How oyster spatfall prediction is carried out in Caraquet Bay

It is important to know the oyster spatfall date as precisely as possible in order to synchronize the set-up of the collectors with the presence of eyed larvae to maximize spat collection. If the collectors are placed in the water too early before spawning occurs, they can become covered in undesirable biofouling, which could prevent the spat from attaching to the collectors. If the collectors are placed in the water too late, it could lead to little or no spat being collected.

Oyster spatfall prediction involves several important stages to help determine the date on which the oyster larvae will attach to the collectors. Those stages are as follows:

Gonad observation
Monitoring of larvae in plankton
Observation of attachment to sea scallop shells
Evaluation of attachment to the collectors

Gonad observation

This stage usually begins on the first Monday in June. Three samples of 10 oysters are taken from three different sites in Caraquet Bay. These sites correspond to stations 1, 2, and 3, and are identified by metal rods planted in the sediment, which also serve as visual markers (a map showing the sample stations in Caraquet Bay is included in Appendix 1). Samples are taken twice a week, on Mondays and Fridays. Gonadic development can be tracked by consulting the Oyster spat collection updates on the Department's website. Updates are presented in the form of a table.

Once the oysters release their gametes (ova or sperm), it is highly recommended that the collectors be limed. The Department then issues a notice indicating the date on which this should be done.

Monitoring of larvae in plankton

Monitoring begins once there is significant spawning; this means that within 24 hours, swimming oyster larvae are visible in the water samples. Once the larvae are identified in the plankton, the biologists take samples every two days, i.e. on Mondays, Wednesdays, and Fridays. They drag a plankton net with a 60-micron mesh for five minutes at a very slow speed behind the boat and collect the sample in a flask. They also change the sea scallop shells on the monitors. These shells are used to track spat collection. The oysters' first mobile larval stage is D-shaped and measures approximately 75 microns. Larvae of more than 300 microns will try to settle on a calcareous substrate. Oyster larvae can grow 20 microns per day and even faster in optimal climate conditions. The Oyster spat collection updates provide information on the larval development in a table format.

When larvae measuring more than 300 microns with a distinctive black dot are observed, they are called “eyed larvae”. Once they reach this stage, they look for a calcareous substrate where they can settle; collectors must then be placed in the water. The Department issues a notice indicating the date on which it is recommended that collectors be placed in the water in Caraquet Bay.

Observation of attachment to sea scallop shells

Examining the shells helps confirm the density of oyster settlement. The sea scallop shells are changed every five days. They are taken to the laboratory for observation. The amount of oyster spat collected is counted and recorded in a table.

Evaluation of attachment to the collectors

This stage occurs later in the recruitment season when the oyster spat is large enough to be seen with the naked eye. Three Chinese hat collectors are randomly chosen in Caraquet Bay. They are dismantled and every second hat is assessed. The number of oysters covering a 100 cm^2 area on the top and bottom of each hat is counted.

In general, when the collection is good on the Chinese hats, this bodes well for the other types of collectors.

End-of-season report

At the end of the recruitment season, a report is produced on oyster spat collection in Caraquet Bay. It includes a summary of the results, details regarding the methodology used, as well as all data recorded during the exercise. It also contains a table outlining the collection results over the past few decades in Caraquet Bay.

The end-of-season report is available in the Archives section of the web page entitled Oyster spat collection updates.

Information

More information on oyster spat collection in Caraquet Bay is available by contacting the biologists of the Department’s regional team in Shippagan at 506-336-3751.

Appendix 1: Sampling stations in Caraquet Bay