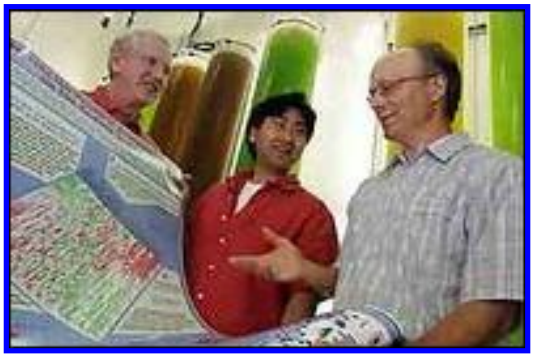
Without cod, all bets are off

Small fish eat too much plankton, threaten food chain, scientist says

By ALISON AULD / The Canadian Press



PETER PARSONS / Staff
Research scientists Brian Petrie, Jae Choi and Ken Frank discuss Scotian Shelf ecosystems at the Bedford Institute of Oceanography in Dartmouth on Thursday. Frank has just had an article on fish stocks published in Science magazine.

An entire marine ecosystem is being restructured because of the collapse of East Coast fish stocks more than a decade ago and could make their recovery nearly impossible, according to a unique study to be published today.

Researchers who looked at data over a 40-year period found that the food chain in the North Atlantic has been significantly altered with the disappearance of large species, like cod, a finding never seen before.

Ken Frank, who co-authored the report in Science magazine, said the findings provided an unsettling picture of the marine ecology on the eastern Scotian Shelf and the future of once-robust stocks that might never recover.

"It is worrisome," Frank said in an interview from his office in Dartmouth. "It kind of suggests that we're locked into this alternate state right now and unless there is some kind of unusual event, it may take quite some time for the cod domination to return."

Frank said the virtual disappearance of cod and other large species such as haddock, flounder and hake led to a cascade effect. Large predators declined dramatically, but the fish they preyed on - herring, capelin, shrimp and snow crab - were allowed to thrive and underwent a population explosion.

Cod, which used to sit on the top of the food chain, have been replaced by smaller fish that now dominate the marine world.

That also trickled down to the lowest members of the marine food chain - zooplankton and algae - that are being depleted at a faster rate because more and more fish are feeding on them. That has also raised the fear that the smaller fish species could diminish the nutrients they rely on.

"Their levels have now decreased because they're being eaten heavily by the exploding

group," said Frank, who works for the Department of Fisheries and Oceans at the Bedford Institute of Oceanography.

"It was always known that when you deplete a predator, its prey will increase. But it was never suspected that this would cascade or extend all the way down to the base of the food chain."

Scientists have also always known that the cascade effect existed in other bodies of fresh water, but they have never been able to prove until now that it could be found in the ocean.

The report raises concerns that the new environment will slow, if not prevent, the return of cod stocks, once the economic lifeblood of many fishing communities along the Atlantic coast. Fish that now dominate the food chain are feasting on young cod and making their recovery nearly impossible, said Frank.

The reshaping of the marine environment has benefited some, though. Seals have more to feed on since they're not having to fight for food with cod. And fishermen are landing lucrative catches of high-priced shrimp and snow crab, which are more abundant.

But Frank said the mistakes made in the cod fishery shouldn't be repeated with the shellfish industry.

"The collapse of cod should serve as a lesson that if you want to keep the populations sustainable you've got to have a conservation ethic in mind," he said. "You've got to resist the temptation to fish so heavily that the stock will deplete itself."

The research also indicates the phenomenon of cascading might be found in other areas of the North Atlantic where cod has diminished. Frank is exploring whether the food chain has been disrupted in the Gulf of St. Lawrence, the Grand Banks and the Labrador Shelf.

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