

Collector(s): Estuarine Monitoring Team (WaRO)

Locations and Date: Edenhouse, Pembroke Creek, Edenton Bay, 6/12/2017

Reason Collected: Discolored water/suspected bloom

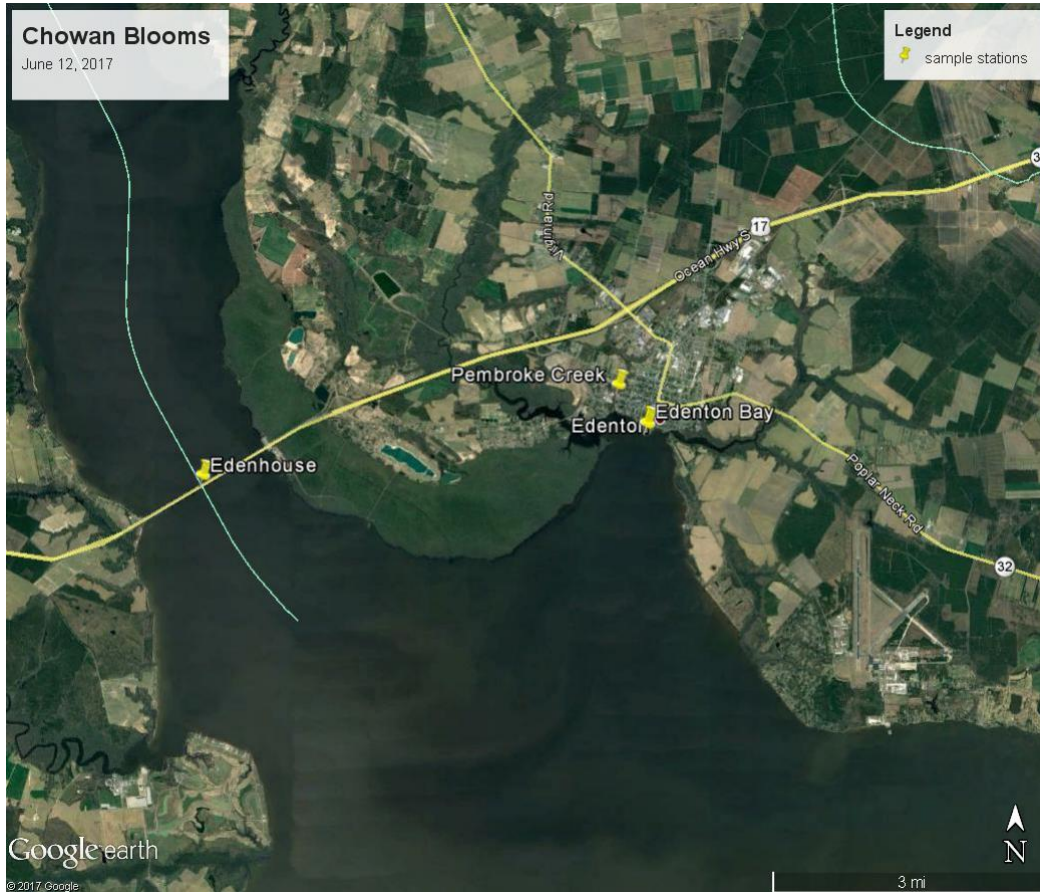


Figure 1: Locations where samples were collected in and near Chowan River

**Sample Information:** Green water was observed in the Chowan River and into the Albemarle Sound on June 11<sup>th</sup>. The Estuarine Monitoring Team investigated the area on June 12<sup>th</sup> and collected samples for algal analysis at two locations—a regular monitoring station at Edenhouse (D9490000) and at Edenton Bay in Edenton, NC. A member of the Chowan Edenton Environmental Group gave the EMT a sample from Pembroke Creek (Figure 1).

**Results of Analysis:** The algae forming the bloom was the filamentous bluegreen *Dolichospermum* (formerly called *Anabaena*, Figures 2 and 3). The total algal densities and algal biovolumes (biomass) are listed in Table 2.

DWR definitions of an algal bloom include dissolved oxygen concentrations at or above 9 mg/L (110% saturation), pH higher than 8. Physical data at the two sites investigated by the EMT confirm a bloom was in progress (Table 1). Additional DWR definitions of algal blooms include algal concentrations at or above 10,000 units/ml (unit density) or 5,000 mm<sup>3</sup>/m<sup>3</sup> (biovolume).

The total algal density and biovolume of the sample collected at Edenhouse were 4,500 units/ml and 7,000 mm<sup>3</sup>/m<sup>3</sup>. The unit density of the algae for the Edenhouse sample did not meet the definition of an algal bloom, but the biovolume concentration did. Both algal bloom definitions of unit density and biovolume were met for the samples collected at Edenton Bay and Pembroke Creek. The total algal density and biovolume of the sample collected at Edenton Bay were 23,800 units/ml and 28,500 mm<sup>3</sup>/m<sup>3</sup>. The total algal density and biovolume of the sample collected at Pembroke Creek were 19,000 units/ml and 57,000 mm<sup>3</sup>/m<sup>3</sup>.

**Ecological Significance:** The Chowan River and Albemarle Sound also experienced bluegreen blooms during the summers of 2015 and 2016. *Dolichospermum*, like most filamentous bluegreens, can grow quickly in summer when the daylight is more intense and temperatures are higher. Bluegreen algae are known to form blooms that discolor water and may cause taste and odor problems. Some bluegreens, such as *Dolichospermum*, may produce cyanotoxins. These blooms are commonly referred to as potential harmful algal blooms (pHABs) and can cause illnesses in humans and have been attributed to the death of pets and livestock. Fortunately, no human or animal illnesses have been attributed to pHABs in NC.

**Table 1.** Physical parameters of Edenhouse and Edenton Bay locations

Location	Time	Cond (µS/cm)	Temp (C°)	DO (mg/L)	pH (su)
Edenhouse	12:14 PM	95	30.1	12.5 (164%)	8.9
Edenton Bay	12:47 PM	105	30.6	12.8 (169%)	9.4

**Table 2.** Algal densities and biovolume of Edenhouse, Edenton Bay, and Pembroke Creek samples

Location	Dominant Algae	Cell density (cells/ml)	Unit density (units/ml)	Biovolume (mm <sup>3</sup> /m <sup>3</sup> )
Edenhouse	<i>Dolichospermum</i>	80,400	4,500	7,000
Edenton Bay	<i>Dolichospermum</i>	239,700	23,800	28,500
Pembroke	<i>Dolichospermum</i>	611,700	19,000	57,000



Figure 2: *Dolichospermum planktonicum*



Figure 3: *Dolichospermum spiroides*

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