Indicator: Clams in the Hampton-Seabrook Estuary

Question

What is the current population of clams in Hampton-Seabrook Harbor and how has it changed over time?

Short Answer

The most recent clam population in Hampton-Seabrook Harbor (in 2015) was 1.4 million clams. The population has declined most years since 1997.

PREP Goal

Increase the number of adult clams in Hampton-Seabrook Estuary to 5.5 million clams by 2020 (from the PREP Comprehensive Conservation and Management Plan, PREP 2010).

Why This Matters

Soft shell clams provide recreational opportunities to state residents. Clams consume phytoplankton and other detrital material and therefore have a significant impact on coastal and estuarine ecosystems.

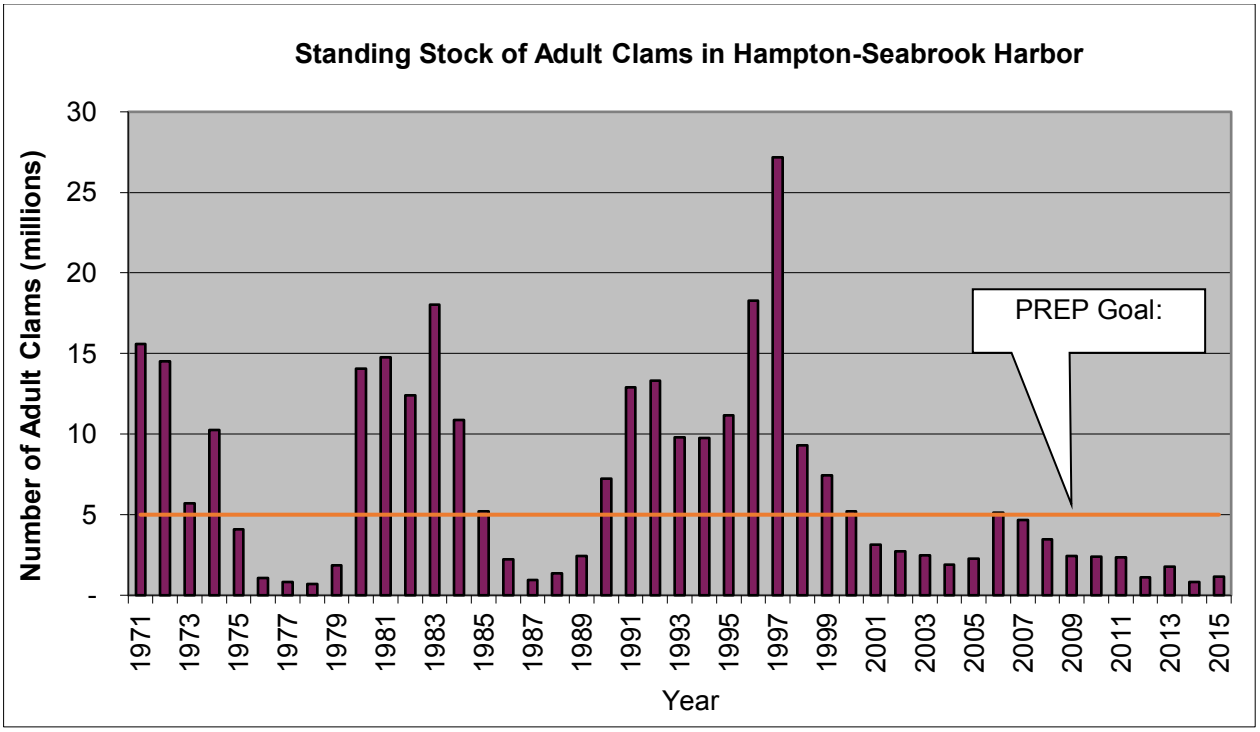

Figure C-1. Standing Stock of Adult Clams in Hampton-Seabrook Harbor. Number of adult clams is calculated by multiplying clam densities by the acreage of clam flats in Hampton-Seabrook Harbor. Data Source: Normandeau Associates, with support from NextEra Energy.

Explanation (from 2018 State of Our Estuaries Report)

In 2015, there were 1.4 million clams in Hampton-Seabrook Harbor. Since 2012, clam populations have remained below the PREP goal of 5.5 million clams and below the average level (2.4 million) from 2009 to 2011 (Figure C-1).

Clams may be limited by a type of cancer (*Hemic neoplasia*) that affects marine bivalves but is not dangerous to humans. Figure C-2 shows that the percentage of clams infected with *Neoplasia* has increased since 2002. Research suggests there are several factors that make clams more susceptible to this disease, especially pollution (mainly heavy metals and hydrocarbons) and warming water temperatures (Carballal et al. 2015).

Green crabs eat clams and have also been shown to reduce clam populations. However, Figure C-3 shows that green crab abundance in Hampton-Seabrook Harbor has steadily declined – for unknown reasons – between 2011 and 2015.

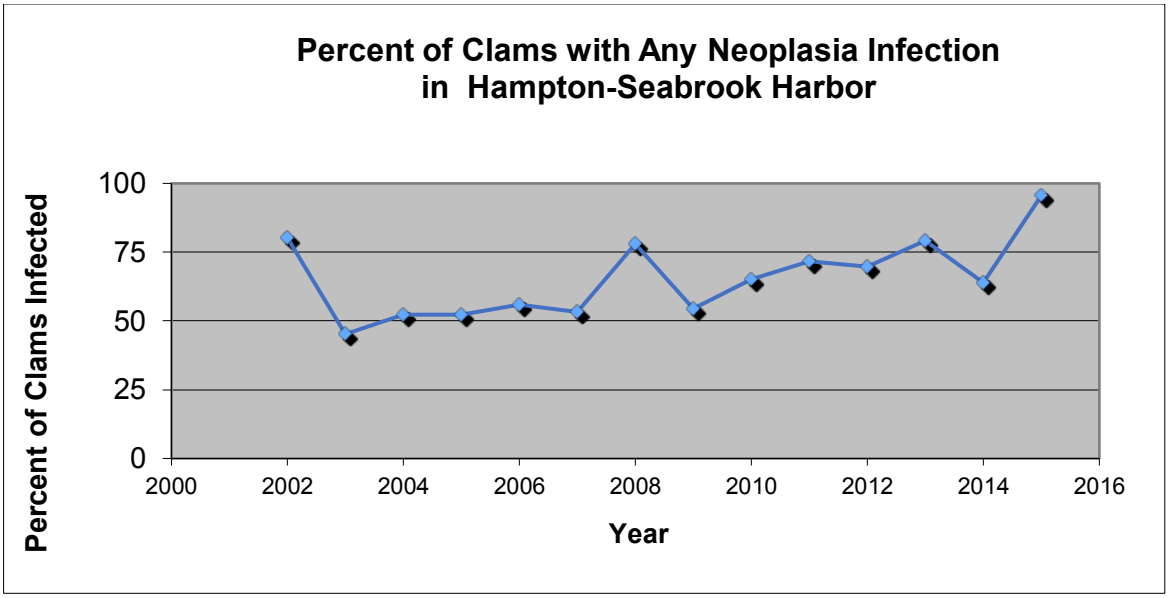

Figure C-2. Percent of clams with any neoplasia infection in Hampton- Seabrook Harbor. Data Source: Normandeau Associates, with support from NextEra Energy.

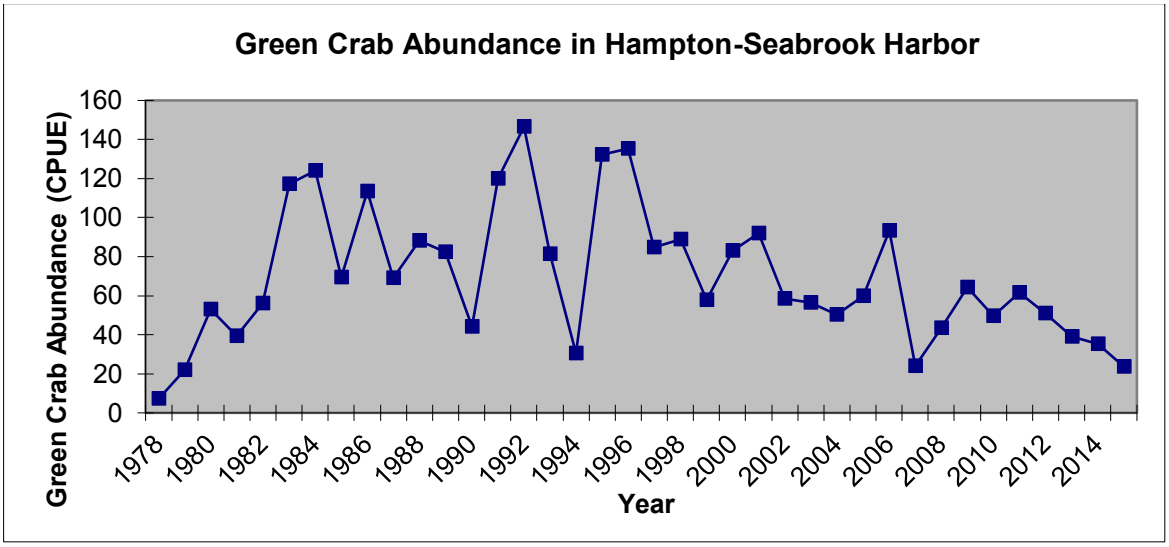

Figure C-3: Green crab abundance in Hampton-Seabrook Harbor. CPUE = catch per unit effort. Crabs are caught in baited traps, twice a month year-round with the exception of February and March. Data Source: Normandeau Associates, with support from NextEra Energy.

Methods and Data Sources

The location of each flat is shown in Figure C-4. For each flat, the mean densities for adults were calculated by summing the mean densities for the >50mm size class using data in the Seabrook Station Annual Data Reports.

The standing stock of adult clams was calculated by multiplying the average density of adult clams in each flat in each year by the most recent estimate of the size of the flat. Clam densities have been measured annually since 1971 but flat boundaries have only been monitored seven times between 1977 and 2015 (Table C-1). For the years when the flat boundaries were not surveyed, it was assumed that the most recent boundary for that flat was still accurate. This assumption introduces some uncertainty into the estimates for these years. The standing stock in the three major flats was summed to estimate the total standing stock in Hampton-Seabrook Harbor.

Looking at adult clam densities (per square meter) is one way to eliminate the uncertainty associated with changes in clam flat area. Figure C-5 shows that densities have been low—relative to previous peaks—for the last 15 years.

Figure C-4. Map of Hampton-Seabrook Estuary, showing location of the three major clam flats.

Table C-1. Acres of the three major clam flats used in this report.

Year	Common Island Flat	Confluence Flat	Middle Ground Flat	Total
1977	54.9	27.2	49.7	131.8
1979	54.8	26.7	53.5	135.0
1981	54	24.7	50.8	129.5
1983	52.7	26.4	49.9	129.0
1984	50	21.7	47.9	119.6
1995	45.7	26.4	47.3	119.4
2002	36.9	23.4	57.8	118.1
2013	32.3	21.9	48.7	102.9

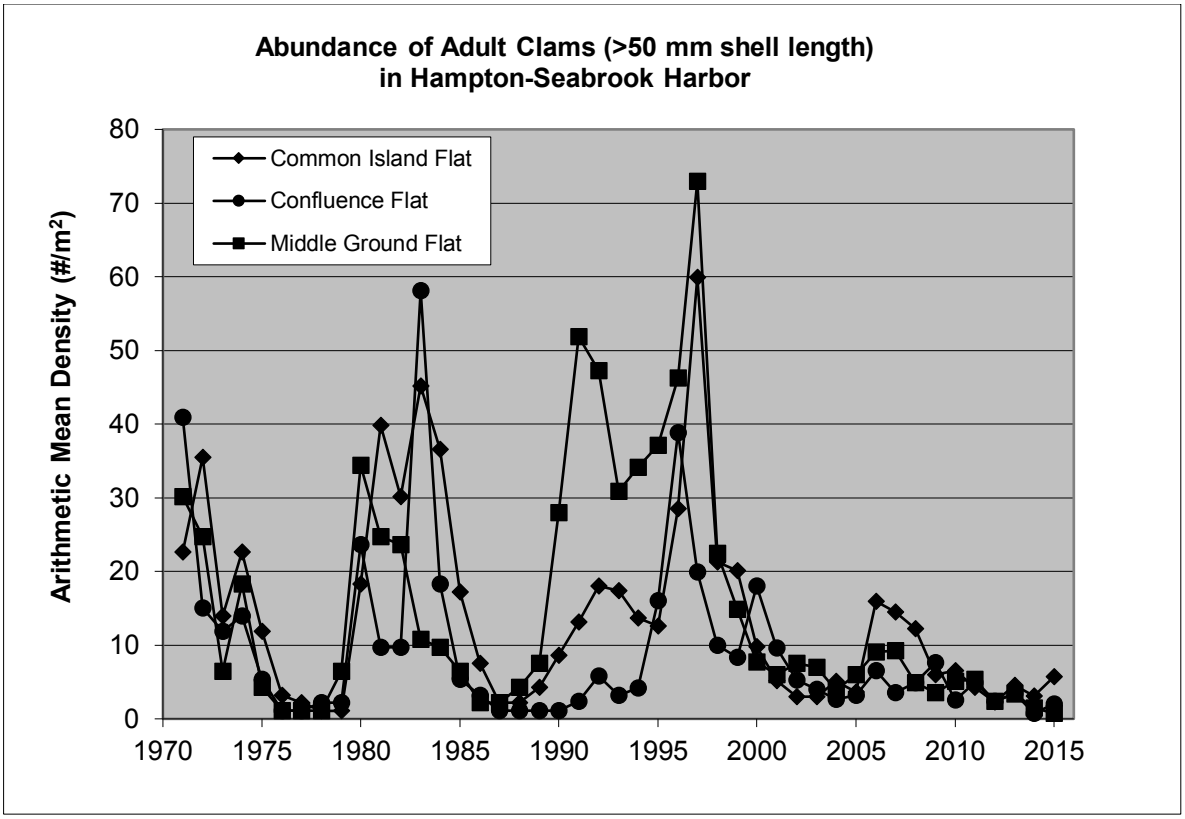

Figure C-5. Abundance of adult clams, measured by number of clams per square meter, for three clam flats. Data Source: Normandeau Associates, with support from NextEra Energy.

Data Sources

The Seabrook Station Soft Shell Clam Monitoring Program, implemented by Normandeau Associates, conducts annual surveys of clam densities in the three major flats in Hampton-Seabrook Harbor.

Technical Advisory Committee (TAC) Discussion Highlights

As part of the January 2017 TAC meeting, participants discussed in detail the methods and results for the clam indicator (PREP 2017c). Complete notes are available at: http://prepestuaries.org/prep-technical-advisory-committee/

References Cited

Carballal MJ, Barber BJ, Iglesias D Villalba A. 2015. neoplastic diseases of marine bivalves. *Journal of Invertebrate Pathology*. 131 (2015) 83-106

PREP 2010. Piscataqua Region Comprehensive Conservation and Management Plan, Piscataqua Region Estuaries Partnership: D.B.Truslow Associates, Mettee Planning Consultants, 2010, Durham, NH. http://scholars.unh.edu/prep/22/

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