

David T. Goethel  
23 Ridgeview Terrace  
Hampton, NH 03842

March 3, 2013

Mr. Rip Cunningham  
Chair, NEFMC  
50 Water Street  
Newburyport, MA

Dear Mr. Cunningham,

Recently, I sent the council six peer reviewed scientific journal articles regarding the impact of warming water temperatures on biological reference points and rebuilding timelines for Atlantic cod stocks. My literature review was directly aided by scientists that listened to the council broadcast, agreed with my statement of the problem, and guided me to research articles on climate change impacts for marine fish distribution and biology. After two weeks of research I narrowed the list of publications to these six because they best illustrated the current issues. The articles lead to several general conclusions: 1) Stocks rebuild in environmental and ecological time based on natural changes in community structure and the interplay with a dynamic climate, which occurs with or without fishery management, and certainly does not and cannot adhere to legislative-based ten year rebuilding periods; 2) In warm water regimes near the southern extent of a cold water species range, some stocks cannot rebuild to targets based on an obsolete understanding of stock productivity, even under a fishing moratorium, until the regime reverts back to its normal colder state; 3) Due to declines in productivity caused by warming water temperatures, biological reference points (BRPs) for cold water stocks will be considerably lower when water temperatures rise, which must be accounted for by recalculating biomass targets based on current climactic conditions; 4) Reference points should be calculated on an ecosystem basis, not a single species one.

Overall, these papers demonstrate that the current management program will guarantee the destruction of the groundfish fleet with negligible benefits to the fish. As such, I feel strongly that we must reconsider our actions and develop an alternative way forward at the upcoming April council meeting. The remainder of this letter is a list of action items which I believe the *entire* council should debate in April. The implications of our current decisions are too important to be dealt with by less than the *full* council.

- 1) The council should draft a letter to Congress, signed by the chairman, regional administrator, and director of the science center requesting temporary relief from the ten year rebuilding requirement in the Magnuson-Stevens Reauthorization Act. The letter should cite the exigent environmental circumstances that have occurred off the New England coast resulting in the inability to meet rebuilding targets in legislatively defined timeframes (Drinkwater, 2005; Rothschild, 2007; Fogarty *et al.*, 2008; Devine and Haedrich, 2011). Relief should be granted until such time as water temperatures return to normal. I would define normal as two consecutive years at or below the long term average as determined by a temperature time series such as the one kept by the Bigelow Laboratory in East Boothbay, Maine.
- 2) The council should request that the appropriate group (e.g., SSC, PDT, or NEFSC) calculate a new set of reference points for the current warm water regime. It has been widely documented that unfavorable environmental conditions reduce productivity, increase mortality, and result in a negative impact on cod biomass irrespective of fishing mortality (Drinkwater, 2005; Rothschild, 2007; Fogarty *et al.*, 2008). Thus, since key input parameters for models that calculate biological reference points have changed (e.g., productivity declines and mortality increases), a reassessment of biomass targets is warranted. Also, there is no reason to believe the other groundfish stocks have not been similarly impacted, which indicates that similar recalculations are necessary for all overfished stocks. A secondary objective, completed over a longer time frame, should be to perform a full reassessment of BRPs on all New England stocks in order to identify high and low productivity regime reference points. After such calculations are completed, the SSC should be required to calculate new ABC's and ACL's, which are implemented by interim action until such time as the council can complete a framework to implement them for the remainder of the 2013-2015 time period.
- 3) Recognizing that the above calculations will take some time to complete, the question becomes what to do about ACL's for 2013. When the reference points change the status of the stock will change. Some will remain overfished but others may not. Similarly some stocks may no longer be behind rebuilding trajectories. For these reasons I believe it is imperative that NMFS implement interim action to reduce overfishing on all stocks (GOMcod, GB cod, GOM haddock, CC yellowtail, GB yellowtail, witch flounder and plaice) based on the F rates for the actual 2012 catch. These

would remain in effect until the new reference points and ACL's could be implemented by council framework for the remainder of 2013-2015. Justification for interim action for a second year on cod and other species for a first year is the time necessary to complete these calculations and the fact that this is a new event not contemplated in previous council actions.

- 4) I request that the council move forward with an amendment to immediately set multispecies reference points in the groundfish fishery. New England groundfish management has not been successful throughout the history of federal fishery management. Although the reasons for this are many and varied, I believe the chief factor is single species management of a multispecies complex. Link *et al.* (2012) confirm this by stating: “Continuing to estimate S[ingle]S[pecies] yields still has its place, but doing so without recognizing the system-level limitations and aggregated properties of a fished community is ***no longer defensible***” (p. 300; emphasis added). Extensive research has looked into the tradeoff between managing for single species biomass targets and ecosystem-wide maximum sustainable yield (e.g., Collie and Gislason, 2001; Mace, 2001; Hilborn *et al.*, 2004; Mackinson *et al.*, 2009). The general conclusion from these studies is that single species targets are not achievable simultaneously without extreme foregone yield (Hilborn *et al.*, 2004; Mackinson *et al.*, 2009). Only after multispecies interactions are directly incorporated into biological reference point targets through the development of ecosystem-based MSY can a realistic, rational management plan for groundfish be achieved.
- 5) I would request that a research track be established as soon as possible to map changes in spawning sites and general distribution of all groundfish throughout New England, and to explore what these changes will mean for long term yields from the fishery. Lough (2010) demonstrates the importance of larvae being entrained in the current gyre on George's Bank. If cod spawn in water on the shoulders of the bank larvae will not be entrained, settlement will not occur on the appropriate gravel substrates, and recruitment will be poor. Similarly, Huret *et al.* (2007) and Churchill *et al.* (2011) demonstrate that recruitment success of Gulf of Maine cod is directly associated with the timing and location of spawning in relation to the Gulf of Maine coastal current. Considering that many fishermen along with NEFSC surveys confirm that many fish, especially cod and yellowtail, are moving to deeper water to spawn in the current warm water regime, it is imperative that we determine what such distributional changes imply for future production.

- 6) In the event that the Council and or agency feel that any of the items referenced in the above bullets fall outside of current legal authority, I request that those items be included in the letter to Congress referenced in bullet one. This letter should request that Congress, either enact the items directly, or enact legislation that gives authority to the Council and or agency to enact them.

I realize that this letter requires massive amounts of work, manpower, and resources. However, I cannot sit idly by and watch the inshore fleet in the Gulf of Maine be completely destroyed, the recreational fishery nearly destroyed, and a large segment of the offshore fleet eliminated with the balance severely hobbled. The massive and substantial action that I am requesting is simply in line with the severity of the situation. Contrary to popular opinion, eliminating fishing does nothing to solve the underlying environmental problem. It only guarantees that this nation will have to expend vast amounts of money in the future to reconstitute a groundfish fleet and its associated infrastructure. You need look no further than the swordfish industry where, through excessive regulation, the fleet was almost completely eliminated. Now the United States government is frantically trying to reconstitute the fleet to keep from losing its share of quota to other countries. We must take action to preserve the remnants of our groundfish fleet now or risk losing it forever.

Finally, by way of this letter, I am asking that proper notice be given on the April council meeting agenda and in the federal register so that the public is properly notified. I plan to bring numerous motions to the council based on the contents of this letter.

Sincerely,



David T. Goethel

#### References

- Collie, J. S., Gislason, H. 2001. Biological reference points for fish stocks in a multispecies context. *Can. J. Fish. Aquat. Sci.* 58, 2167-2176.
- Devine, J. A., and Haedrich, R. L. 2011. The role of environmental conditions and exploitation in determining dynamics of redfish

- (*Sebastes* species) in the northwest Atlantic. *Fish. Oceanogr.* 20, 66-81.
- Drinkwater, K. F. 2005. The response of Atlantic cod (*Gadus morhua*) to future climate change. *ICES J. Mar. Sci.* 62, 1327-1337.
- Fogarty, M., Incze, L., Hayhoe, K., Mountain, D., Manning, J. 2008. Potential climate change impacts on Atlantic cod (*Gadus morhua*) off the northeastern USA. *Mitig. Adapt. Strat. Glob. Change.* 13, 453-466.
- Hilborn, R., Punt, A. E., Orensanz, J. 2004. Beyond band-aids in fisheries management: Fixing world fisheries. *Bull. Mar. Sci.* 74 (3), 493-507.
- Link, J. S., Gaichas, S., Miller, T. J., Essington, T., Bundy, A., Boldt, J., Drinkwater, K. F., Moksness, E. 2012. Synthesizing lessons learned from comparing fisheries production in 13 northern hemisphere ecosystems: emergent fundamental features. *Mar. Ecol. Prog. Ser.* 459, 293-302.
- Lough, R. G. 2010. Juvenile cod (*Gadus morhua*) mortality and the importance of bottom sediment type to recruitment on Georges Bank. *Fish. Oceanogr.* 19 (2), 159-181.
- Mace, P. M. 2001. A new role for MSY in single-species and ecosystem approaches to fisheries stock assessment and management. *Fish Fish.* 2, 2-32.
- Mackinson, S., Deas, B., Beveridge, D., Casey, J. 2009. Mixed-fishery or ecosystem conundrum? Multispecies considerations inform thinking on long-term management of North Sea demersal stocks. *Can. J. Aquat. Fish. Sci.* 66, 1107-1129.
- Rothschild, B. J. 2007. Coherence of Atlantic cod stock dynamics in the Northwest Atlantic Ocean. *T. Am. Fish. Soc.* 136, 858-874.