



Cod, phytoplankton, and shifting baselines

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IN THE chapter on cod in his terrific new book "[Four Fish](http://www.amazon.com/Four-Fish-Future-Last-Wild/dp/1594202567) (<http://www.amazon.com/Four-Fish-Future-Last-Wild/dp/1594202567>)", Paul Greenberg (full disclosure: Mr Greenberg is a friend) brings up the term "shifting baselines". The idea of shifting baselines was introduced in the early 1990s by fisheries biologist Daniel Pauly. At the time, fishermen and government authorities were just coming to accept the fact that cod fisheries had collapsed to a critical level, and that immediate fishing moratoriums were needed to have any hope of restoring cod to



sustainable levels. But what Mr Pauly found was that when scientists spoke of restoring the cod population to its natural level, they were thinking of a "natural" level that was already severely degraded from populations that had existed before the introduction of industrial fishing. As another biologist, Ted Ames, subsequently established, the memories of fishermen in their 80s and 90s weren't just tall tales: 100 years ago, cod thrived close to New England's shores in sizes and numbers that beggar the imagination of today's commercial and sport fishermen. Mr Pauly's insight was that the memory of this abundance has disappeared generation by generation. "This is not nostalgia on the part of the old or lack of empathy on the part of the young," Mr Greenberg writes. "It is almost a willful forgetting—the means by which our species, generation by generation, finds reasonableness amid the destruction of the greatest natural food system on earth."

Along the same lines, the July 29th issue of *Nature* publishes a paper (<http://www.nature.com/nature/journal/v466/n7306/full/nature09268.html>) by Boris Worm and two other marine scientists who find that the oceans' levels of phytoplankton, the "ubiquitous microscopic phototrophs [that] account for approximately half the production of organic matter on Earth," have been declining by about 1% per year for the past century. The scientists think [higher ocean temperatures are partially responsible](http://news.sciencemag.org/sciencenow/2010/07/critical-ocean-organisms-are-dis.html) (<http://news.sciencemag.org/sciencenow/2010/07/critical-ocean-organisms-are-dis.html>), and say the feedback loop is positive: fewer phytoplankton absorb less CO₂, which leads to yet higher temperatures. [Michael O'Hare](http://www.samefacts.com/2010/07/the-wayward-press/eating-the-seed-corn/) (<http://www.samefacts.com/2010/07/the-wayward-press/eating-the-seed-corn/>) and [Kevin Drum](http://motherjones.com/kevin-drum/2010/07/phytoplankton-dammerung) (<http://motherjones.com/kevin-drum/2010/07/phytoplankton-dammerung>) responded to this news with pessimistic alarm. Mr Drum wrote: "[M]aybe the oceans will die. Sorry about that, kids, but fixing it would have cost 2% of GDP and we decided you'd rather have that than have an ocean. You can thank us later."

I'm afraid Mr Drum is being too optimistic here. Not with the "oceans will die" line—that's clearly intended as hyperbole, and he obviously recognises there will be some sort of oceans in 2100, however degraded. The part that seems too optimistic to me is the expectation that our children or grandchildren will revile us for despoiling the planet they inhabit. I'm afraid that they, like ourselves, will succumb to shifting baselines, and will not even know how degraded the planet they inhabit is. Just as the global economy would probably largely adjust to global warming, abandoning desertified or flooded zones like Arizona and Florida, giving up on snow-skiing in favor of water-skiing, and so forth, future populations would probably adjust psychologically to the extinction of bluefin tuna, coral, killer whales, sea turtles, and hundreds of other species, and

would be reasonably happy on a seafood diet of catfish and mussels. You don't miss what you never had.

That, however, is not an argument for continuing to degrade the oceans. We are not our great-grandchildren, and when we think about what kind of world we want to leave them, I would imagine most of us would like it to be a thriving one, full of phytoplankton and wild fish, rather than a world of dead oceans where bio-engineered fish are found only in giant tanks. It's easy to throw up one's hands in the face of these problems. The hard thing is to do something about them. In 1996, the government passed the [Sustainable Fisheries Act \(http://www.nmfs.noaa.gov/sfa/\)](http://www.nmfs.noaa.gov/sfa/) . It still may not be enough to save cod stocks: cod in the Gulf of Maine are recovering, but [Canada's aren't \(http://news.sciencemag.org/sciencenow/2008/11/25-01.html\)](http://news.sciencemag.org/sciencenow/2008/11/25-01.html) . Still, it's a start.

(Photo credit: AFP)