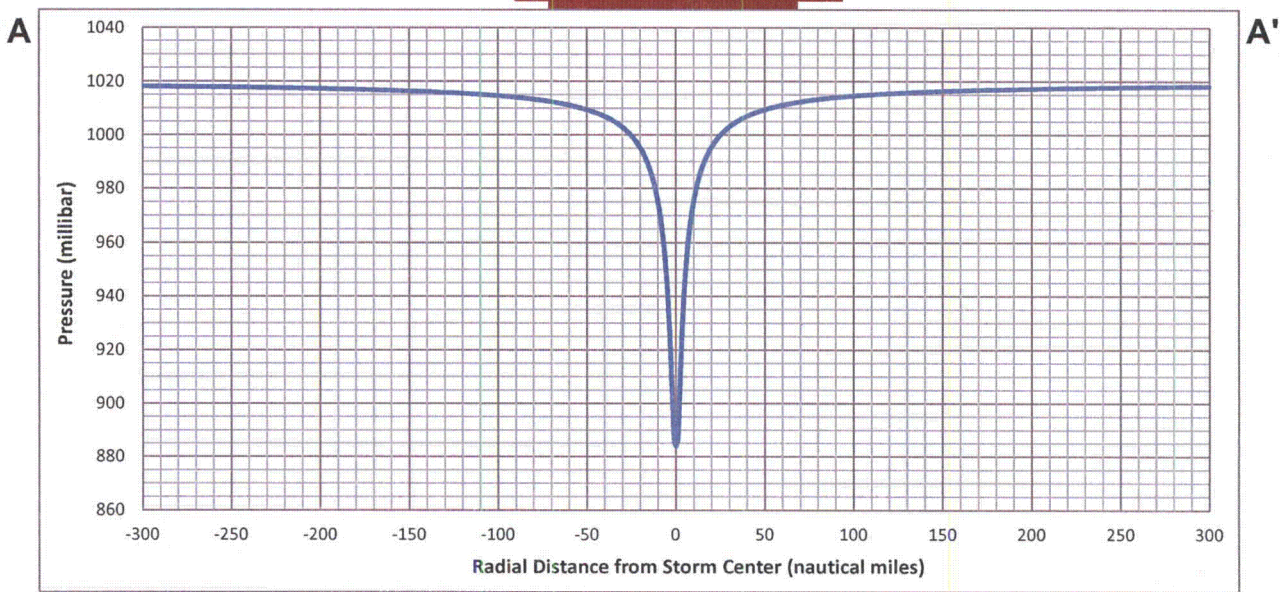
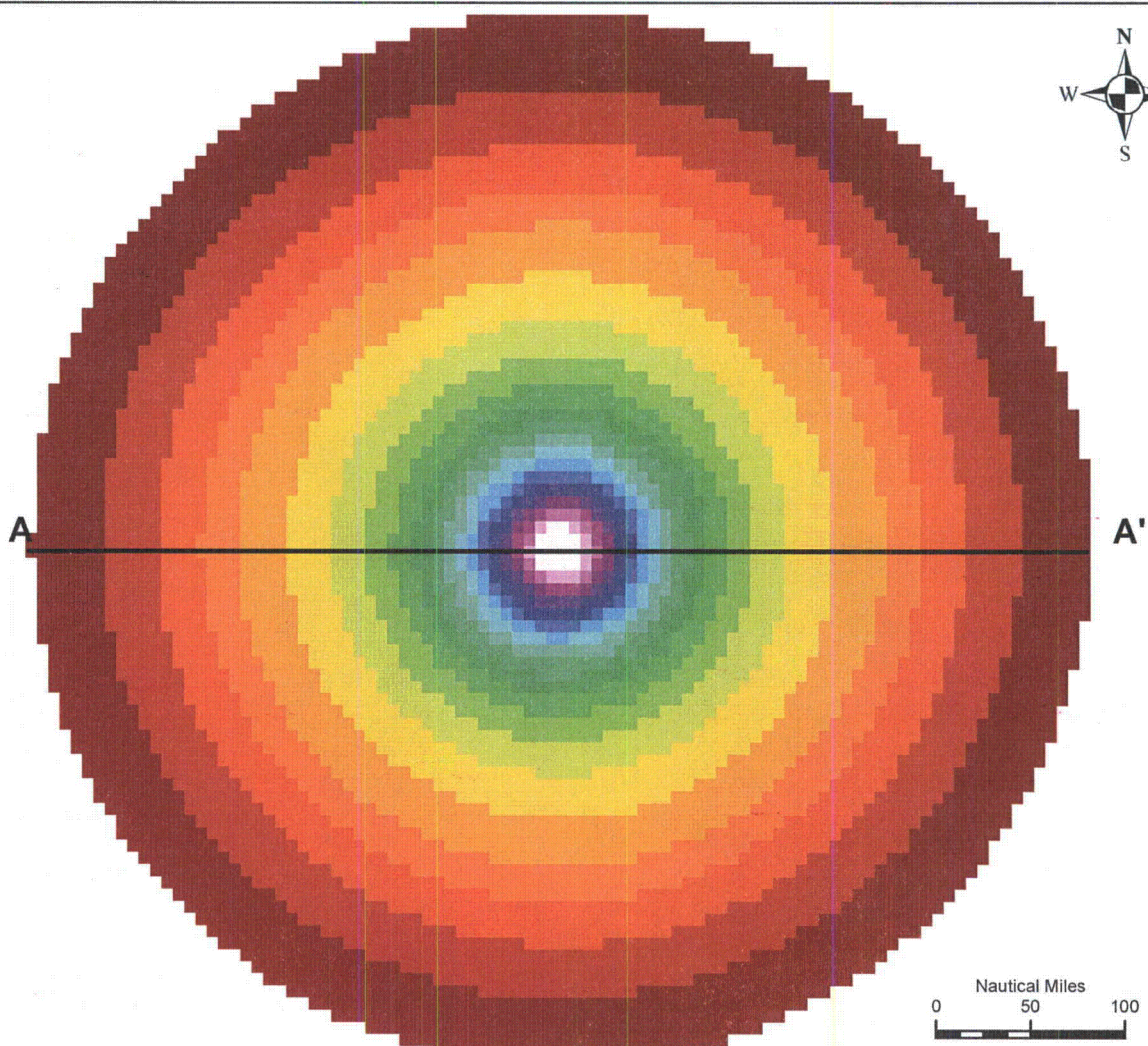


Figure 4-32

Document Name: FPLTP077-GIS-A026
 Projection: State Plane Florida East,
 NAD 83 (US Feet)
 By: MLS Date: 01/6/2013

Hurricane Pressure Field
Flooding Hazard Reevaluation
Turkey Point Nuclear Generating Station Units 3&4 (PTN)

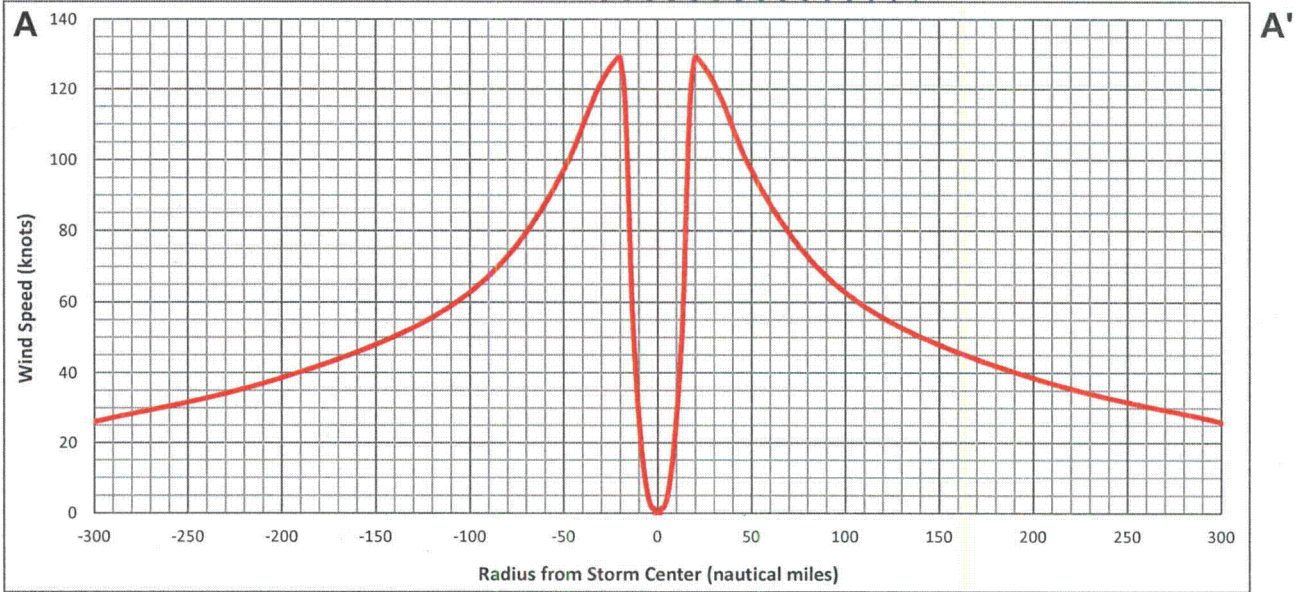
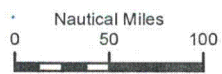
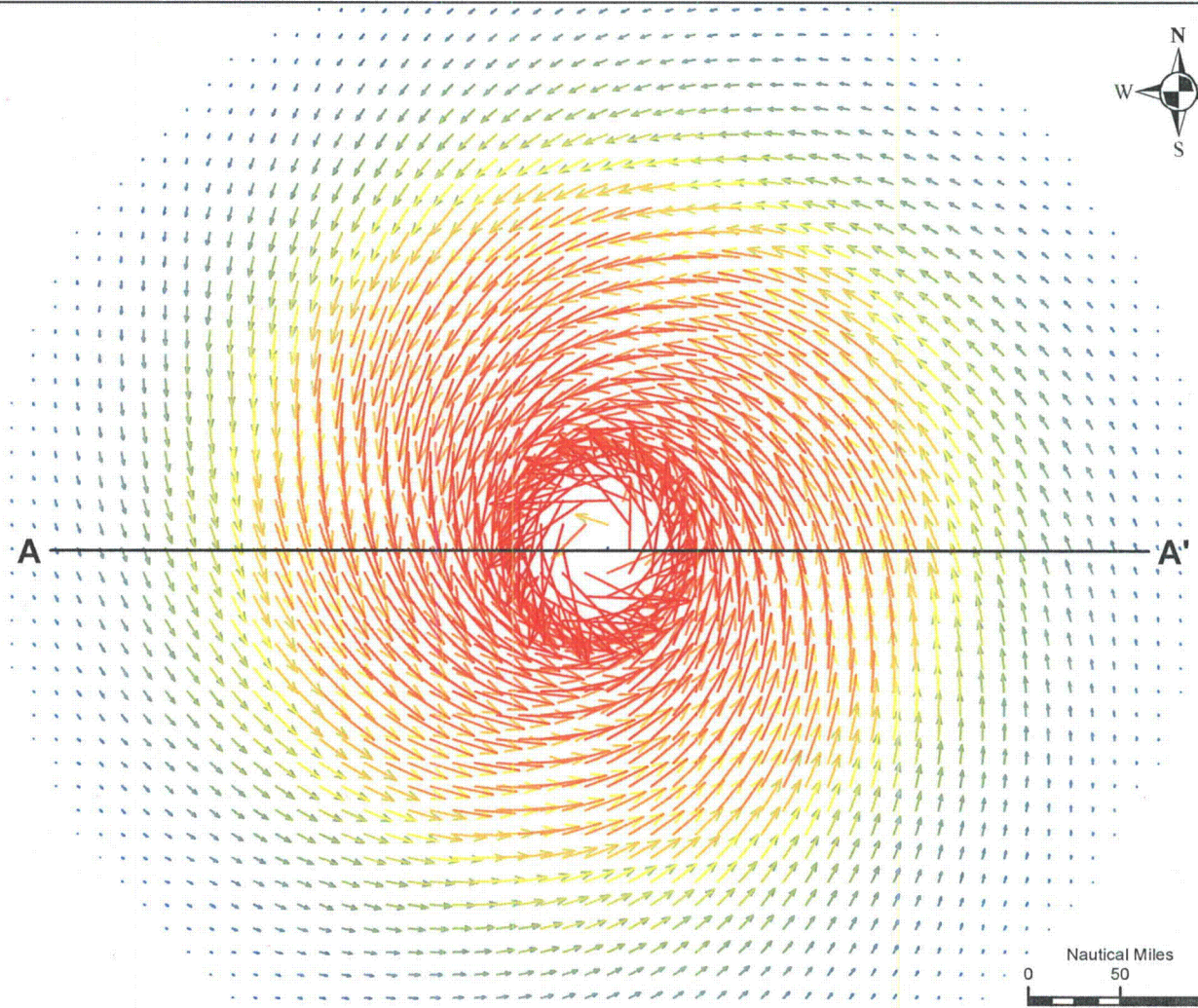
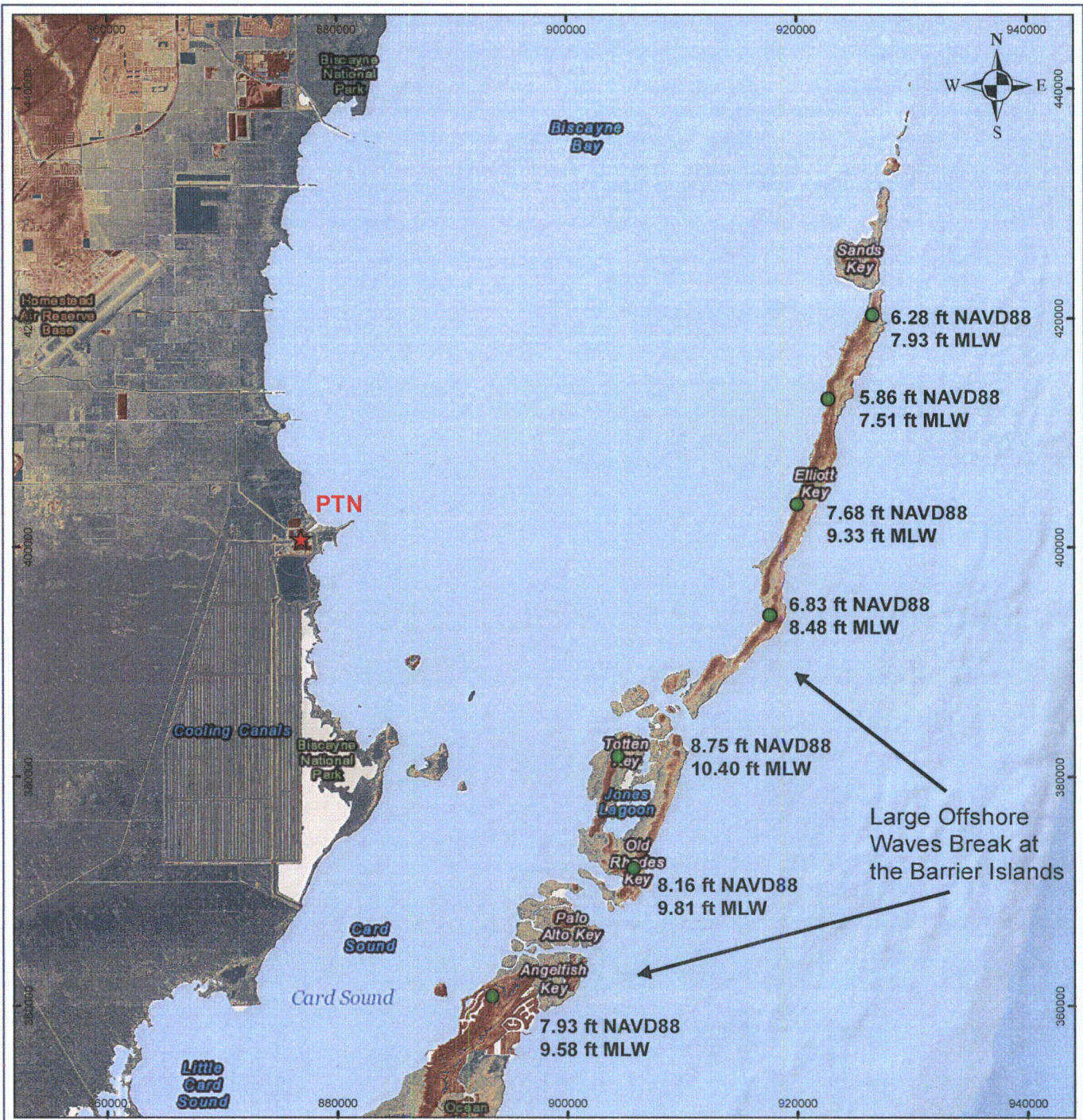


Figure 4-33

Wind Field and Wind Speed Plots
Flooding Hazard Reevaluation
Turkey Point Nuclear Generating Station Units 3&4 (PTN)

Document Name: FPLTP077-GIS-A028
Projection: State Plane Florida East, NAD 83 (US Feet)
By: MLS Date: 01/6/2013



References: 1. ESRI, 2013, 2. SFWMD, 2008.

Legend

- ★ Turkey Point Nuclear Generating Station Units 3&4 (PTN)
- Spot Elevation
- Miami-Dade Co. DEM (ft NAVD88)
High : 168.113
Low : -18.186
- Florida Keys DEM (ft NAVD88)
High : 93.9108
Low : -18.186

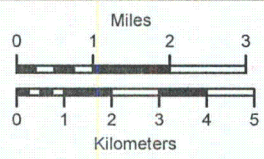
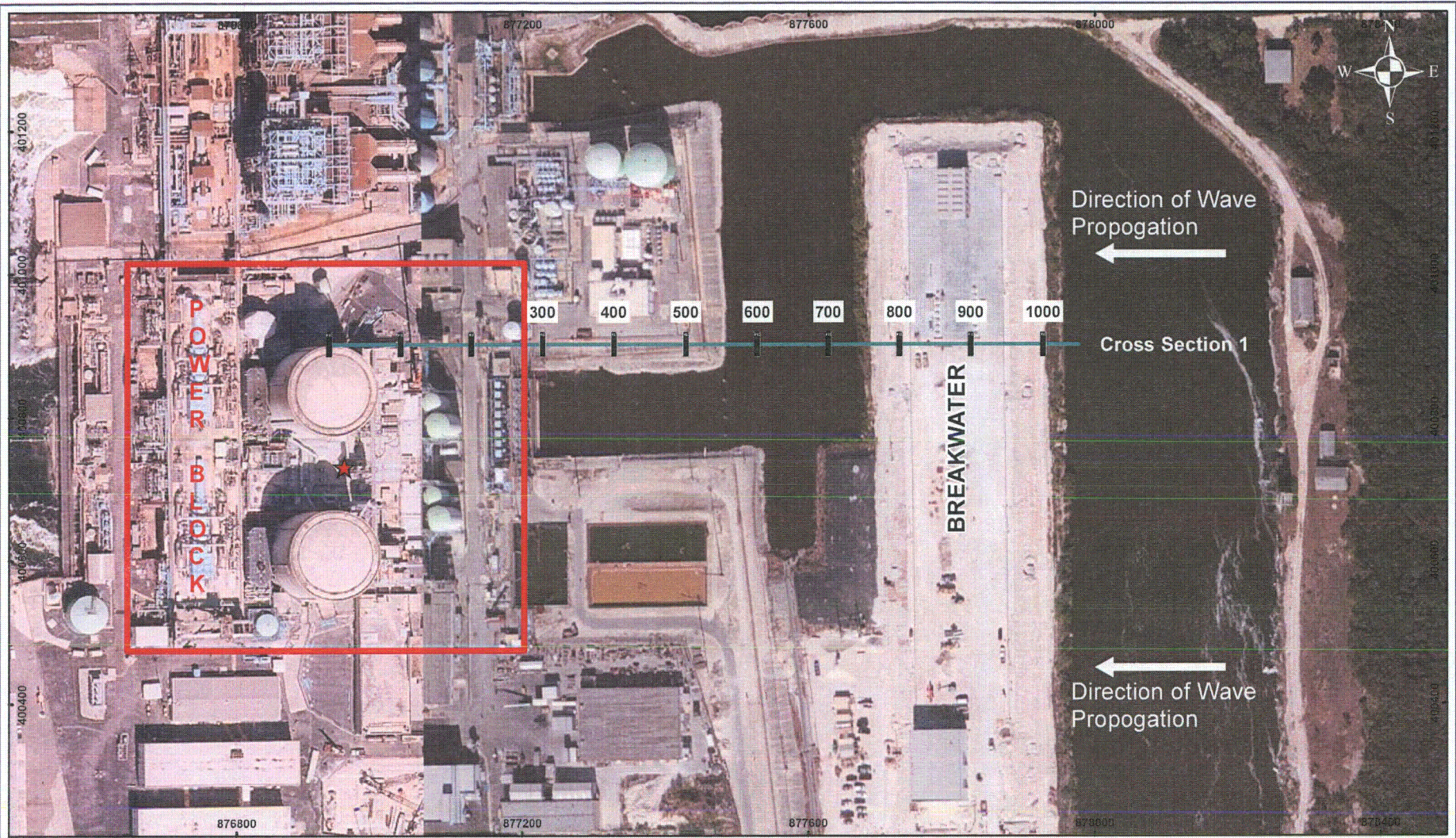


Figure 4-34

**Barrier Island Breakwater
Flooding Hazard Reevaluation
Turkey Point Nuclear Generating Station Units 3&4 (PTN)**

Document Name: FPLTP077-GIS-A024
Projection: State Plane Florida East, NAD 83 (US Feet)
Vertical Datum: NAVD88
By: MLS Date: 01/06/2013



References: 1. ESRI, 2013a.

Legend

- ★ Turkey Point Nuclear Generating Station Units 3 & 4 (PTN)
- Station (feet)
- Cross Section

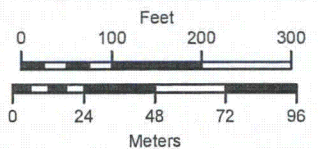


Figure 4-35

**Relationship of Breakwater to Power Block
Flooding Hazard Reevaluation
Turkey Point Nuclear Generating Station Units 3&4 (PTN)**

Document Name: FPLTP077-GIS-A025
 Projection: State Plant Florida East, NAD 83 (US feet)
 By: MLS Date: 01/06/2013

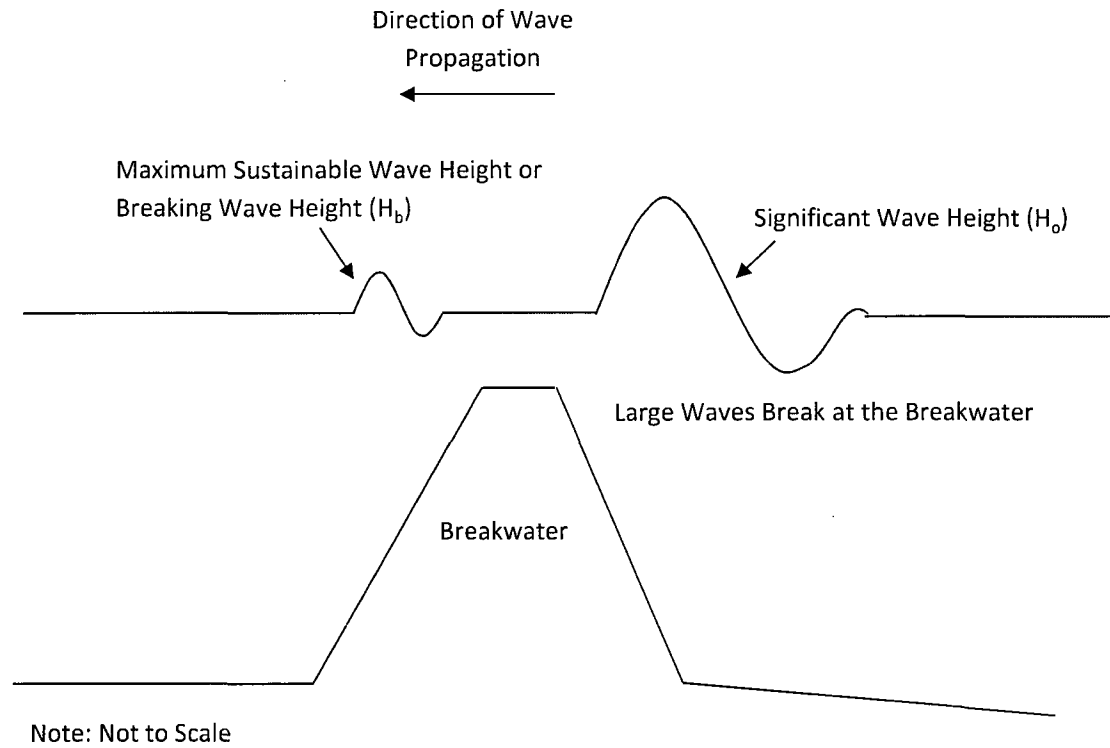


Figure 4-36

Maximum Wave Height Over
the Breakwater Structure

Flooding Hazard Reevaluation
Turkey Point Nuclear Generating Station Units 3&4 (PTN)

Cross Section 1

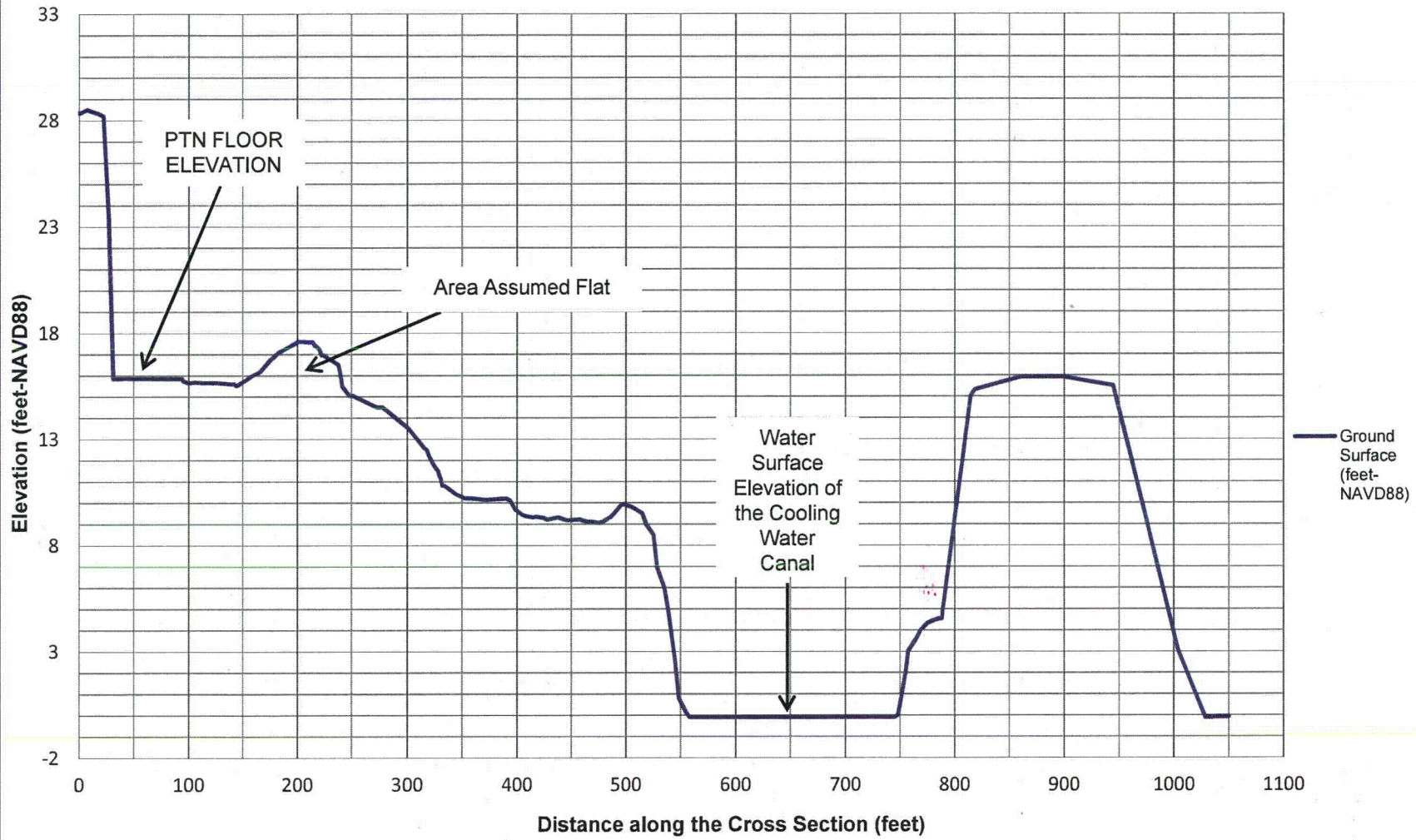


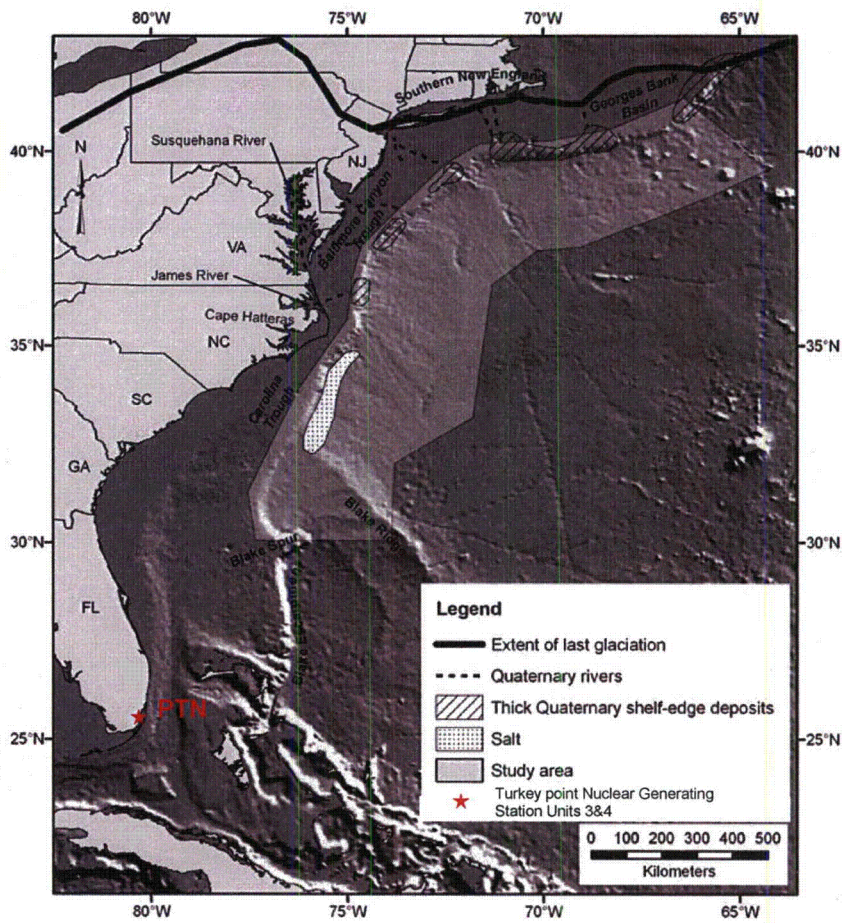
Figure 4-37

Representative Cross Section for Wave Analysis

Flooding Hazard Reevaluation
Turkey Point Nuclear Generating Station Units 3&4 (PTN)

Reference: Ford, 2012a.

Document Name: FPL062-GIS-A014
By: MLS Date: 2/8/2013

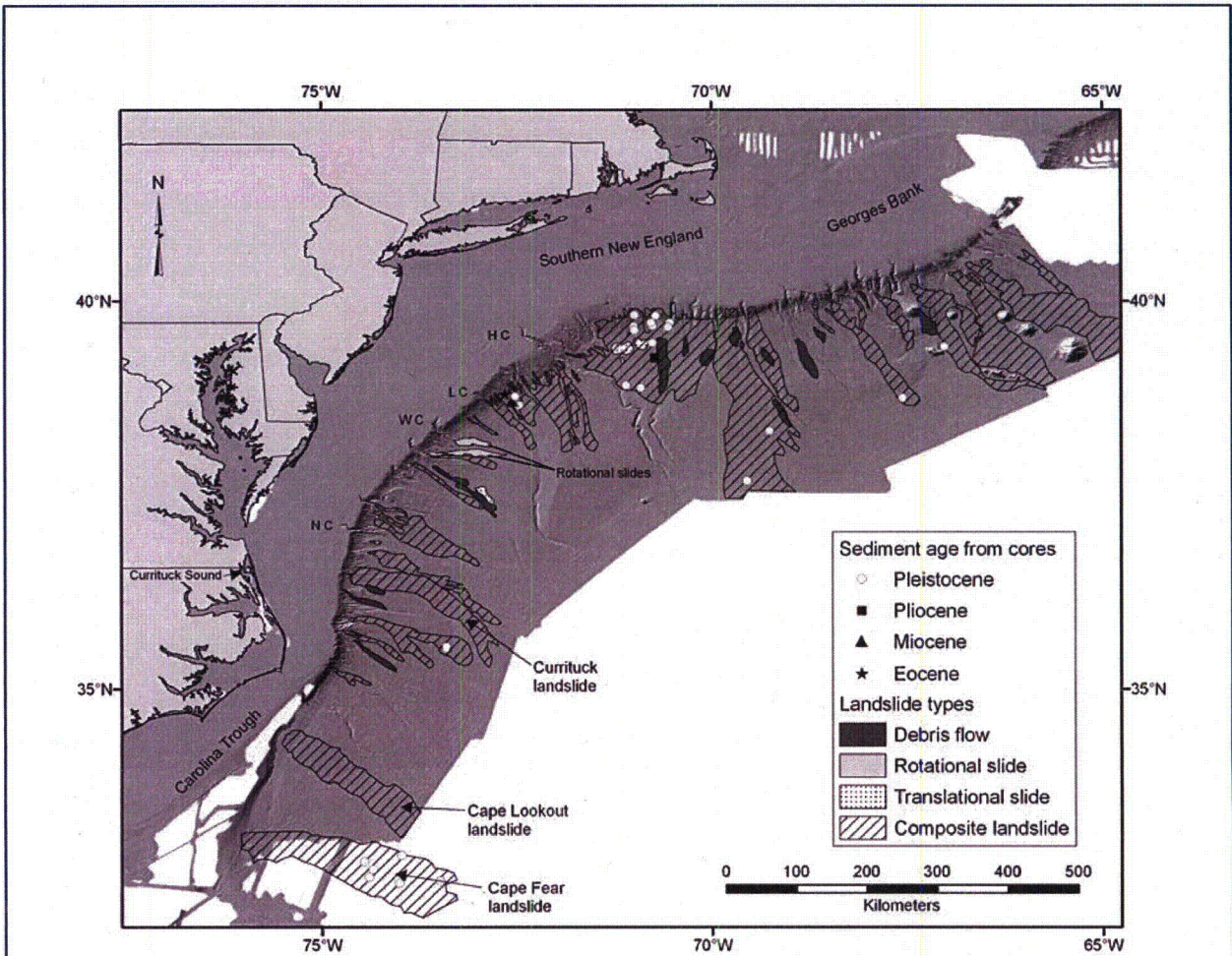


References: Atlantic and Gulf of Mexico Tsunami Hazard Assessment Group, 2008

Figure 4-38

Location Map Showing the Extent of the AGMTHAG Study Area and Geologic Features That May Influence Landslide Distribution along the U.S. Atlantic Margin

Flooding Hazard Reevaluation
Turkey Point Nuclear Generating Station Units 3&4 (PTN)



Note: HC = Hudson Canyon; LC = Linden Kohl Canyon; WC = Wilmington Canyon; NC = Norfolk Canyon.

References: Atlantic and Gulf of Mexico Tsunami Hazard Assessment Group, 2008

Figure 4-39

Distribution of Different Landslide Types
Along the U.S. Atlantic Margin

Flooding Hazard Reevaluation
Turkey Point Nuclear Generating Station Units 3&4 (PTN)

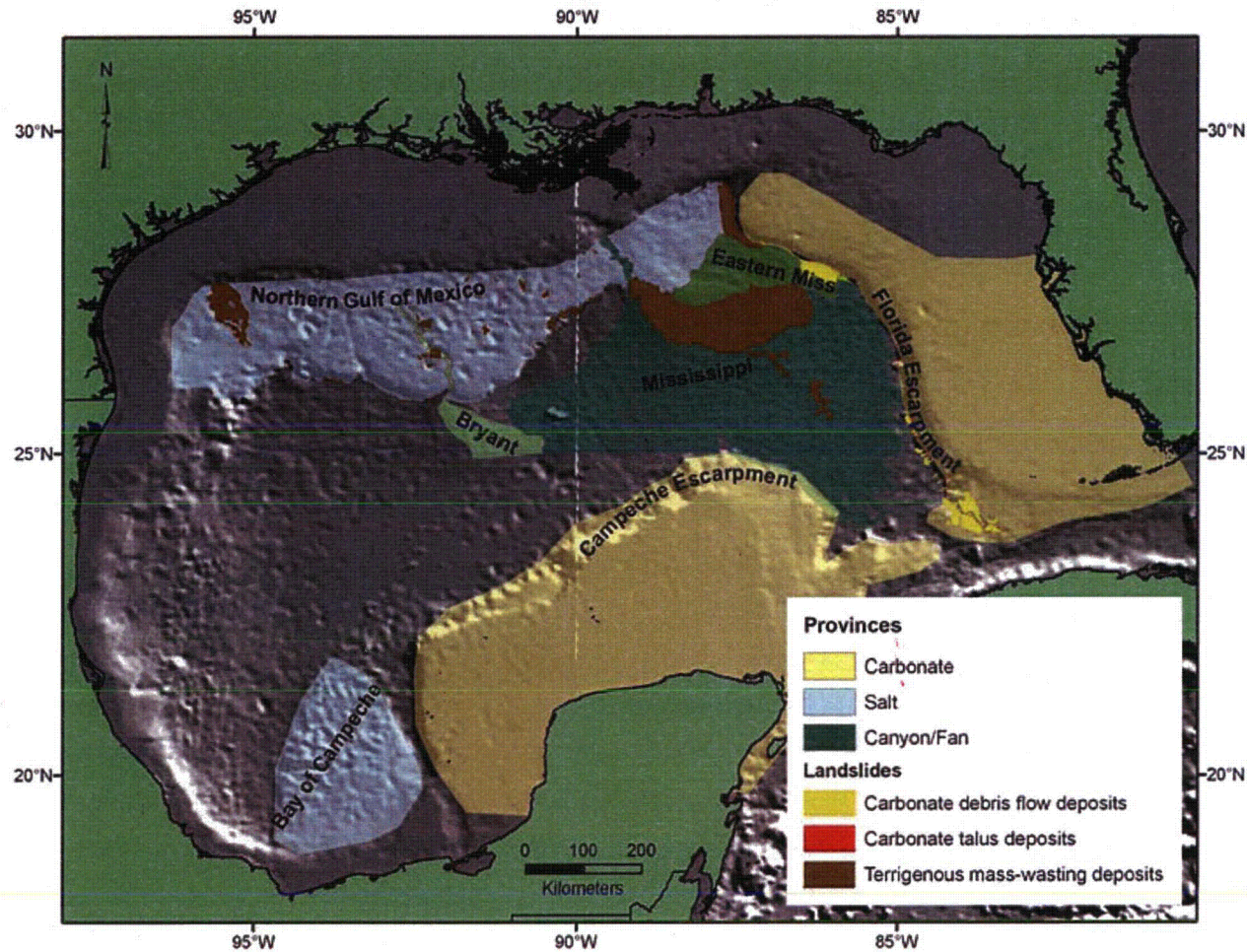


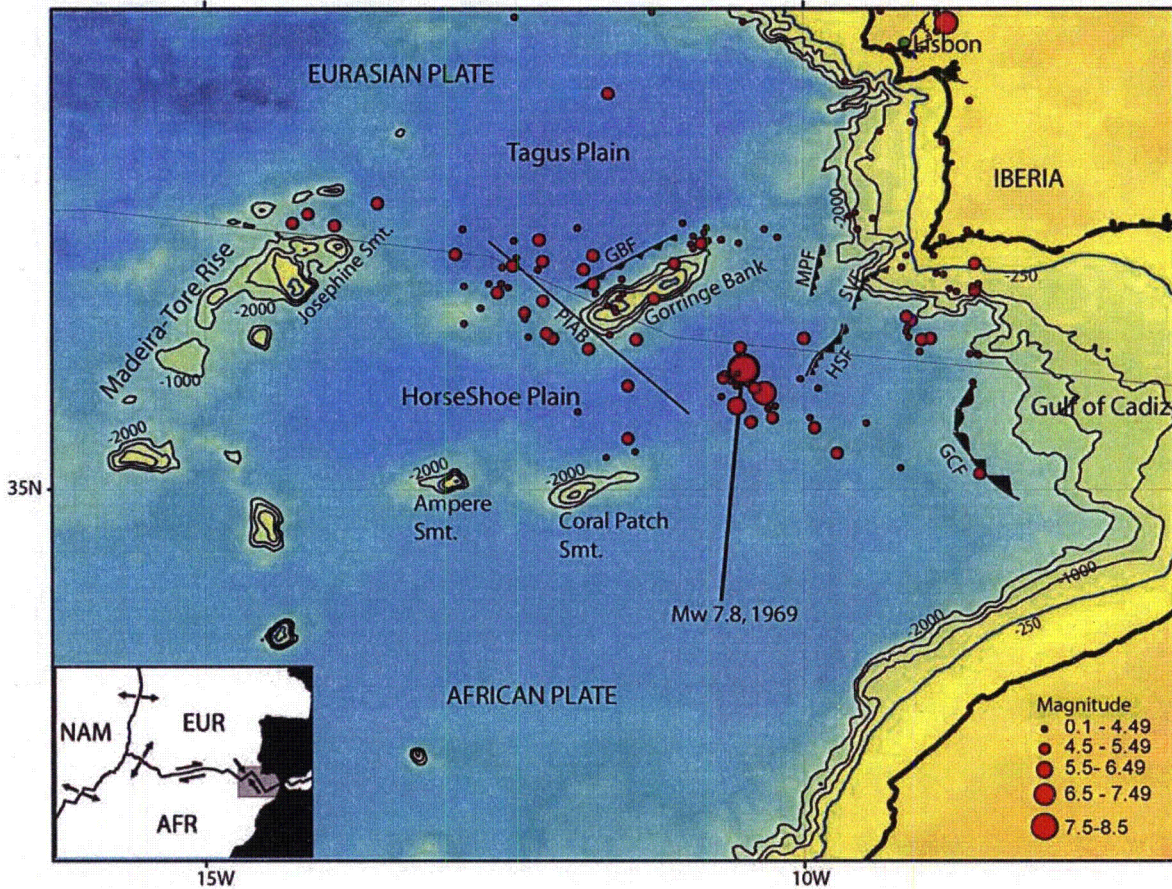
Figure 4-40

Location Map Showing the Size, Distribution, and Composition of Landslides in the Gulf of Mexico

Flooding Hazard Reevaluation
Turkey Point Nuclear Generating Station Units 3&4 (PTN)

References: Atlantic and Gulf of Mexico Tsunami Hazard Assessment Group, 2008

Document Name: FPL062-GIS-A019
By: MLS Date: 2/8/2013



Note: Barbed lines - proposed faults by previous studies: GBF - Goringe Bank Fault; MPF - Marqués de Pombal Fault; SVF - St. Vincente Fault; HSF - Horseshoe Fault; GCF - Gulf of Cádiz Fault. PIAB refers to the Paleo Iberia- Africa Plate Boundary. Depth contours are in meters (only contours from -250 to -2000 meters are shown).

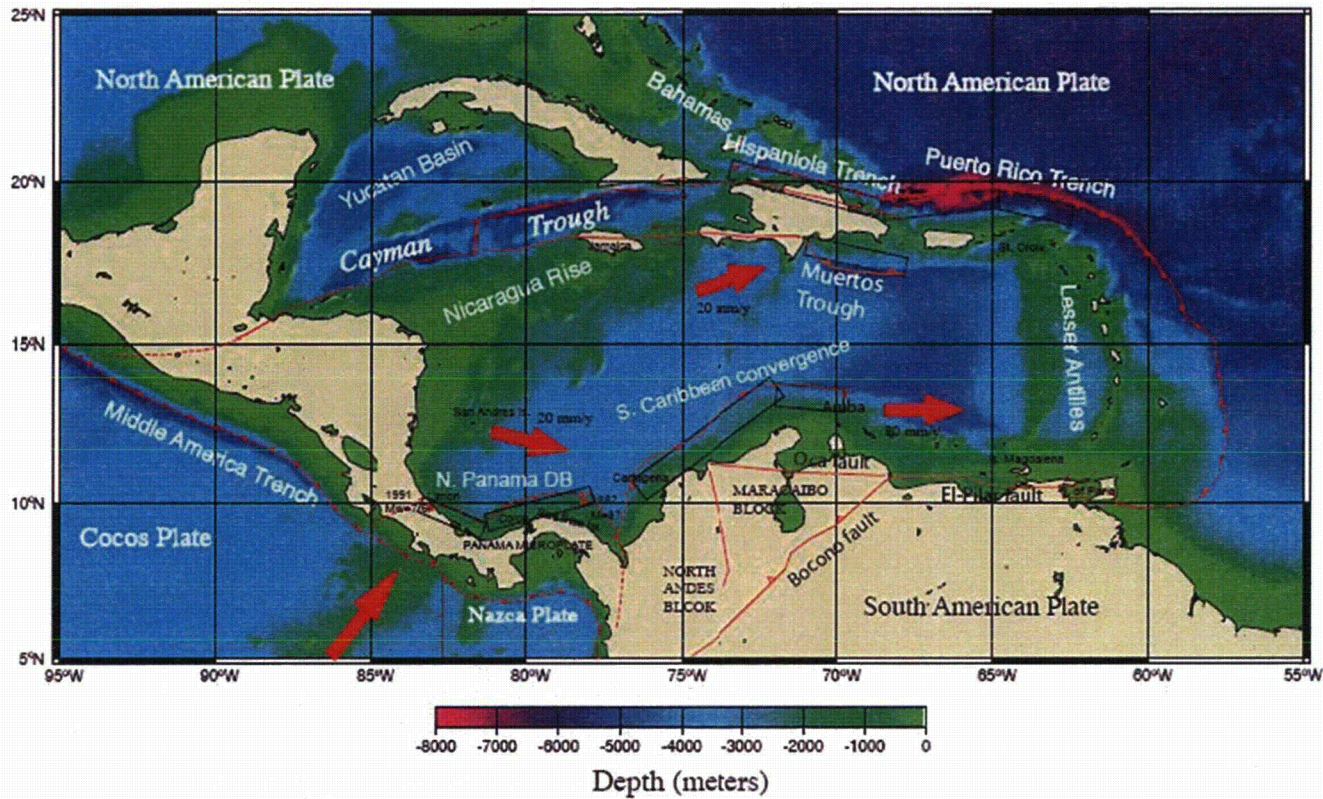
Inset Plates: NAM - North American Plate; EUR - Eurasia Plate; AFR - African Plate.

References: Atlantic and Gulf of Mexico Tsunami Hazard Assessment Group, 2008

Figure 4-41

**Plate Tectonic Setting and Bathymetry
of the Eastern Azores-Gibraltar Region**

**Flooding Hazard Reevaluation
Turkey Point Nuclear Generating Station Units 3&4 (PTN)**



Note: Red lines are plate boundaries and red arrows indicate plate movement.

Figure 4-42

The Caribbean Plate Boundary and its Tectonic Elements

Flooding Hazard Reevaluation
Turkey Point Nuclear Generating Station Units 3&4 (PTN)

References: Atlantic and Gulf of Mexico Tsunami Hazard Assessment Group, 2008

Document Name: FPL062-GIS-A019
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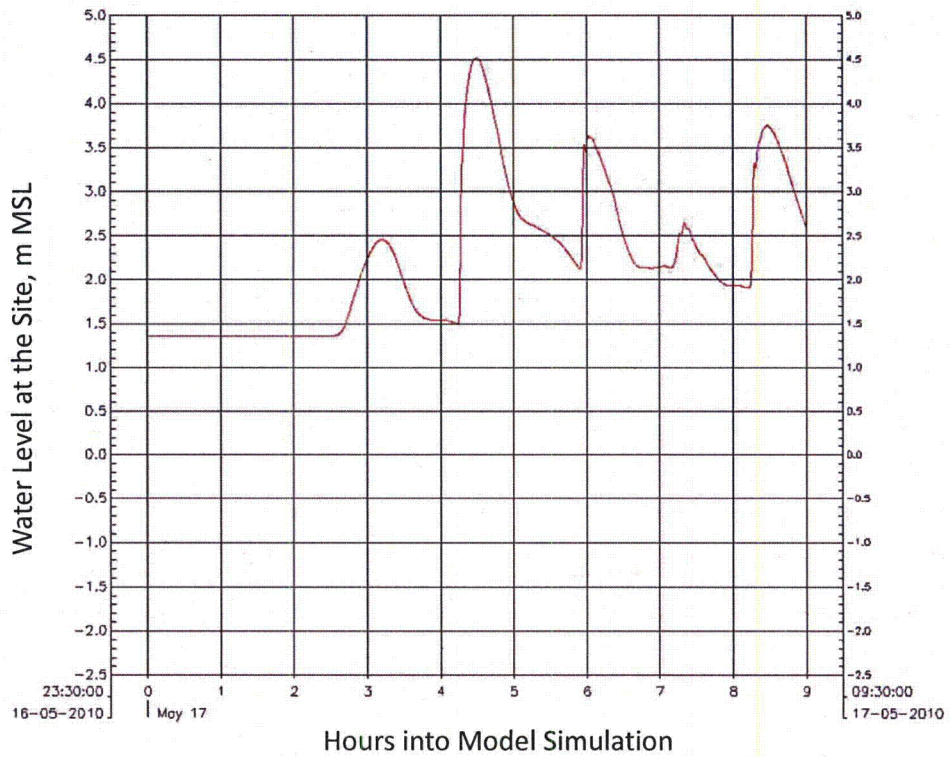


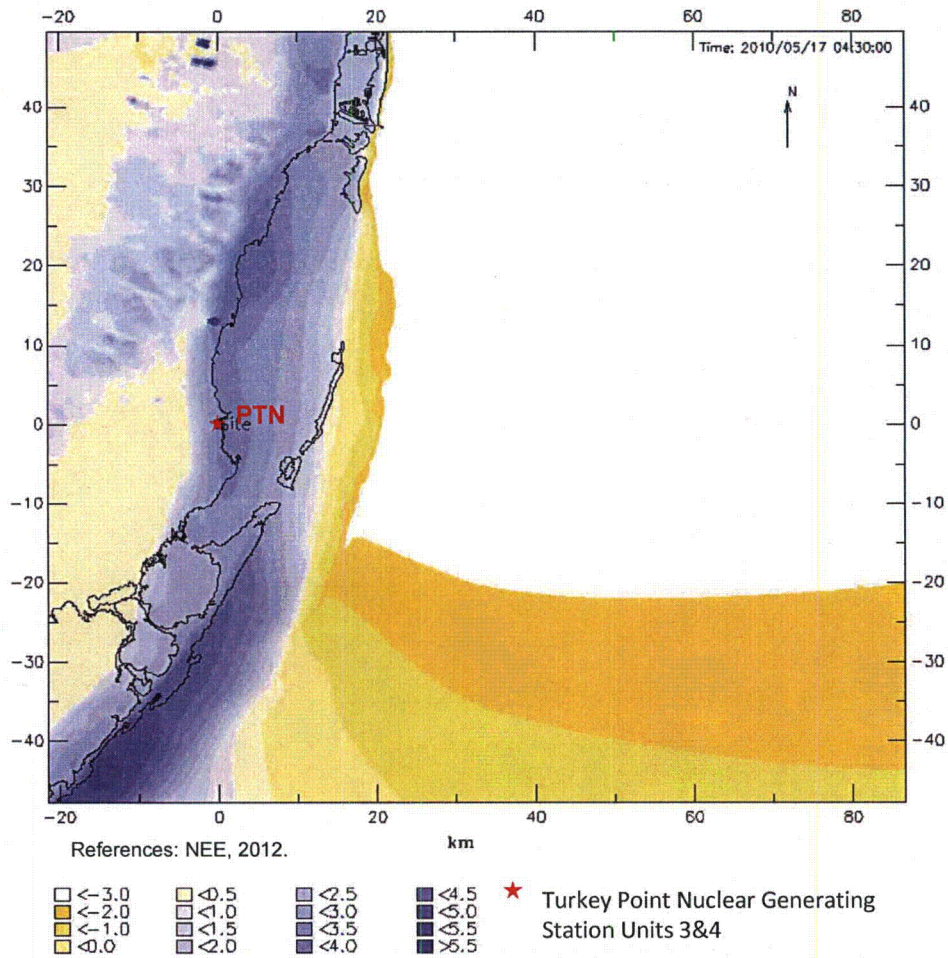
Figure 4-43

**Simulated Tsunami Marigram Near PTN
(with Manning's n of 0.02 and non-reflective boundaries)**

References: NEE, 2012.

Document Name: FPL062-GIS-A020
By: MLS Date: 2/8/2013

**Flooding Hazard Reevaluation
Turkey Point Nuclear Generating Station Units 3&4 (PTN)**



Note: Water levels are in meters relative to 1.36 m MSL; some (dry) land elevations are shown as flood water levels according to designation in Delft3D-FLOW.

Manning's n of 0.02 and non-reflective boundaries

Figure 4-44

Tsunami Water Level Contours near PTN
4.5 Hours in the Model Simulation Corresponding
to the Time Close to the Maximum Water Level at Site

Flooding Hazard Reevaluation
Turkey Point Nuclear Generating Station Units 3&4 (PTN)



Figure 4-45

Meteorological and USGS Stations Near PTN

Reference: NEE, 2012

Document Name: FPL062-GIS-A015
 By: MLS Date: 2/8/2013

Flooding Hazard Reevaluation
 Turkey Point Nuclear Generating Station Units 3&4 (PTN)

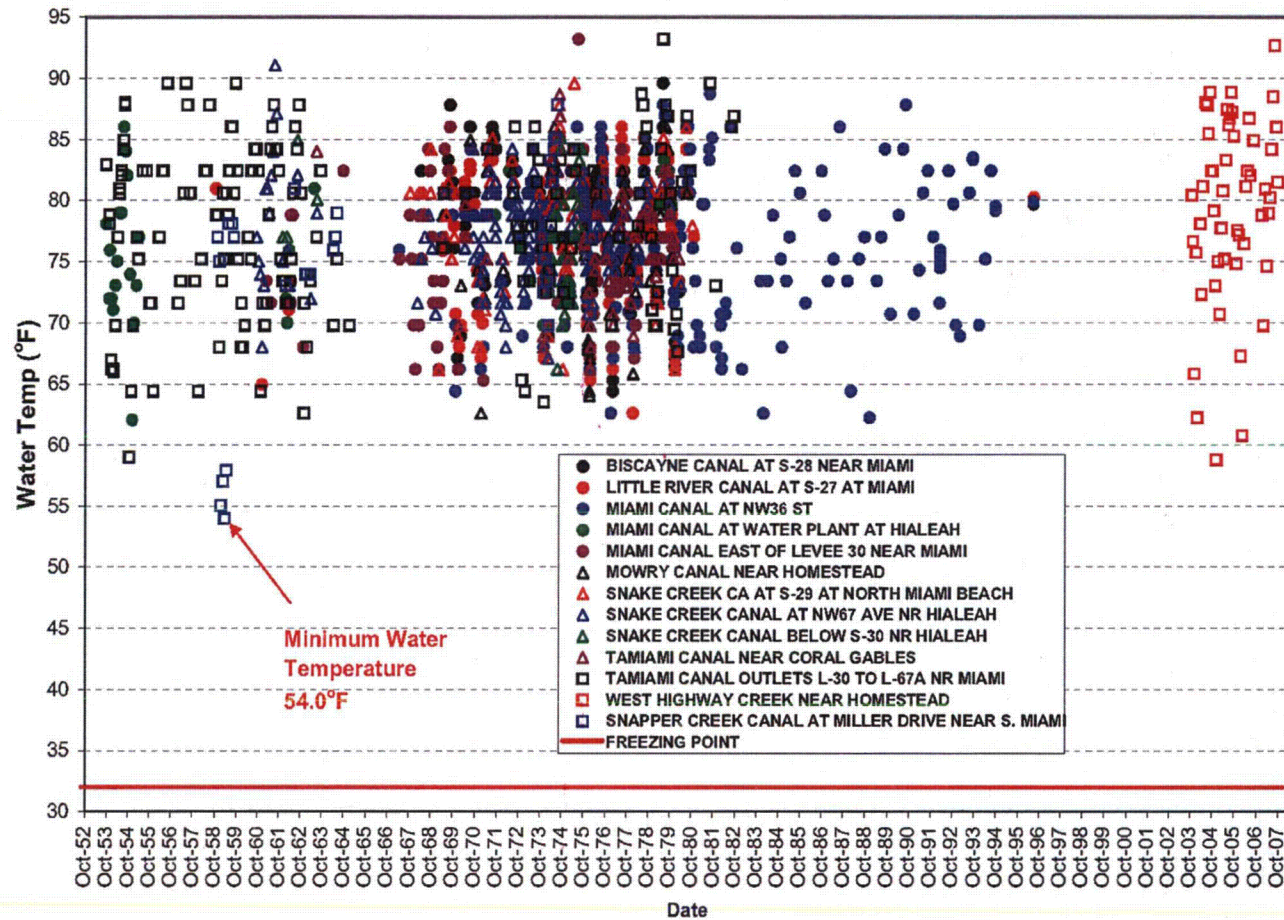


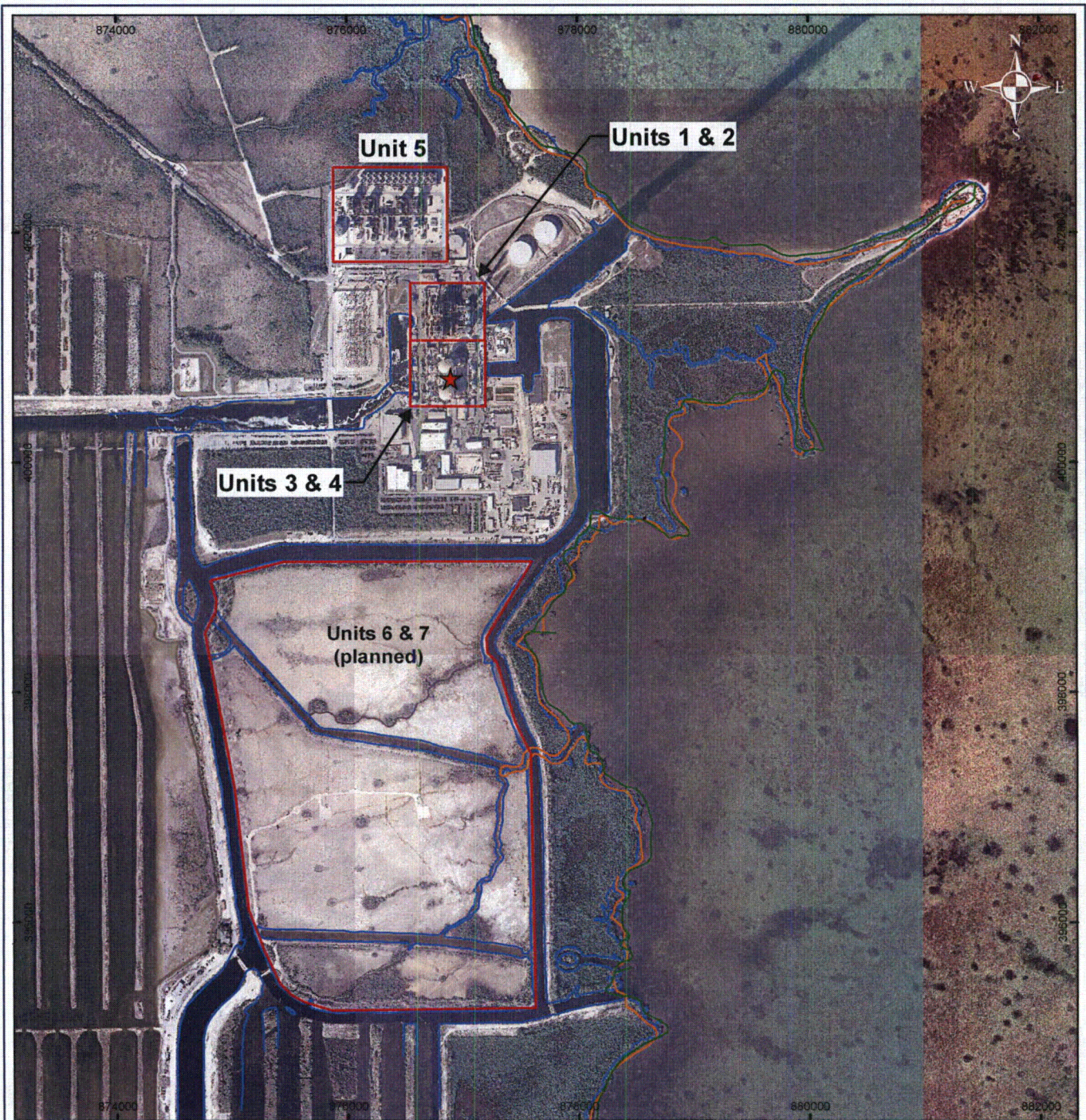
Figure 4-46

Water Temperatures at the
USGS Stations Near PTN

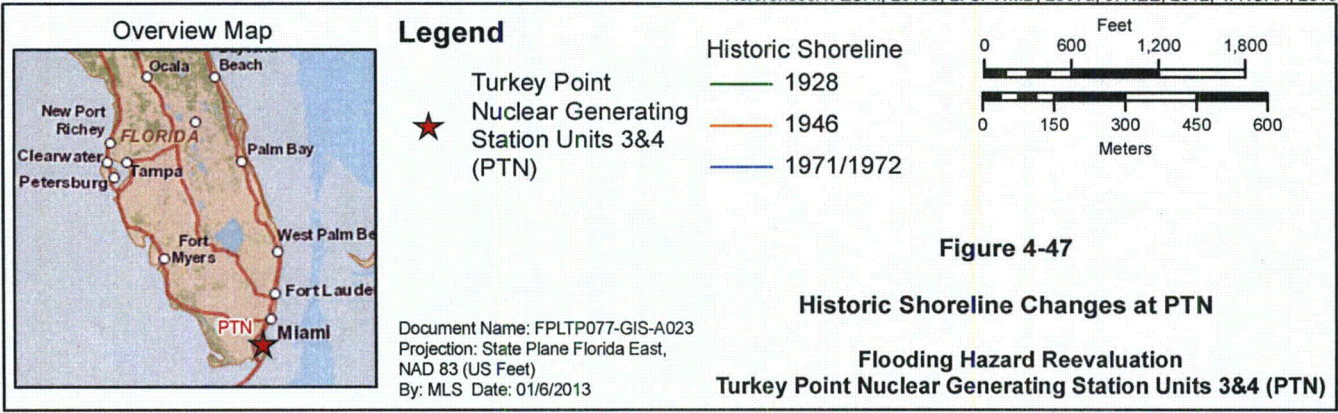
Flooding Hazard Reevaluation
Turkey Point Nuclear Generating Station Units 3&4 (PTN)

Reference: NEE, 2012.

Document Name: FPL062-GIS-A014
By: MLS Date: 2/8/2013



References: 1. ESRI, 2013b, 2. SFWMD, 2007a, 3. NEE, 2012, 4. NOAA, 2013.



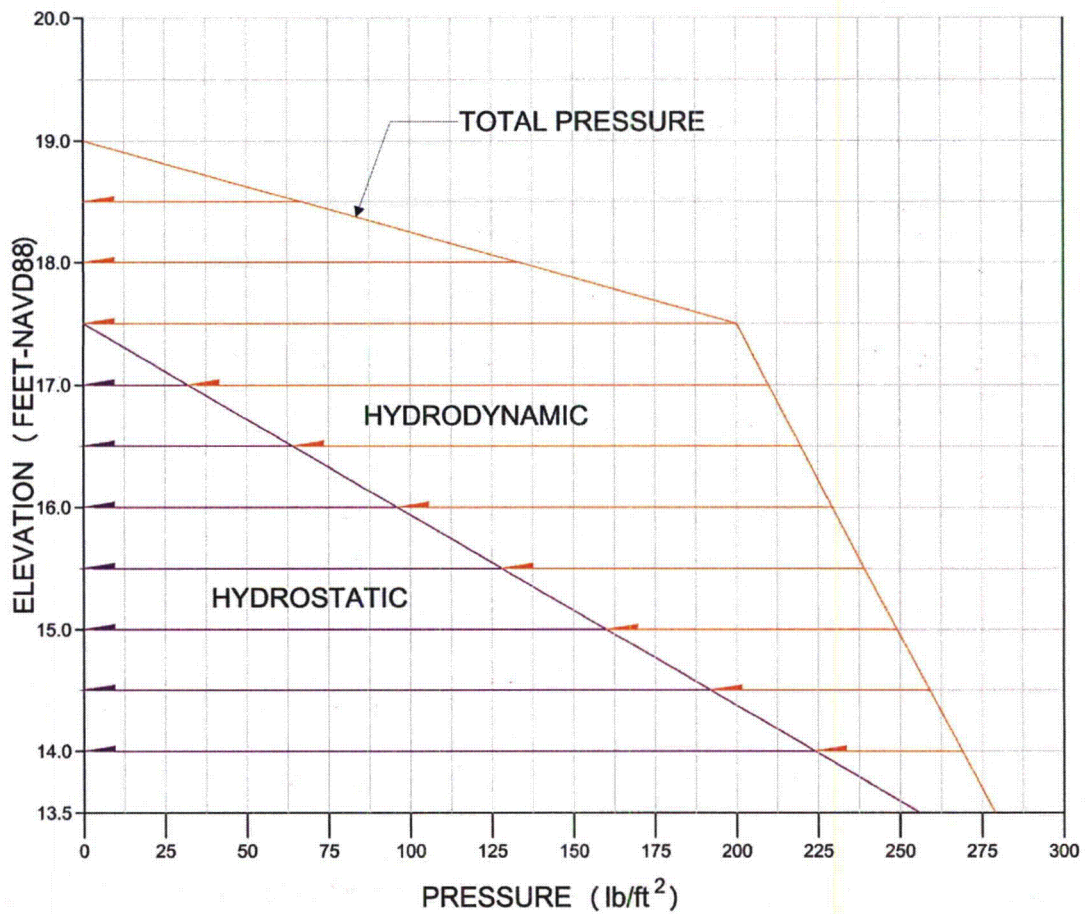


Figure 4-48

Hydrostatic and Hydrodynamic Pressure

Flooding Hazard Reevaluation
Turkey Point Nuclear Generating Station Units 3&4 (PTN)