

# High Tide Flooding Station Coverage Report

## Overview

This report compares the coverage of NOAA tide stations between historical (2020) and projected (2020-2100) datasets. It highlights which stations have data in both periods and identifies any mismatches.

## Data Comparison

### Historical vs Projected Coverage

Region	Historical Stations (2020)	Projected Stations	Coverage Match
North Atlantic	7 stations	4 stations	Partial - 57%
Mid Atlantic	23 stations	14 stations	Partial - 61%
South Atlantic	14 stations	11 stations	Partial - 79%
Gulf Coast	14 stations	8 stations	Partial - 57%
West Coast	16 stations	13 stations	Partial - 81%
Hawaii	7 stations	6 stations	Strong - 86%
Pacific Islands	3 stations	1 station	Poor - 33%
Virgin Islands	5 stations	2 stations	Poor - 40%
Puerto Rico	12 stations	2 stations	Poor - 17%
Alaska	0 stations	0 stations	N/A

### Coverage Analysis

- 1. **Strong Coverage Match (>80%):**
  - Hawaii (86%)
  - West Coast (81%)
- 2. **Moderate Coverage Match (60-80%):**
  - South Atlantic (79%)
  - Mid Atlantic (61%)
- 3. **Partial Coverage Match (40-60%):**
  - North Atlantic (57%)
  - Gulf Coast (57%)
  - Virgin Islands (40%)
- 4. **Poor Coverage Match (<40%):**

- Pacific Islands (33%)
- Puerto Rico (17%)
- Alaska (0%)

Key Coverage Issues

1. **Significant Station Loss:**

- Puerto Rico: Lost 10 stations (83% reduction)
- Pacific Islands: Lost 2 stations (67% reduction)
- Virgin Islands: Lost 3 stations (60% reduction)

2. **Moderate Station Loss:**

- Gulf Coast: Lost 6 stations (43% reduction)
- North Atlantic: Lost 3 stations (43% reduction)
- Mid Atlantic: Lost 9 stations (39% reduction)

3. **Minor Station Loss:**

- Hawaii: Lost 1 station (14% reduction)
- South Atlantic: Lost 3 stations (21% reduction)
- West Coast: Lost 3 stations (19% reduction)

Regional Summaries

North Atlantic Region

- **Projected Data Coverage:**
  - Total Records: 36 from 4 stations
  - Mean Flood Days by Scenario (days/year):
    - Low: 69.3
    - Intermediate-Low: 107.8
    - Intermediate: 152.1
    - Intermediate-High: 179.9
    - High: 194.9

Mid Atlantic Region

- **Projected Data Coverage:**
  - Total Records: 126 from 14 stations
  - Mean Flood Days by Scenario (days/year):
    - Low: 115.8
    - Intermediate-Low: 155.7
    - Intermediate: 186.4
    - Intermediate-High: 208.6
    - High: 220.4

South Atlantic Region

- **Projected Data Coverage:**

- Total Records: 99 from 11 stations
- Mean Flood Days by Scenario (days/year):
  - Low: 67.9
  - Intermediate-Low: 110.0
  - Intermediate: 158.0
  - Intermediate-High: 190.1
  - High: 206.5

## Gulf Coast Region

- **Projected Data Coverage:**

- Total Records: 72 from 8 stations
- Mean Flood Days by Scenario (days/year):
  - Low: 147.8
  - Intermediate-Low: 182.9
  - Intermediate: 206.0
  - Intermediate-High: 225.0
  - High: 235.0

## West Coast Region

- **Projected Data Coverage:**

- Total Records: 13 from 13 stations (2020 only)
- Mean Flood Days by Scenario (days/year):
  - Low: 5.2
  - Intermediate-Low: 5.4
  - Intermediate: 5.5
  - Intermediate-High: 5.5
  - High: 5.5

- **Note:** West Coast data appears limited to 2020 only, requiring investigation

## Hawaii Region

- **Projected Data Coverage:**

- Total Records: 54 from 6 stations
- Mean Flood Days by Scenario (days/year):
  - Low: 120.1
  - Intermediate-Low: 184.9
  - Intermediate: 219.1
  - Intermediate-High: 240.3
  - High: 252.2

## Pacific Islands Region

- **Projected Data Coverage:**

- Total Records: 9 from 1 station
- Mean Flood Days by Scenario (days/year):

- Low: 128.9
- Intermediate-Low: 187.2
- Intermediate: 220.0
- Intermediate-High: 243.9
- High: 256.7

Virgin Islands Region

- **Projected Data Coverage:**
  - Total Records: 18 from 2 stations
  - Mean Flood Days by Scenario (days/year):
    - Low: 2.1
    - Intermediate-Low: 49.2
    - Intermediate: 123.3
    - Intermediate-High: 168.9
    - High: 190.3

Puerto Rico Region

- **Projected Data Coverage:**
  - Total Records: 18 from 2 stations
  - Mean Flood Days by Scenario (days/year):
    - Low: 2.8
    - Intermediate-Low: 49.6
    - Intermediate: 122.3
    - Intermediate-High: 167.9
    - High: 189.2

Alaska Region

- **Projected Data Coverage:** No data available

Key Findings

- 1. **Regional Coverage Patterns:**
  - Gulf Coast and Hawaii show highest projected flooding frequencies
  - West Coast shows relatively low flooding frequencies
  - Virgin Islands and Puerto Rico show similar patterns with low initial flooding
  - All regions show significant increases in flooding days in higher scenarios
- 2. **Coverage Gaps:**
  - Alaska lacks projected data entirely
  - West Coast data appears limited to 2020 only
  - Some regions show significant differences between historical and projected station counts