

**NORTHEAST CONSORTIUM
SEMI-ANNUAL REPORT**

For period July 1, 2009 – December 31, 2009

1. Project title and contract number

Exploring the potential inadvertent effects of Gulf of Maine and Georges Bank area closures on cod life-history variation

Prime Award No. NA06NMF4720095

Subaward No. 08-008

2. PI contact information

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4. Project objectives

The primary objectives of this project are as follows:

- 1) Demonstrate the existence of life-history variants (i.e. ecotypes or morphotypes) in Atlantic cod from the Gulf of Maine and Georges Bank.

- 2) Examine whether Gulf of Maine and Georges Bank closed areas favor sedentary cod types over migrant cod types.
- 3) Examine whether closed areas alter cod feeding and growth.

5. Major accomplishments and milestones (last 6 months)

Since beginning sampling in summer of 2007, we have made great progress towards achieving these objectives. The following is a list of milestones and accomplishments for this project achieved over the last 6 months:

- 1) An additional 8 charter days were carried out to sample at Cashes Ledge and in midcoast Maine for red and normal cod.
- 2) The total number of cod sampled now stands at 1,392. All of these have been processed for the following:
 - a. Length, weight, liver weight, gonad weight, gutted weight
 - b. Sex
 - c. Age (from otoliths)
 - d. Photos for morphometric analyses
 - e. Color; we have developed a red/green ratio (RGR) measurement from digital images as a robust way of quantifying color in cod
 - f. Stable carbon and nitrogen isotope signatures (subset of 307 cod)
 - g. Diet (from stomach contents)
 - h. Parasite loads
- 3) An in-depth analysis of red versus normal (olive) colored cod has been completed, presented at the ICES Annual conference in Berlin, and submitted to the ICES Journal of Marine Science as a contribution to a special session on life-history variability in fish. This manuscript included updated analyses of diet and morphometric differences between red and olive cod.

5. Unexpected difficulties and project alterations

No major difficulties have been encountered and no alterations have been made to our work plan (other than continued directed sampling for red cod) since submission of the previous annual report.

6. Next steps, tasks for next 6 months

- 1) Complete field sampling: funds remain for 3 charter days to be completed. This will allow us to complete 1-2 more trip(s) to Cashes Ledge.
- 2) Analyze all data to test for effect of closure status on cod life-history, feeding and growth.
- 3) Write final report and submit second manuscript to the primary literature.

7. Signature and date



Graham Sherwood

January 15, 2010