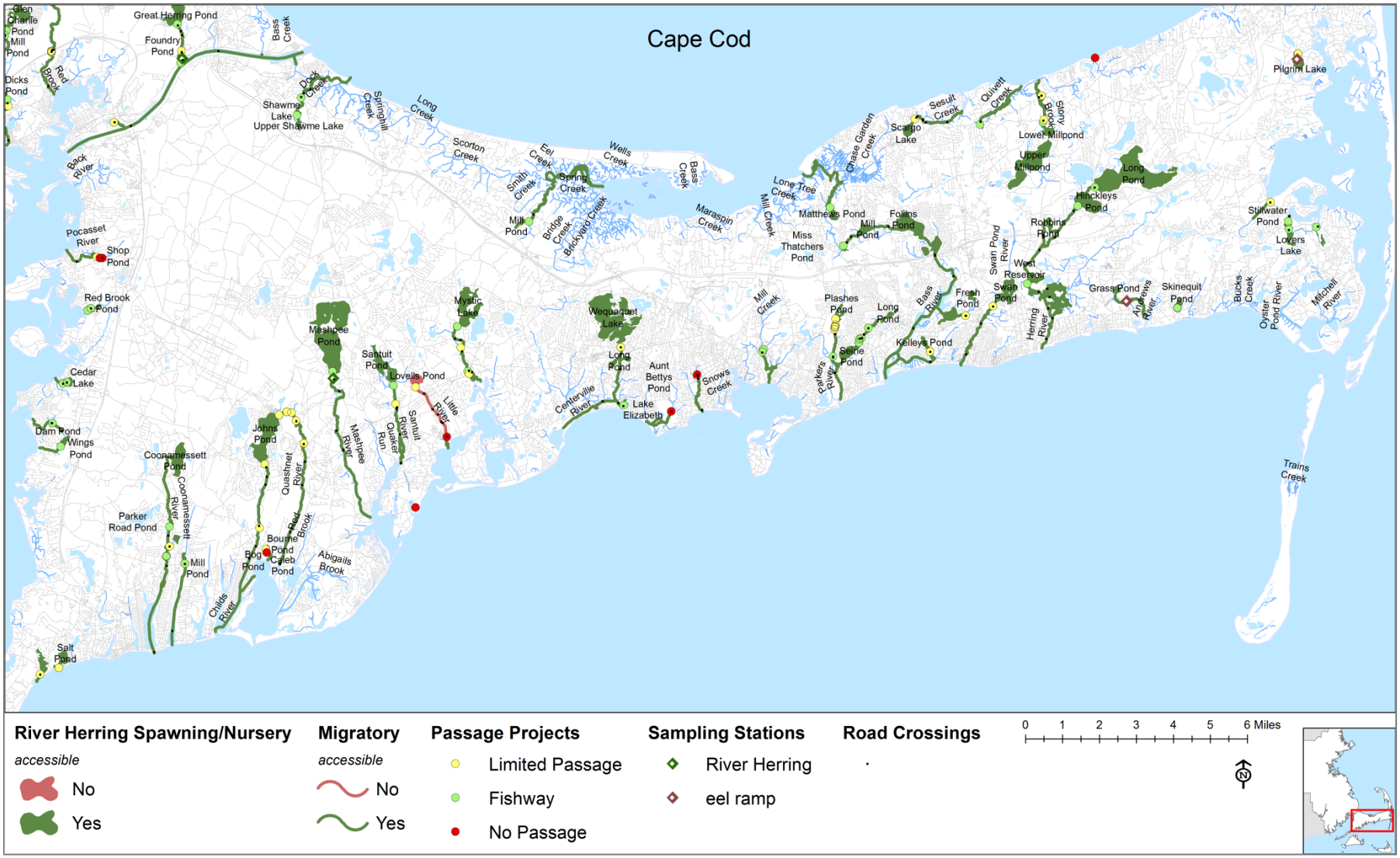
Massachusetts
Environmental monitoring related to river herring

1. QAPP for diadromous fish habitat
2. Water temperature loggers
3. Environmental data related to spawning runs
4. Precipitation model on river herring recruitment

MarineFisheries
Commonwealth of Massachusetts



River Herring Spawning/Nursery

accessible

- No
- Yes

Migratory

accessible

- No
- Yes

Passage Projects

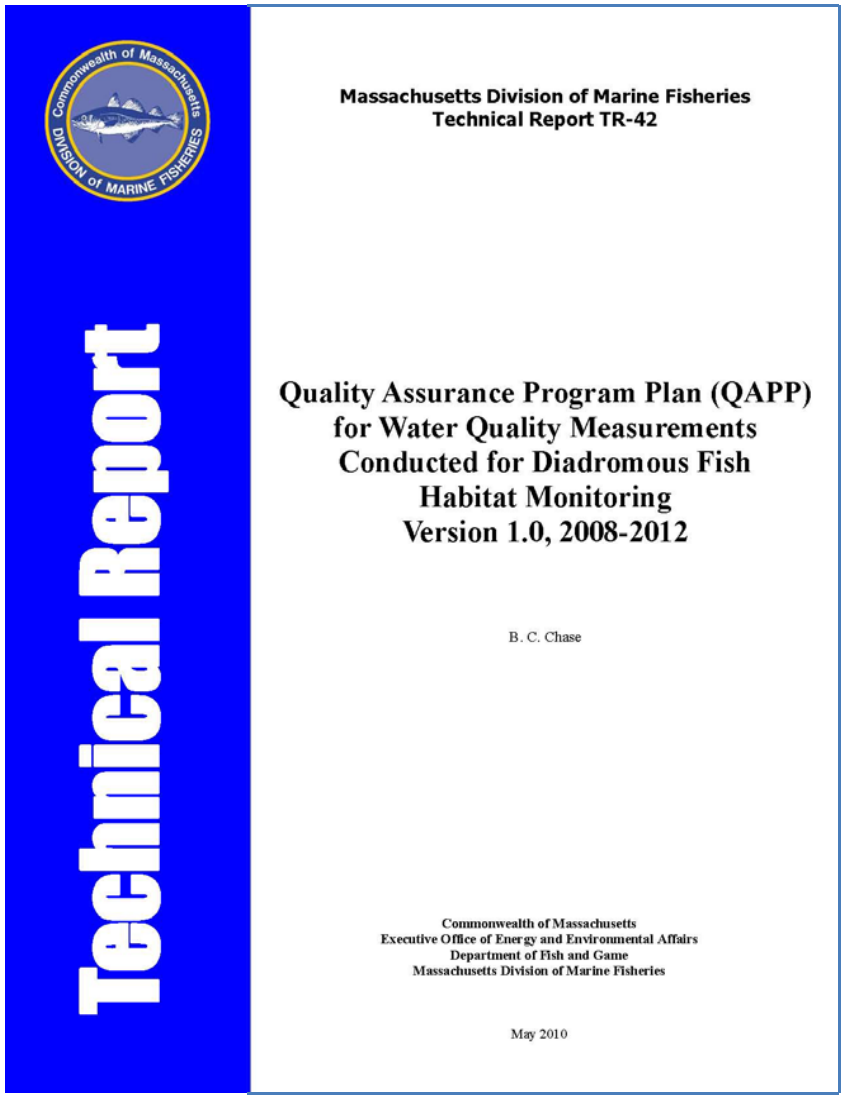
- Limited Passage
- Fishway
- No Passage

Sampling Stations

- River Herring
- eel ramp

Road Crossings

http://www.mass.gov/dfwele/dmf/publications/technical.htm


Technical Report

Massachusetts Division of Marine Fisheries
Technical Report TR-42

Quality Assurance Program Plan (QAPP)
for Water Quality Measurements
Conducted for Diadromous Fish
Habitat Monitoring
Version 1.0, 2008-2012

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Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
Department of Fish and Game
Massachusetts Division of Marine Fisheries

May 2010

Standard Operating Procedures

1.0 Water temperature loggers

2.0 Water chemistry multi-probe sondes

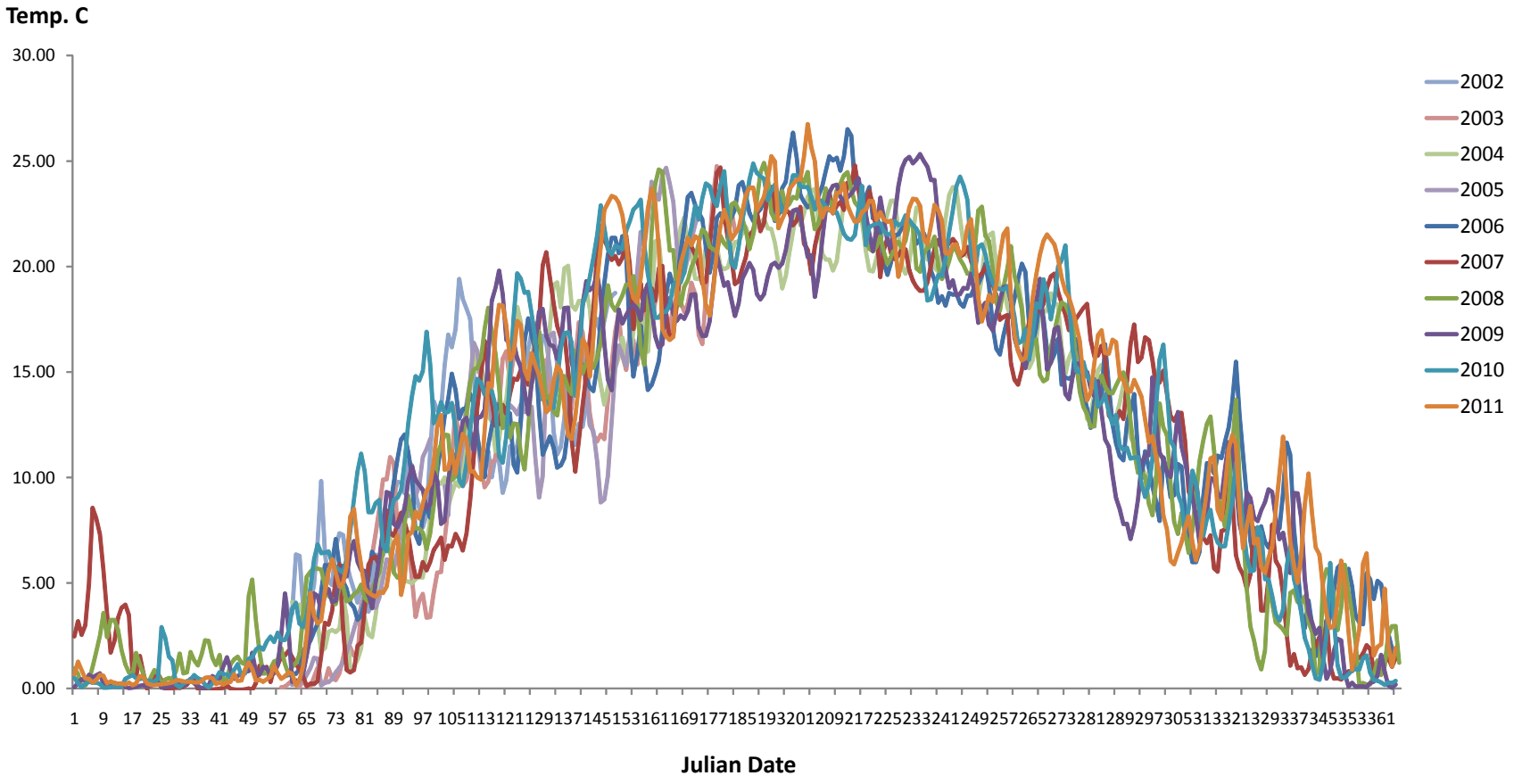
3.0 Rainbow smelt spawning habitat

4.0 River herring spawning and nursery habitat

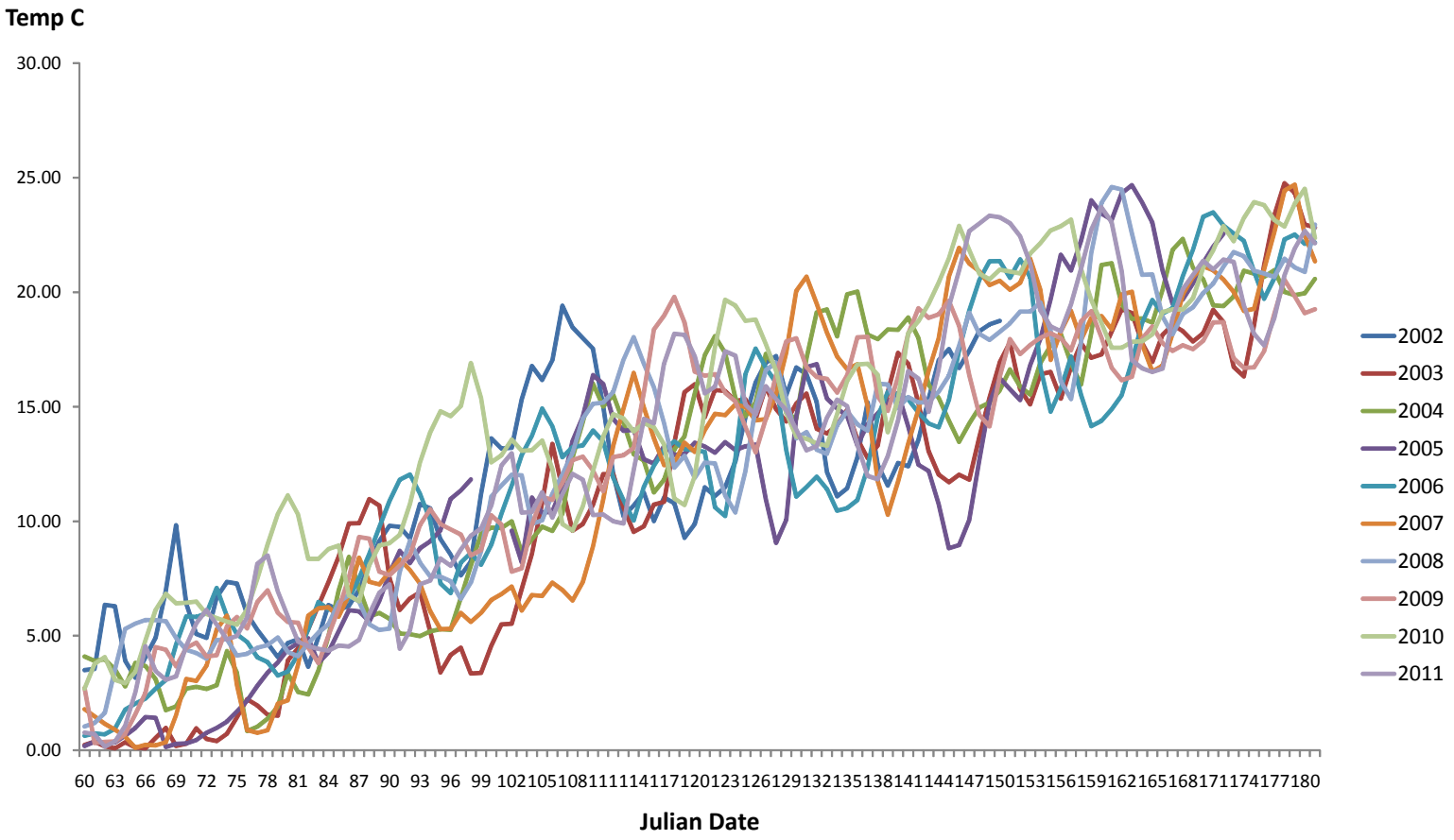
Table 4.1 Physical, Chemical and Biotic Criteria used for River Herring Spawning and Nursery Habitat.

Variables	Suitable (SWQC or BPJ)	Minimally Impacted (25th percentile)	Notes/Source
REFERENCE			
Temperature (°C) (July-Oct.- nursery)	≤ 28.3		Maximum limit (*Mass*DEP 2007)
Temperature (°C) (May/June spawning)	≤ 26.0		Scientific literature and BPJ
Temperature (°C) (May/June spawning)	≤ 20.0 (7-day mean)		7-day mean of daily max. from logger data (*Mass*DEP 2007)
pH	≥ 6.5 to ≤ 8.3		(*Mass*DEP 2007)
DO (mg/L)	≥ 5.0		(*Mass*DEP 2007)
Secchi disc (m)		≤ 2.0	75th percentile; EPA Ecoregion 14, sub-84 (US EPA 2000c)
Turbidity (NTU)		≤ 1.7 (rivers only)	EPA Ecoregion 14, sub-59 (US EPA 2000b)
TN (mg/L)		≤ 0.32	EPA Ecoregion 14, sub-59 (US EPA 2000c)
TP (ug/L)		≤ 8.0	EPA Ecoregion 14, sub-59 (US EPA 2000c)
Chlorophyll *a* (ug/L)		≤ 4.2	EPA Ecoregion 14, sub-59 (US EPA 2000c)
QUALITATIVE			
Fish Passage	BPJ		SOP Section 4.0
Stream Flow	BPJ		SOP Section 4.0
Eutrophication	BPJ		SOP Section 4.0

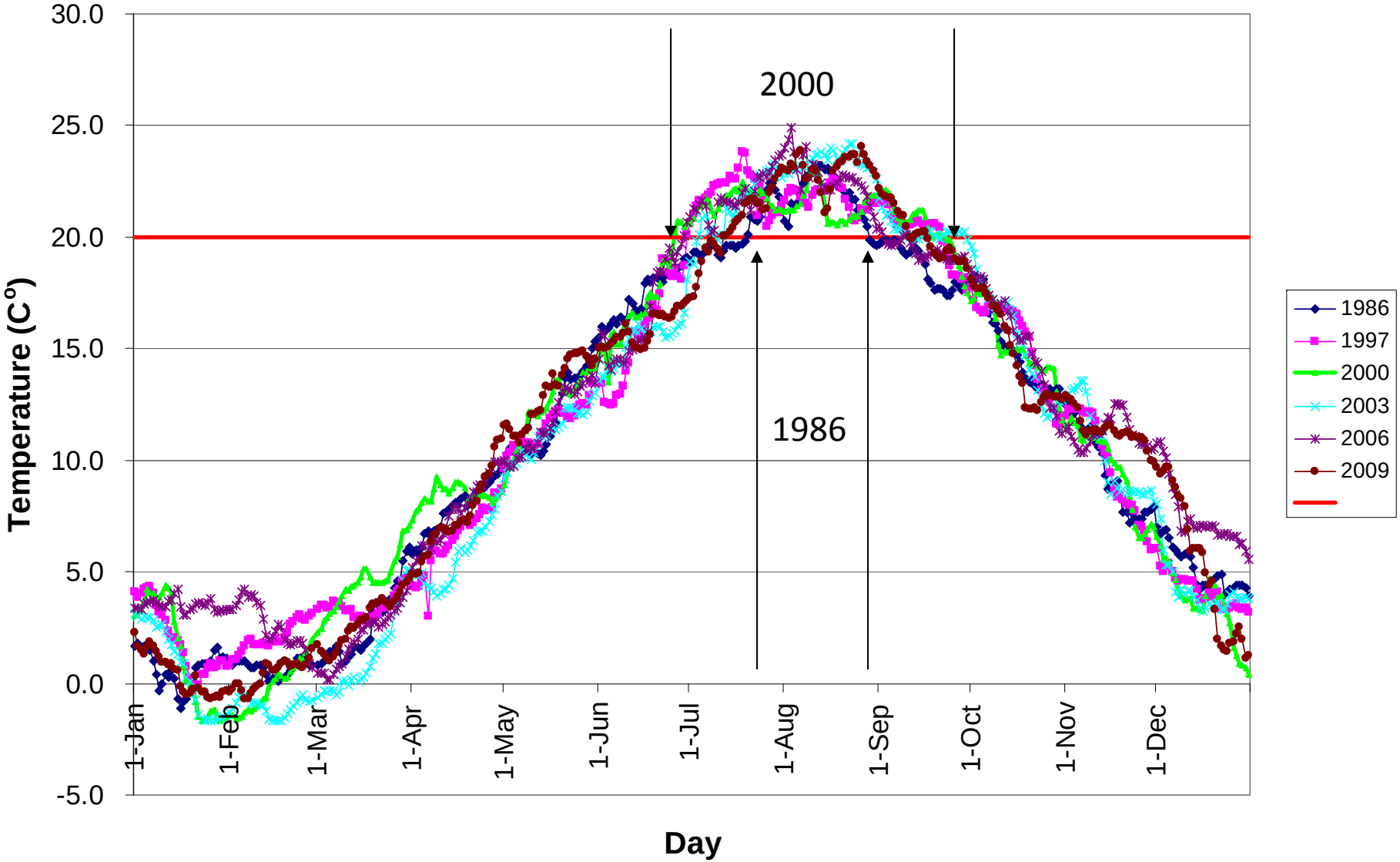
Fore River annual water temperature, 2002-2011

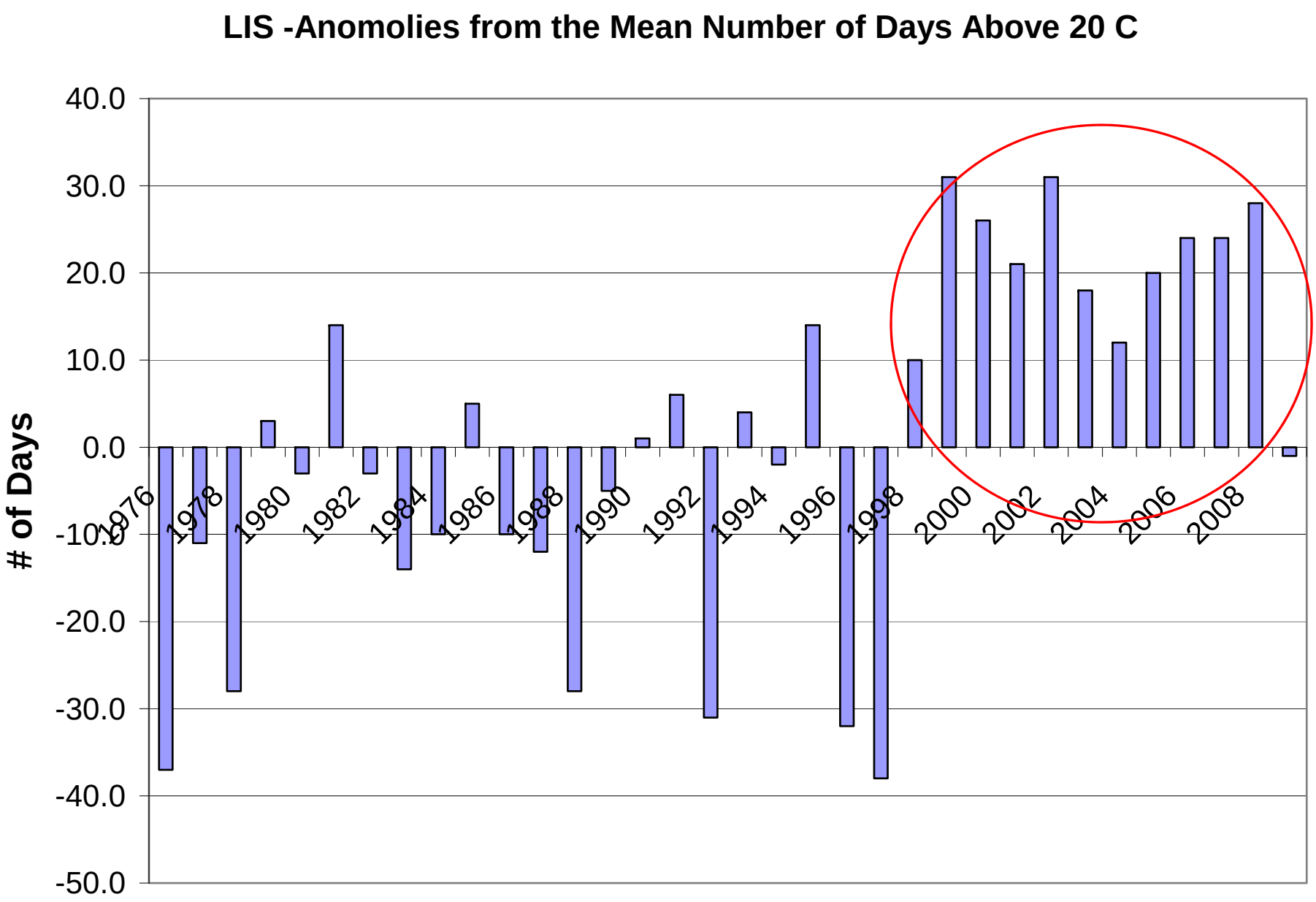


Fore River spring water temperature, 2002-2011

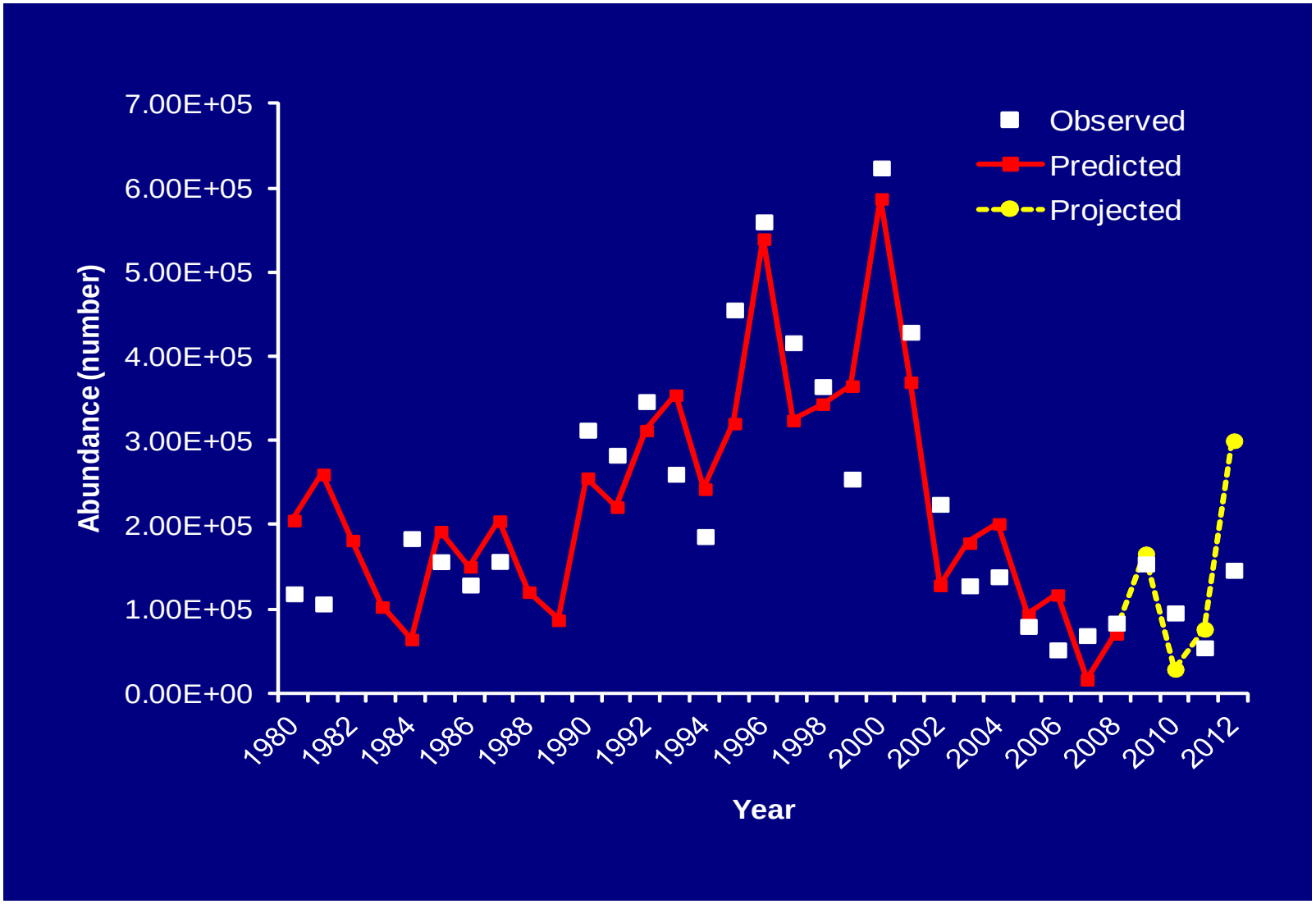


Buzzards Bay marine water temperature




LIS -Anomolies from the Mean Number of Days Above 20 C
# of Days
40.0
30.0
20.0
10.0
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008

Multiple Regression Model: Precipitation effect on Spawning Run Recruitment at Monument River, MA



Next Steps.

- river herring habitat assessments
- Evaluate life history thresholds from data distributions and scientific literature
- Continue to analyze environmental influences on spawning run abundance and recruitment
- Fishway O&M initiative