High Tide Flooding Data Quality Analysis - mid_atlantic

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Overview

Analysis of high tide flooding data from 1920 to 2024.

Key Statistics

- Total records analyzed: 1996
- Average flood days per year (excluding missing data): 3.58
- Overall data completeness: 39.7%

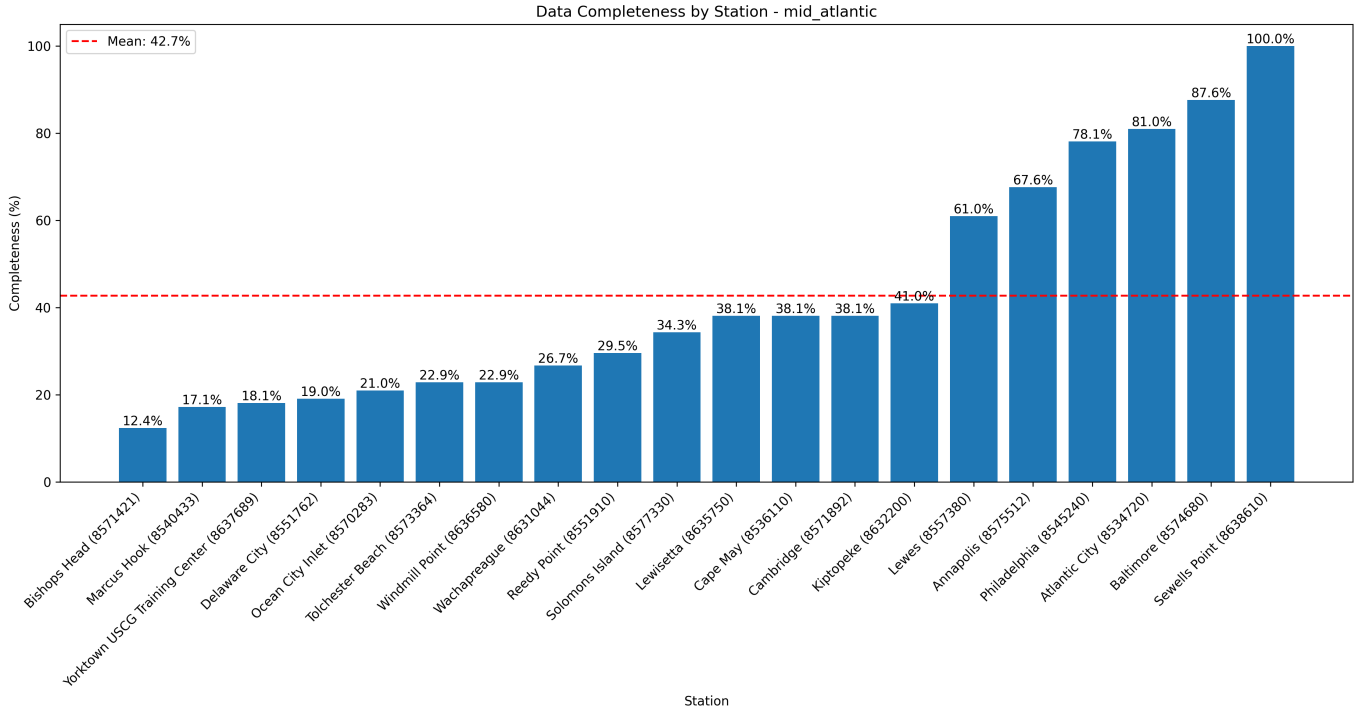
Monitoring Stations

Station ID	Name	Location	Sub-Region	Data Completeness
8534720	Atlantic City	39.36°N, 74.42°W	New Jersey Coast	81.0%
8536110	Cape May	38.97°N, 74.96°W	New Jersey Coast	38.1%
8537121	Ship John Shoal	39.31°N, 75.38°W	Delaware Bay	0.0%
8539094	Burlington, Delaware River	40.08°N, 74.87°W	Delaware Bay	0.0%
8540433	Marcus Hook	39.81°N, 75.41°W	Delaware Bay	17.1%
8545240	Philadelphia	39.93°N, 75.14°W	Delaware Bay	78.1%
8551762	Delaware City	39.58°N, 75.59°W	Delaware Bay	19.0%
8551910	Reedy Point	39.56°N, 75.57°W	Delaware Bay	29.5%
8555889	Brandywine Shoal Light	38.99°N, 75.11°W	Delaware Bay	0.0%
8557380	Lewes	38.78°N, 75.12°W	Delaware Bay	61.0%

Station ID	Name	Location	Sub-Region	Data Completeness
8570283	Ocean City Inlet	38.33°N, 75.09°W	Maryland Coast	21.0%
8571421	Bishops Head	38.22°N, 76.04°W	Upper Chesapeake	12.4%
8571892	Cambridge	38.57°N, 76.06°W	Upper Chesapeake	38.1%
8573364	Tolchester Beach	39.21°N, 76.24°W	Upper Chesapeake	22.9%
8574680	Baltimore	39.27°N, 76.58°W	Upper Chesapeake	87.6%
8575512	Annapolis	38.98°N, 76.48°W	Upper Chesapeake	67.6%
8577330	Solomons Island	38.32°N, 76.45°W	Upper Chesapeake	34.3%
8632200	Kiptopeke	37.17°N, 75.99°W	Lower Chesapeake	41.0%
8635750	Lewisetta	38.00°N, 76.47°W	Lower Chesapeake	38.1%
8636580	Windmill Point	37.62°N, 76.29°W	Lower Chesapeake	22.9%
8637689	Yorktown USCG Training Center	37.23°N, 76.48°W	Lower Chesapeake	18.1%
8638610	Sewells Point	36.94°N, 76.33°W	Lower Chesapeake	100.0%
8638901	CBBT, Chesapeake Channel	37.03°N, 76.08°W	Lower Chesapeake	0.0%
8631044	Wachapreague	37.61°N, 75.69°W	Virginia Coast	26.7%

Data Quality Analysis

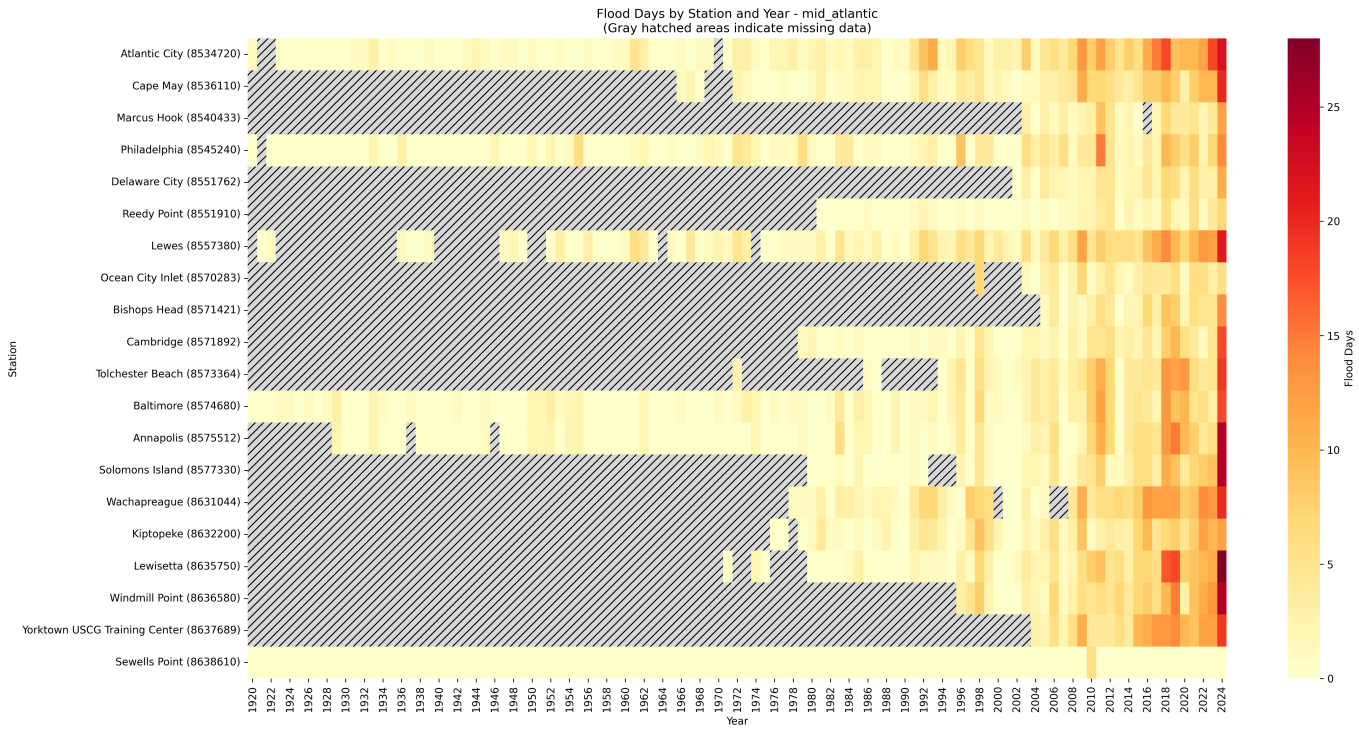
Data Completeness by Station



This visualization shows the percentage of days with valid data for each station:

- Stations are ordered by completeness percentage
- The red line indicates the regional mean completeness
- Regional mean completeness: 42.7%

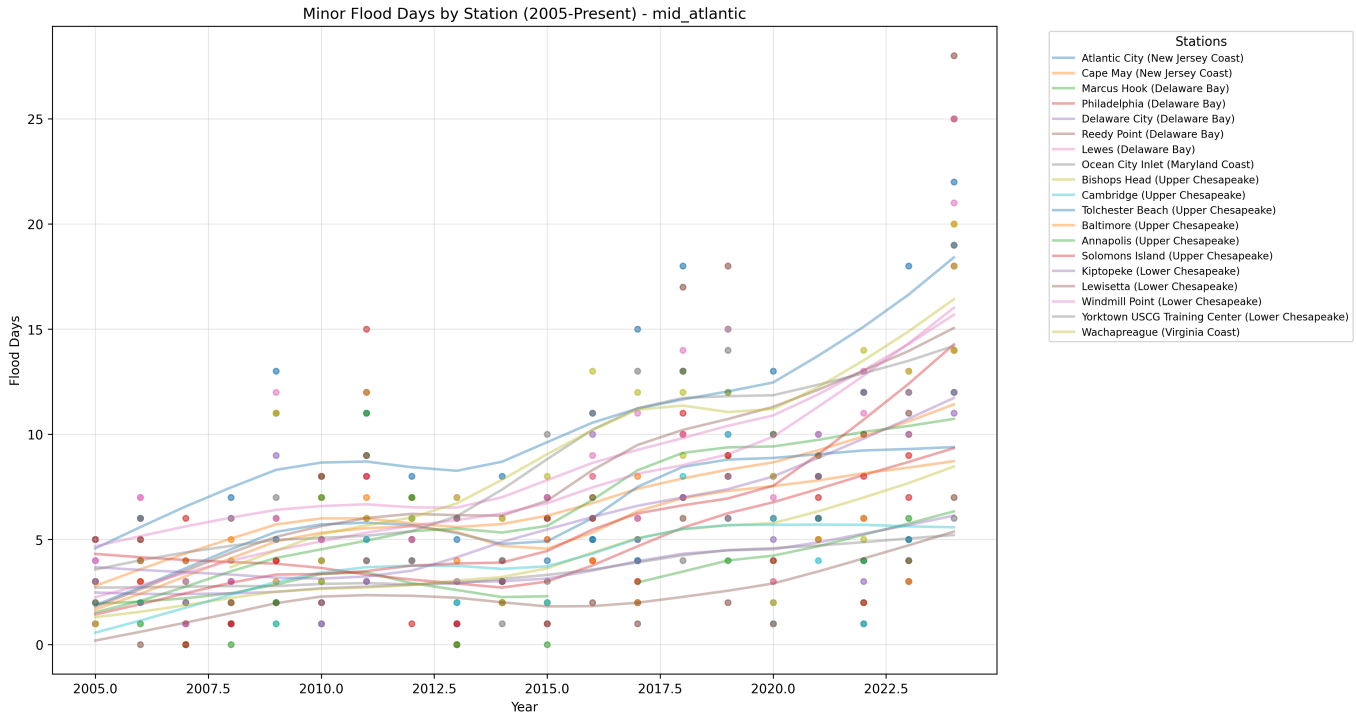
Flood Days Distribution



This heatmap shows the distribution of flood days across stations and years:

- Color intensity indicates number of flood days
- Gray hatched areas indicate missing data (>180 days missing in that year)
- White indicates zero flood days with complete data

Recent Flooding Trends (2005-Present)



This plot shows the trend in minor flood days for each station since 2005:

- Each line represents a different monitoring station
- Points indicate actual measurements
- Gaps in lines indicate missing data

Key Findings

Most Complete Records

- Sewells Point (Lower Chesapeake, Station 8638610): 100.0% complete
- Baltimore (Upper Chesapeake, Station 8574680): 87.6% complete
- Atlantic City (New Jersey Coast, Station 8534720): 81.0% complete

Highest Flooding Activity

- Yorktown USCG Training Center (Lower Chesapeake, Station 8637689): 8.95 flood days per year
- Windmill Point (Lower Chesapeake, Station 8636580): 6.79 flood days per year
- Wachapreague (Virginia Coast, Station 8631044): 6.25 flood days per year