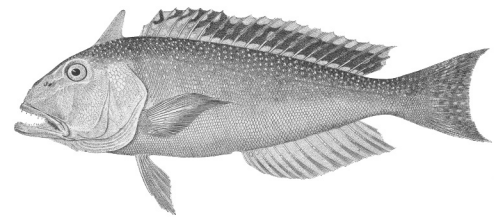


CATCH SHARES IN ACTION

United States Mid-Atlantic Golden Tilefish Individual Fishing Quota Program



AUTHOR

Sarah E. Poon

CONTRIBUTOR

José Montañez

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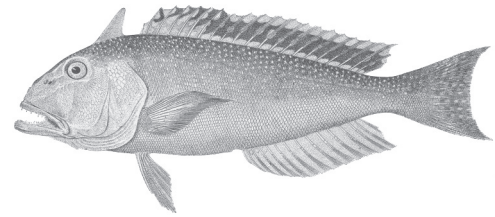


SEASALT

- Secure
- Exclusive
- All sources
- Scaled
- Accountable
- Limited
- Transferable

CATCH SHARES IN ACTION

United States Mid-Atlantic Golden Tilefish Individual Fishing Quota Program



SPECIAL DESIGN FEATURES



SINGLE-SPECIES, INDIVIDUALLY-ALLOCATED,
QUOTA-BASED, TRANSFERABLE

Established in 2009, the United States Mid-Atlantic Golden Tilefish Individual Fishing Quota (IFQ) Program is a catch share program that has minimized the complexity of fishery management to create a usable, efficient system for fishermen and fishery managers. The program was implemented following the innovative self-organization of some fishery participants into an IFQ-like cooperative, which demonstrated the potential benefits of an IFQ. The goals of the IFQ program were focused on rebuilding the tilefish stock through overcapacity reduction and elimination of problems associated with derby-style fishing. Key design features include a discard prohibition and incidental tilefish catch limit for non-IFQ vessels to ensure all sources of tilefish fishing mortality are accounted for.

In November 2009, managers implemented an IFQ program for the U.S. golden tilefish (*Lopholatilus chamaeleonticeps*) fishery in southern New England and the Mid-Atlantic region. It was the first catch share program for the tilefish fishery and the second catch share program to be implemented in the U.S. Northeast (NOAA Fisheries Service, 2009a).

Golden tilefish habitat ranges from Nova Scotia to South America. The Mid-Atlantic Fishery Management Council (MAFMC) manages the Tilefish Management Unit, defined as the stock in U.S. Atlantic waters north of the Virginia-North Carolina border. Currently, the majority of tilefish is landed in Montauk, New York, but fleets in other ports within the region also play an important role in the commercial fishery. Commercial catch is primarily by longline gear, but a small amount of tilefish is caught incidentally by otter trawls and gillnets.

Between 2001 and 2009, prior to IFQ implementation, annual commercial landings ranged between 676 and 1,215 metric tons, and the average value was U.S. \$3.9 million (NOAA Fisheries Service, 2011; Mid-Atlantic Fishery Management Council, 2013). The fishery has historically been comprised of a small number of participants, and only 13 IFQ permits were issued upon implementation of the program for the 2010 fishing year (NOAA Fisheries Service, 2010).

SYNOPSIS

Road to a Catch Share

The tilefish fishery, dating back to the late 1800s, has historically been fished by longline and trawl gear. In the years following World War II, the fishery was dominated by otter trawls, but low prices and high competition with foreign vessels caused reduced domestic tilefish fishing activity. In the 1970s, the longline fishery grew, and tilefish has since been primarily harvested by bottom longline gear (Mid-Atlantic Fishery Management Council, 2000). Annual commercial tilefish landings were less than 125 metric tons in the late 1960s and early 1970s, but increased rapidly to more than 3,800 metric tons in 1979 and 1980 (Nitschke, 2006). Landings fluctuated over the next decade, with an overall declining trend.

A 1998 stock assessment revealed the golden tilefish stock was overfished and that overfishing was still occurring (Nitschke et al., 1999; Mid-Atlantic Fishery Management Council, 2000). In response to the low stock biomass and high fishing mortality reported, as well as the requirements of the 1996 Sustainable Fisheries Act, the MAFMC developed the Golden Tilefish Fishery Management Plan (FMP). Some fishermen hoped the FMP would establish an IFQ program, but a Congressional moratorium prohibited implementation of new IFQ programs at that time (Kitts et al., 2007).

The FMP was implemented in 2001 and included a 10-year stock rebuilding plan with provisions for limited entry, a commercial catch limit and trip limits for incidental tilefish catch (Mid-Atlantic Fishery Management Council, 2000). The catch limit, or total allowable catch, was divided between four fishing categories—two full-time fishing categories (Categories A and B), one part-time category (C) and an incidental catch category—based on each category's historical landings. The catch limit had a positive impact on the stock, and stock assessments in 2005 and 2008 indicated the stock was rebuilding (National Marine Fisheries Service, 2009). Landings values per pound generally increased.

While the catch limit benefited the tilefish stock, it also introduced challenges for fishermen. The new regulations heightened competition between fishermen to catch as much fish as possible before the annual limit was reached. Derby-style fishing led to fishing in unsafe conditions and early fishery closures, which limited the ability of fishermen in some categories to generate revenue. Category B closed early each year from 2005 to 2009, and Category C closed early in 2002 and from 2004 through 2009 (NOAA Fisheries Service, n.d.; Mid-Atlantic Fishery Management Council, 2008). Landings exceeded the catch limit by 25% in 2003 and by 34% in 2004 (Nitschke, 2006).

Despite these consequences, the catch limit facilitated a beneficial cooperative agreement among fishermen in Category A. Members of Category A, the primary full-time fleet located in Montauk, N.Y., developed an informal agreement to make the most efficient use of their portion of the catch limit. To avoid derby-style fishing, members divided the category's share based on each fisherman's historical landings (Kitts et al., 2007). This cooperation was facilitated by the fishermen's close proximity to one another, their strong personal relationships and their ability to share a designated portion of the allowable landings. As a result of their

cooperative agreement, fishermen in the category benefited from safer fishing conditions, improved stability for their businesses and higher market prices for their fish (Kitts et al., 2007). Their success in improving fishing conditions prompted increased interest in an IFQ program among fishery participants.

In 2008, following years of planning, the MAFMC established the Golden Tilefish IFQ for Categories A, B and C through an amendment to the FMP (Mid-Atlantic Fishery Management Council, 2008). The IFQ was formally implemented in November 2009, which marked the beginning of the 2010 fishing year. Managers hoped the IFQ would eliminate problems associated with the race for fish that occurred under the initial catch limit system.

Performance

A primary goal of the Golden Tilefish IFQ Program was to eliminate the unsafe and inefficient derby-style fishing that occurred after the catch limit was introduced. In the four years since launching the IFQ program, the fishery has shown signs of improvement. The fishery is open year-round for all IFQ participants, eliminating incentives for derby-style fishing. Vessels are generally taking fewer and shorter trips to catch the same amount of fish, indicating increased efficiency and reduced costs. Individual allocations allow flexibility in the timing of landings, and fishermen report receiving a higher price per pound for tilefish (J. Montañez, personal communication, 2011).

STEP 1 IN ACTION

Define Program Goals

The 2001 FMP identified four main objectives to meet the goal of rebuilding the tilefish stock (Mid-Atlantic Fishery Management Council, 2000):

- Prevent overfishing and rebuild the resource to the biomass that would support maximum sustainable yield
- Prevent overcapitalization and limit new entrants
- Identify and describe essential tilefish habitat
- Collect necessary data to develop, monitor and assess biological, economic and social impacts of management measures designed to prevent overfishing and to reduce bycatch in all fisheries

The MAFMC implemented the IFQ program in 2009 in an effort to reduce overcapacity in the fishery and to eliminate problems associated with derby-style fishing. Specifically, managers expected that the IFQ program could improve safety, increase profits, eliminate early closures and reduce discards, and meeting these goals would ultimately assist the fishery in achieving sustainable harvest (Mid-Atlantic Fishery Management Council, 2008).

STEP 2 IN ACTION

Define and Quantify the Available Resource

Defining and quantifying the available resource was largely driven by pre-existing management structures, as determined by the MAFMC.

The golden tilefish is a long-lived, slow-growing demersal fish species that occupies deep waters of the outer continental shelf along the U.S. East Coast and the Gulf of Mexico. The fishery is managed as a single species because fishermen are able to successfully target tilefish with little overlap with other species. Non-target catch by vessels targeting tilefish is generally less than 2% of the landings, and discards are low. Similarly, discards of tilefish by vessels targeting other species are low (Mid-Atlantic Fishery Management Council, 2000).

The golden tilefish geographical range extends into the South Atlantic and Gulf of Mexico, but the Mid-Atlantic stock is considered to be genetically distinct (Katz et al., 1983). The Tilefish Management Unit is defined by the MAFMC's jurisdiction and includes all U.S. waters north of the Virginia-North Carolina border.

Under the initial FMP in 2001, the catch limit was established based on the results of the 1998 stock assessment (Nitschke et al., 1999). The MAFMC set the limit at 1.995 million pounds (905 metric tons) with the expectation that it would produce a 50% probability of stock recovery to a sustainable biomass level in 10 years. Of the many options considered, this rebuilding plan was expected to have a relatively low impact on landings and revenues in the first few years of implementation (Mid-Atlantic Fishery Management Council, 2000). The catch limit would remain the same for the 10 years following FMP implementation, but could be modified if stock assessments indicated a need for reduction (Mid-Atlantic Fishery Management Council, 2000). Because a 2005 stock assessment showed signs of recovery, the MAFMC decided to maintain the existing catch limit during IFQ implementation (Mid-Atlantic Fishery Management Council, 2008).

STEP 3 IN ACTION

Define Eligible Participants

The original FMP implemented in 2001 allocated portions of the catch limit to the four fishing categories—two full-time, one part-time and one incidental—but did not indicate how it should be divided between vessel owners in each category. The IFQ Program built off the FMP by allocating a portion of each category's catch to individual fishermen. The primary goal for this was to eliminate the derby-style fishing that occurred in some fishing categories (Mid-Atlantic Fishery Management Council, 2008).

Tilefish IFQ Allocation Permits were issued to individuals or entities with recent history in the tilefish fishery (NOAA Fisheries Service, 2009a). Fishermen were eligible if they held limited access permits in 2005 and reported landings greater than 0.5% of the average total landings for their tilefish category from 2001 to 2005 (NOAA Fisheries Service, 2009a). Fishermen not participating in the IFQ program were allowed an incidental catch of up to 300 pounds per trip under an open access permit. This ensured that small amounts of tilefish caught by vessels targeting other species could be retained rather than discarded.

The fishery had a small number of participants prior to IFQ implementation. The program's design reflects this characteristic as well as the stated goal of reducing overcapacity. Because of the low number of participants, a small subset of whom brought in the majority of landings, the initial allocation percentages for some shareholders exceeded 20%. The maximum portion of shares any individual or entity may own or hold interest in is 49% (NOAA Fisheries Service, 2009a). While this may seem high, the MAFMC considers it low enough to prevent an individual or entity from having the market power to control tilefish prices (National Oceanic and Atmospheric Administration, 2009). Yet the cap is still large enough to allow flexibility: the two largest shareholders can consolidate, for example, and still not hold more than half of the total shares.

In accordance with the goal to reduce overcapacity and limit new entrants, the MAFMC allowed new participants to enter the IFQ fishery only by buying shares from current participants (Mid-Atlantic Fishery Management Council, 2008).

STEP 4 IN ACTION

Define the Privilege

The IFQ Program issues quota-based privileges to eligible individuals and entities. NMFS allocates IFQ privileges to fishermen in the form of an IFQ Allocation Permit.

The allocation is for the duration of the IFQ program, but permits must be renewed at least once every 10 years under the 2006 reauthorization of the Magnuson-Stevens Fishery Conservation and Management Act (MSA). To comply with this requirement, permits are renewed annually (NOAA Fisheries Service, 2009b). The IFQ program may be modified or discontinued at the discretion of the MAFMC (National Oceanic and Atmospheric Administration, 2009).

An IFQ Allocation Permit grants an individual or entity a percentage of the IFQ catch limit that may be possessed, leased or transferred within the Tilefish Management Unit for each year. Each annual permit also notes the total pounds allowed for the fishing year (NOAA Fisheries Service, 2009b).

An IFQ Allocation Permit may be permanently or temporarily transferred to any eligible U.S. citizen, and the 49% ownership cap is the only limitation on trading (NOAA Fisheries Service, 2009b). Managers originally considered options that would allow selling of shares only to fishery participants. However, the MAFMC ultimately allowed shares to be transferred to any interested party in order to allow a limited number of new entrants into the fishery and to maintain a larger pool of buyers to boost the market price of shares (Mid-Atlantic Fishery Management Council, 2008).

STEP 5 IN ACTION

Assign the Privilege

The initial allocation of shares occurred in late 2009 at the start of the 2010 fishing year. As is typical for catch share programs, the process of determining the initial allocation of shares in the Golden Tilefish IFQ Program was challenging. A number of public comments received during the design process focused on the fairness of

the initial allocation method, particularly with respect to the timeframe on which the allocation should be based (National Oceanic and Atmospheric Administration, 2009).

The MAFMC formally evaluated 20 alternatives for the initial allocation, ultimately deciding to grant a percentage of the catch limit to qualifying individuals or entities based on recent landings (Mid-Atlantic Fishery Management Council, 2008). All existing permits from each category were automatically converted at the end of 2009 to an incidental open access permit, which allowed an incidental catch of up to 300 pounds of tilefish per trip (NOAA Fisheries Service, 2009b). Any current permit holder interested in continuing to land more than 300 pounds of tilefish per trip was required to apply for an IFQ Allocation Permit between August 2009 and February 2010 (NOAA Fisheries Service, 2009b).

To qualify for an IFQ Allocation Permit, an applicant was required to have a vessel with a recent tilefish fishing history, a valid permit in 2005 and average landings of at least 0.5% of their category's average total from 2001 to 2005 (NOAA Fisheries Service, 2009b).

Vessel owners who were denied an IFQ Allocation Permit or who disputed the allocation amount had 30 days to submit a written appeal. Appeals were reviewed in a hearing, and appellants could receive authorization from the NMFS Regional Administrator to fish under the IFQ during the appeals process (NOAA Fisheries Service, 2009b). Two appeals were filed following the initial allocation, but they were denied because the eligibility requirements were not met (J. Montañez, personal communication, 2011).

For the initial allocation of permits, 3% of the catch limit was set aside for research, 5% was allocated to the incidental catch category and 15% was set aside for appeals resolution. The remaining 77% was distributed between the full-time and part-time fishing categories based on recent landings, with 66% of the adjusted limit allocated to Category A, 15% to Category B and 19% to Category C (NOAA Fisheries Service, 2009b).

Each vessel owner was then allocated a portion of their category's catch limit. For Categories A and B, qualified applicants received an allocation proportional to their reported landings between 2001 and 2005. Category C (part-time) vessels that landed tilefish during the 2001-2005 time period received an equal allocation of IFQ shares (NOAA Fisheries Service, 2009b).

STEP 6 IN ACTION

Develop Administrative Systems

Permit transfers are authorized and monitored by NMFS. Permanent or temporary transfers occur by submitting an IFQ Allocation Transfer Form. The form details the type of transfer (permanent or temporary), the price received for the transfer and the amount of quota transferred (NOAA Fisheries Service, 2009b).

Catch is monitored through a self-reporting system. IFQ participants must report the total pounds of tilefish landed from each trip via the Interactive Voice Response (IVR) reporting system within 48 hours of docking and unloading the catch. The IVR system allows NMFS to track landings throughout the year and to provide an accurate annual report of landings and their value to each IFQ permit holder (Mid-Atlantic Fishery Management Council, 2008). Fishermen must also keep paper logbook records of each trip. Improvements to the trip logging system are being considered in order to provide managers with better catch-per-unit-effort data (Mid-Atlantic Fishery Management Council, 2008).

Dealer reporting is the primary method for ensuring accurate catch accounting by IFQ participants. Dealers must report all purchases of tilefish, including the pounds of tilefish purchased and the name, permit number and trip identification number of the seller (Mid-Atlantic Fishery Management Council, 2000, 2008). The identification information on dealers' reports facilitates trip-by-trip accounting to ensure accurate reporting of landings weight and value. In addition to this accounting, dockside monitoring and occasional at-sea observers promote compliance with reporting requirements (J. Montañez, personal communication, 2011).

Permit holders are responsible for ensuring they do not exceed their annual allocation. If this occurs, NMFS subtracts the overage amount from the following year's allocation (NOAA Fisheries Service, 2009b).

The annual administrative, monitoring and enforcement cost for the IFQ program is paid collectively by the IFQ permit holders. Each permit holder's annual fee is proportional to the ex-vessel value of his annual landings (NOAA Fisheries Service, 2009b). Under the MSA, the total annual cost recovered by NMFS cannot exceed 3% of the fishery's total ex-vessel value (16 U.S.C 1854). Cost recovery does not include the initial start-up cost for the IFQ, but rather the annual administrative costs that are incurred as a result of the IFQ program (National Marine Fisheries Service, 2011b). In 2010, the total recoverable cost for the IFQ program was U.S. \$21,438, less than 0.5% of the landings value for the year (National Marine Fisheries Service, 2011b).

STEP 7 IN ACTION

Assess Performance and Innovate

The IFQ program is achieving its goal of preventing overfishing in support of stock rebuilding. The catch limit was exceeded by just 2,000 pounds—0.1% of the 1.995 million pound limit—as fishermen and managers adjusted to the new program in 2010. The catch was maintained below the limit in 2011 and 2012 (Mid-Atlantic Fishery Management Council, 2013). IFQ regulations prohibit IFQ participants from discarding tilefish (NOAA Fisheries Service, 2009b), and minimizing discards further supports biological goals. Managers expect the stock to be rebuilt soon, and future stock assessments will provide more insight on the program's success.

The IFQ program has eliminated unsafe and inefficient derby-style fishing, which was a primary program goal. The program allows for year-round fishing, which provides increased stability, flexibility and safety for participants. Flexibility has allowed fishermen to benefit from increased prices. With inflation considered, the average landings value in 2011 was 12% higher per pound than the 2010 average and 24% higher than the 10-year average prior to IFQ implementation (NOAA Fisheries Service, 2011). Total fishery revenue was higher in the 2010 and 2011 fishing years than in the years preceding IFQ implementation (Mid-Atlantic Fishery Management Council, 2013).

A 2011 amendment to the Tilefish FMP established additional accountability measures, including provisions to reduce the total allowable landings in a given fishing year by the amount of the prior year's overage (Mid-Atlantic Fishery Management Council, 2011). The amendment increased the allowable incidental catch to 500 pounds per trip, which is expected to change fishing practices for the managed resource and allow some tilefish that would have been discarded—with assumed 100% mortality—to be retained and sold (J. Montañez, personal communication, 2012). The amendment also gives NMFS authority to prohibit incidental catch for the remainder of a fishing year if the incidental catch is anticipated to exceed the annual limit (5% of the total catch

limit) (Mid-Atlantic Fishery Management Council, 2011). Overall, these additional accountability provisions may help meet the biological and economic goals of the FMP.

In accordance with the MSA, the IFQ program will undergo a formal review within five years of implementation (by November 2014). Subsequent program reviews will coincide with the MAFMC's regular fishery management plan review. Should an interest in modifying the IFQ program emerge, a framework adjustment process established by the FMP would allow managers to make adjustments through a streamlined public review process (Mid-Atlantic Fishery Management Council, 2008). Additionally, the Tilefish Monitoring Committee may recommend catch limit adjustments following stock assessments, which are to occur every three years (Mid-Atlantic Fishery Management Council, 2000).

REFERENCES

- Katz, S. J., Grimes, C. B. and Able, K. W. (1983). Delineation of tilefish, *Lopholatilus chamaeleonticeps*, stocks along the United States East Coast and in the Gulf of Mexico. *Fishery Bulletin*, 81(1), 41-50.
- Kitts, A., Pinto da Silva, P. and Rountree, B. (2007). The evolution of collaborative management in the Northeast USA tilefish fishery. *Marine Policy*, 31, 192-200.
- Magnuson-Stevens Fishery Conservation and Management Act. Title 16 U.S. Code, 1801 et seq.
- Mid-Atlantic Fishery Management Council (2000). *Tilefish fishery management plan, volume I*. Developed in cooperation with the National Marine Fisheries Service. Retrieved from http://static.squarespace.com/static/511cdc7fe4b00307a2628ac6/t/5176d866e4b0e95e599d2670/1366743142476/Tilefish_FMP.pdf
- Mid-Atlantic Fishery Management Council (2008). *Amendment 1 to the Tilefish Fishery Management Plan*. Developed in cooperation with the National Marine Fisheries Service. Retrieved from http://www.mafmc.org/fmp/pdf/Tilefish_Amend_1_Vol_1.pdf
- Mid-Atlantic Fishery Management Council (2011). *Omnibus Amendment*. July 2011. Mid-Atlantic Fishery Management Council in cooperation with the National Marine Fisheries Service. Retrieved from [http://www.nero.noaa.gov/nero/hotnews/OmnibusAmend/ABC_ACL_AM%20Document%20Final%202011-07-26%20\(final-Signed%20FONSI\).pdf](http://www.nero.noaa.gov/nero/hotnews/OmnibusAmend/ABC_ACL_AM%20Document%20Final%202011-07-26%20(final-Signed%20FONSI).pdf)
- Mid-Atlantic Fishery Management Council (2013). *Golden tilefish AP information document*. Developed in cooperation with the National Marine Fisheries Service. Retrieved from [http://static.squarespace.com/static/511cdc7fe4b00307a2628ac6/t/5165da89e4b060cd919344ae/1365629577294/Tilefish%20AP%20Info%2001-18-2013%20\(2\).pdf](http://static.squarespace.com/static/511cdc7fe4b00307a2628ac6/t/5165da89e4b060cd919344ae/1365629577294/Tilefish%20AP%20Info%2001-18-2013%20(2).pdf)
- National Marine Fisheries Service (2009). Assessment of golden tilefish, *Lopholatilus chamaeleonticeps*, in the Middle Atlantic-Southern New England region. *48th SAW assessment report*. National Marine Fisheries Service, Northeast Fisheries Science Center, Southern Demersal Working Group. Retrieved from <http://www.nefsc.noaa.gov/publications/crd/crd0915/pdfs/tilefish.pdf>
- National Marine Fisheries Service (2011a). *Fisheries of the United States—2010. U.S. commercial fishery landings*. NMFS Office of Science and Technology. Retrieved from <http://www.st.nmfs.noaa.gov/st1/fus/fus10/index.html>
- National Marine Fisheries Service (2011b). *2010 Annual report of the tilefish individual fishing quota cost recovery program*. Northeast Regional Office, National Marine Fisheries Service. Retrieved from <http://www.nero.noaa.gov/sfd/TileIFQDocs/2010%20tilefish%20IFQ%20Fee%20Annual%20Report.pdf>
- National Oceanic and Atmospheric Administration (2009). *Magnuson-Stevens Fishery Conservation and Management Act Provisions; Fisheries of the Northeastern United States; Tilefish; Amendment 1*. 74 Fed. Reg. 162. To be coded as 15 CFR Part 902 and 50 CFR Part 648. Retrieved from <http://www.nero.noaa.gov/nero/regs/frdoc/09/09tilefishamend1fr.pdf>
- Nitschke, P. (2006). *Tilefish—status of fishery resources off the northeastern US*. National Oceanic and Atmospheric Administration, Northeast Fisheries Science Center. Retrieved from <http://www.nefsc.noaa.gov/sos/spsyn/og/tile/>
- Nitschke, P., Shepherd, G. and Terceiro, M. (1999). *Assessment of tilefish in the middle Atlantic - southern New England region*. Northeast Fisheries Science Center. Retrieved from http://www.nefsc.noaa.gov/sos/spsyn/og/tile/archives/21_Tilefish_2006.pdf
- NOAA Fisheries Service (n.d.). Weekly quota management report. *National Marine Fisheries Service Northeast Regional Office*. Retrieved October 6, 2011, from http://www.nero.noaa.gov/ro/fso/reports/Quota_Monitoring/QMReportArch.html

- NOAA Fisheries Service (2009a). *Catch share spotlight no. 13: Mid-Atlantic golden tilefish individual fishing quota (IFQ) program*. National Oceanic and Atmospheric Administration. Retrieved from http://www.nmfs.noaa.gov/sfa/domes_fish/catchshare/docs/mid_atlantic_tilefish_ifq_2009.pdf
- NOAA Fisheries Service (2009b). *Amendment 1 to the Tilefish FMP Approved Measures* (p. 9). National Oceanic and Atmospheric Administration. Retrieved from www.nero.noaa.gov/nero/nr/nrdoc/09/09tileamend1phlattach.pdf
- NOAA Fisheries Service (2010). *Tilefish IFQ allocations. February 2, 2010*. National Marine Fisheries Service. Northeast Regional Office. Retrieved from <http://www.nero.noaa.gov/sfd/TileIFQDocs/TileIFQAllocations020210.pdf>
- NOAA Fisheries Service (2011). NMFS commercial fishery landings data. Retrieved May 11, 2013, from <http://www.st.nmfs.noaa.gov/st1/commercial/index.html>
- Rountree, B., Kitts, A. and Pinto da Silva, P. (2008). Complexities of collaboration in fisheries management: the northeast United States tilefish fishery. In R. Townsend, R. Shotton, and H. Uchida (Eds.), *Case studies in fisheries self-governance*. FAO Fisheries Technical Paper 504. Food and Agriculture Organization of the United Nations.