

**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**



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Graham Sherwood

January 15, 2010