Mind the Gap: Neoliberalism, Technology, and Human (In)Security in Atlantic Canada

DRAFT – Not for Citation

Wilfrid Greaves
PhD Candidate
Department of Political Science
University of Toronto

Prepared for the 83rd Annual Conference of the Canadian Political Science Association
Wilfrid Laurier University, May 16, 2010

Introduction

Global neoliberalism is implicitly and explicitly based upon a belief in technological progress and humanity's ability to develop new ways of overcoming the social and ecological problems that arise from its economic activities. This perspective is clearly expressed in the views of 'economic optimists', who perceive human potential to be virtually boundless and strongly reject claims of cognitive, material, or ecological limits upon the human capacity for problem solving. To the optimists, belief in the ability of the market to generate 'technological fixes' to solve its own social and ecological externalities is a central pillar of an ideology rooted in Enlightenment conceptions of modernity, progress, and reason. The belief in technological progress forms one of the cornerstones of contemporary "neoliberal market civilization,"[1] and provides a framework of justification for widespread industrialized resource extraction in challenging, dangerous, or ecologically uncertain circumstances.

This paper critically interrogates the conceptions of progress and the 'technological fix' that exist at the centre of neoliberal market civilization. It employs critical international relations theory, post-structuralist, and Green approaches to suggest that modern capitalism demonstrates an imbalance between its capacity to generate profitable extractive technology and its capacity to generate innovations able to solve the social and ecological problems generated by those extractive activities. This technology gap results in observable negative human security outcomes caused when technological 'safeguards' fail and extractive activities cause ecological damage that affects the security and wellbeing of human communities. Indeed, the effectiveness of industry at using high-technology methods to extract previously inaccessible resources has led to a growing gap that results in ever worse human security outcomes when technology fails.

This paper makes four related propositions: 1) contemporary market civilization is based on three foundational logics and a belief in the 'technological fix' as the solution to social and ecological free market externalities; 2) the technological fix is a false promise of market civilization because the profit motive of private investors results in a 'gap' between the technological capacity for resource extraction and the technological capacity to repair the damage caused by failures in extractive processes; 3) the security of human communities is conditioned by the quality of their physical environment; and 4) the interaction of the three logics of market civilization results in a technological gap causing environmental damage and worsened human security for affected communities. Environmentally driven human insecurity is thus a normal product of neoliberal market civilization. These propositions are demonstrated with respect to the collapse of the Atlantic Canadian fishery, wherein the technological fixes of managed fisheries, sophisticated fish stock modelling, and 'sustainable yields' failed to prevent the rapid collapse of North Atlantic cod stocks, and led to widespread economic and societal challenges to community-level human security in Atlantic Canada.

Modernity, Market Civilization, and the Technological Fix

Current global political and economic order is deeply rooted in a particular conception of Enlightenment modernity. Modernity in this sense is not defined as a particular temporal period, coherent logic, philosophy, or social or political project. Rather, post-structuralist accounts consider modernity as "a historical attitude or set of attitudes . . .highly mobile knowledge practices – interpretive practices and practical dispositions – that are widely circulated across dispersed and varied locales[,] . . .constitute modern subjects[,] . . .and enable and dispose these

[1] Stephen Gill, "Globalisation, Market Civilisation, and Disciplinary Neoliberalism," *Millennium: Journal of International Studies*, Vol. 24, No. 3 (1995).

subjects to the further replication of the practices themselves."[2] In simpler terms, modernity is a particular way of viewing the world, and consequently acting within and towards the world, that is self-referential and self-reinforcing. Once an agent is socialized into the foundational values, norms, limitations, exclusions, and practices of modernity, he or she becomes implicated in the perpetuation of the modern political project through the way in which he or she thinks, acts, reacts, and conceives the possibility for change within or to politics and society. By noting the way in which 'being modern' extends to all aspects of one's existence, modernity can be seen as a totalizing or hegemonic ontological formation; it commands for itself the authority to govern an individual's relations in all aspects of the political and social domains.

The global North is dominated by three logics inherent in the 'attitudes' of modernity: the logic of markets; the logic of science and technological progress; and the logic of bureaucracy.[3] These logics – the 'interpretive practices and practical dispositions' of modernity noted above – structure many aspects of contemporary global politics. They have, in fact, become increasingly dominant during the post-Cold War era with the formalization, institutionalization, and legalization of liberal individualism and market fundamentalism that has occurred globally.[4] These logics have spread around the world, in part, through Euro- and Western-centric processes of colonialism and imperialism, in their classic and modern variants, but find their most radical expression in contemporary neoliberalism and the neoliberal state. Economic markets, in particular, are central. Unlike other forms of capitalism, which have varying views of the appropriate role of the state and its relationship to society and markets, neoliberalism "holds that the social good will be maximized by maximizing the reach of and frequency of market transactions, and it seeks to bring all human action into the domain of the market."[5] The role and scope of the neoliberal state must correspondingly be minimized to the bare requirements for facilitating market transactions and the enforcement of contracts. The logics of modernity operate under neoliberalism to form the ideological foundations of what Stephen Gill termed the 'new constitutionalism' in global politics, "the political project of attempting to make transnational liberalism . . .the sole model for future development,"[6] thus privileging markets above society, private goods above public ones, and individual benefit over collective wellbeing. The inscription and entrenchment of free market orthodoxy within the structures and discourse of global governance has transformed society such that we can now be said to inhabit a "neoliberal market civilization" that is the philosophical and material descendent of Enlightenment individualism, monopoly capitalism, and concentration of political and economic power within an elite class of transnational capitalist actors.[7]

Some analysts have been described as 'economic optimists' because they place their faith in the combined power of these logics, as embodied in "free markets, science, and liberal

---

[2] Richard Ashley, "Living on Border Lines: Man, Poststructuralism, and War," in James Der Derian and Michael J. Shapiro, (eds.), *International/Intertextual Relations: Postmodern Readings of World Politics.* (Toronto: Lexington Books, 1989), 260-261.

[3] Matthew Taylor, "Twenty-first Century Enlightenment," Essay 1. (London: The RSA, June 2010): 24. (Accessed at www.thersa.org on November 17, 2010).

[4] For a study of legalization in global politics see Kenneth W. Abbott, Robert O. Keohane, Andrew Moravcsik, Anne-Marie Slaughter and Duncan Snidal, "The Concept of Legalization," *International Organization*, Vol. 54, No. 3 (2000).

[5] David Harvey, *A Brief History of Neoliberalism.* (New York: Oxford University Press, 2005), 3.

[6] Gill, 412.

[7] *Ibid*, 400. See also Vladimir Ilych Lenin, "Imperialism, the Highest Stage of Capitalism," in Robert C. Tucker, (ed.), *The Lenin Anthology*, (New York: W.W. Norton & Company, 1975).

democracy," to solve emerging global problems.[8] The optimists assert an indefinite human capacity for ingenuity and innovation at the same time that they diminish or outright dismiss suggestions of cognitive, material, or ecological limitations to economic growth and humanity's innovative potential.[9] Thus they claim that in "every sense except the one that is most literal and least important, the planet's resource base is growing larger, not smaller. Every day the planet becomes less an object and more an idea."[10] Eschewing material limitations on the power of ideas, economic optimists display indomitable faith in economic and political progress grounded in the view that just as human ingenuity has overcome so many obstacles to humanity's betterment in the past, so shall it continue to do so in the future. This view is perhaps most deeply embedded within the field of neoliberal economics, in which progress is central because it enables the "economic growth [that] produces the profits and jobs that in turn provide incomes and consumption for all classes of economic actors. Hence, the forces behind growth are integral to the neoliberal economic process."[11] The imperative to 'free' markets from government interference so that economies may continually grow in order to generate excess capital to be reinvested in that economy to grow it further, a process that must be repeated *ad infinitum*, thus forms the hard core of contemporary neoliberal market civilization.

The mechanism for this economic growth – also one of the greatest causal mechanisms for change within liberal political theory – is specifically *technological* progress. The product of human ingenuity, technological progress within the framework of global neoliberalism is the belief that humanity will generate solutions to social, economic, and environmental problems faster than those problems will endanger the ultimate goals of national prosperity and security.[12] Such progress ideally takes the form of 'technological fixes', solutions that do not require changing the underlying behaviours that caused the problem; according to Amory Lovins, technological fixes "are advantageous today by conventional economic criteria, and have no significant effect on life-styles."[13] Technological fixes are thus perfectly suited to market civilization because they do not challenge the *gestes repétés*, or normal modes and behaviours of everyday life, that arise from capitalism and underpin environmental problems.[14] Though belief in technological progress certainly varies, for the most devout economic optimists the ability of as-yet-undeveloped technologies to deliver humanity from the worst of its problems can refute the need to mitigate the causes of such problems in the first place.[15] Disciples of market fundamentalism emphasize that ingenuity-cum-technology will proffer a solution as soon as

---

[8] Thomas Homer-Dixon, *The Ingenuity Gap: How We Can Solve the Problems of the Future.* (Toronto: Knopf, 2000), 29.

[9] Julian Simon, (ed.), *The State of Humanity*. (Oxford: Blackwell, 1995).

[10] Jonathan Rauch, "The New Old Economy: Oil, Computers, and the Reinvention of the Earth," *The Atlantic Monthly*, Vol. 287, No. 1 (2001): 49.

[11] Elaine Hartwick and Richard Peet, "Neoliberalism and Nature: The Case of the WTO," *The Annals of the American Academy of Political and Social Science*, Vol. 590, No. 1 (2003): 206.

[12] Neoliberal market civilization universally employs state-centric conceptions of national security, because of the analytic primacy of states within the international system. See Jon Barnett, *The Meaning of Environmental Security: Ecological Politics and Policy in the New Security Era*. (London: Zed Books, 2001).

[13] Amory Lovins, "Energy Strategy: The Road Not Taken?" *Foreign Affairs*, Vol. 55, No. 1 (1976): 72.

[14] See Gill 1995 and Julian Saurin, "Global Capitalism as the 'Disaster Triumphant': The Private Capture of Public Goods," *Global Environmental Politics*, Vol. 10, No. 4 (2001).

[15] This view is remarkably commonplace, and can be seen with respect to a variety of public policy and environmental issues. For examples see: Nigel Lawson, *An Appeal to Reason: A Cool Look at Global Warming.* (New York: Overlook Press, 2008); Bjorn Lomborg, *Cool It: The Skeptical Environmentalist's Guide to Global Warming.* (Knopf: New York, 2007); and Simon (1995).

market incentives rise sufficiently to motivate human inquiry. Economists Joseph Stiglitz and Paul Krugman have referred to a related strain of neoliberal optimism as belief in "the confidence fairy."[16] The problem with such persistent optimism when applied to "the neoliberal theory of technological change . . .[is] it becomes so deeply embedded in entrepreneurial common sense, however, that it becomes a fetish belief: that there is a technological fix for each and every problem."[17] Indeed, in an era of global environmental problems transcending state boundaries, thus requiring coordinated action to effectively address, the promise of the technological fix is employed to reassure concerned publics that problems remain within the power of state and other elites to manage.[18]

The logic of bureaucracy might seemingly contradicts the logic of markets, which is premised upon minimizing the role of government. However, bureaucratization in this sense is not about expanding the role or size of government *per se*, but about the site of decision-making and the ability of citizens to engage and democratically interrogate the decision-mechanisms responsible for public policy. In this context, the neoliberal state stymies democratic accountability through two mechanisms: institutional delegation and institutional paralysis or capture. Delegation is a central, and not necessarily negative, feature of the 'new constitutionalism' of neoliberal market civilization; in a globalized world, it may be necessary if states are to grapple with the range of political and economic issues they face. Such delegation, however, involves shifting some measure of policy responsibility away from democratically accountable state actors. While some have suggested that the scope of state power has increased as a result of globalization and the emergence of transnational problems,[19] the institutionalization of free market principles within the architecture of global governance transfers substantial state decision-making authority both upwards to international institutions and downwards to private non-state actors. Thus, "neo-liberalization has entailed, for example, increasing reliance on public-private partnerships . . . Businesses and corporations not only collaborate intimately with state actors but even acquire a strong role in writing legislation, determining public policies, and setting regulatory frameworks."[20] The site of certain decision-making thus moves out of elected legislatures and into corporate offices or the institutional headquarters of international trade and financial organizations. Once delegated authority has been established, moreover, it tends to foster 'expert' and 'scientific' governance over democratically accountable mechanisms, including a preference for formalization, arbitration, and judicialization of decision-making and

[16] For examples see Joseph Stiglitz, "To choose austerity is to bet all on the confidence fairy," *The Guardian*. (October 19, 2010) and Paul Krugman, "Myths of Austerity," *The New York Times*. (July 1, 2010).
[17] Harvey, 68.
[18] This is shown by, to take two examples, statements of the Canadian and Alberta governments and corporate actors towards land reclamation in the Alberta tar sands and towards carbon capture and storage as a tool to combat climate change. See: Natural Resources Canada, "CanmetENERGY: Leadership in ecoInnovation," (Accessed at http://canmetenergy-canmetenergie.nrcan-rncan.gc.ca/eng/index.html on November 17, 2010); Government of Alberta, "Alberta's Oil Sands," (Accessed at http://www.oilsands.alberta.ca/ on November 17, 2010); Alberta Energy, "Carbon Capture and Storage," (Accessed at http://www.energy.alberta.ca/Initiatives/1438.asp on November 17, 2010); and Canadian Association of Petroleum Producers, "Carbon Capture and Storage," (Accessed at http://www.capp.ca/energySupply/innovationStories/Air/Pages/capturingStoringCarbon.aspx#znc7QW15XglG on November 17, 2010).
[19] Linda Weiss, *The Myth of the Powerless State.* (Cambridge: Polity Press, 1998).
[20] Harvey, 86-87.

dispute resolution consistent with the new constitutionalism.[21] This further reinforces the perceived strength of scientific expertise inherent to technological problem-solutions.

Delegation can thus contribute to institutional paralysis or capture, which derives from a critical view of the state as the site for elite competition. Peter Newell notes "there is a tendency to underplay the role of the state as the centrifugal unit in [non-state governance] networks. Even when they seemingly bypass the state . . .they often ultimately require forms of state authority."[22] The state remains crucial, but is hardly autonomous or independent of the influence of powerful domestic and transnational actors. To the contrary, while state power varies widely across different contexts and issue areas, one of the central effects of global neoliberalism has been to increase the power of private non-state actors relative to sovereign polities. The territoriality of states limits their policy options and leverage over highly mobile transnational actors; Matthew Paterson observes that, "because of the necessity of growth for capitalism to survive, those organising such growth, defined generally as capital, gain a great deal of power with respect to state decision-making."[23] This has been widely observed with respect to the role of private non-state actors in attempting to sway public and legislative opinion such that it protects or furthers their interests, perhaps nowhere more than regards environmental regulation.[24] Alternatively, if they must do business in a particular jurisdiction, non-state corporate actors have routinely subverted the independence of state apparatuses intended to regulate their activities, wherein "the seemingly autonomous administrative agency is, upon inspection, *captured*, and the seemingly constrained industries area liberated and enriched. Consequently, the industry tail wags the regulatory dog."[25]

Finally, a defining characteristic of modernity is that it privileges the authority of a particular 'sovereign voice' to determine the bounds of acceptable social, economic, and political discourse and praxis. The sovereign is held as the ahistorical adjudicator of claims to truth, legitimacy, and power, a disposition that Jacques Derrida and subsequent post-structuralist scholars termed *logocentrism*:

> A practical orientation and a procedure that at once presupposes, invokes, and effects a normalizing practical expectation. This is the expectation that all interpretation and practice must secure recognition and power by appeal to some identical consciousness, principle of interpretation or necessary subjectivity . . .A logocentric discourse is inclined to impose

---

[21] *Ibid*, 66; Gill, 411-415. See also contributions by Macdonald, Albo and Jenson, and Salter and Salter in Wallace Clement, (ed.), *Understanding Canada: Building on the New Canadian Political Economy.* (Montreal and Kingston: McGill-Queen's University Press, 1997). For a legal perspective see Barnali Choudhury, "Recapturing Public Power: Is Investment Arbitration's Engagement of the Public Interest Contributing to the Democratic Deficit?" *Journal of Transnational Law,* Vol. 42, No. 3 (2008).

[22] Newell, 520.

[23] Matthew Paterson, *Understanding Global Environmental Politics: Domination, Accumulation, Resistance.* (Basingstoke: Palgrave, 2001), 46.

[24] For examples see: James Hoggan and Richard Littlemore, *Climate Cover-Up: The Crusade to Deny Global Warming.* (Vancouver: Greystone Books, 2009); Naomi Oreskes and Erik M. Conway, *Merchants of Doubt: How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Global Warming.* (London: Bloomsbury Press, 2010); and Matthew Paterson, "Car Culture and Global Environmental Politics," *Review of International Studies*, Vol. 26, No. 2 (2000).

[25] Jon D. Hanson and David G. Yosifon, "The Situation: An Introduction to the Situational Character, Critical Realism, Power Economics, and Deep Capture," *University of Pennsylvania Law Review*, Vol. 152, No. 1 (2003): 204. Italics in original. See also Jean-Jacques Laffont and Jean Tirole, "The Politics of Government Decision-Making: A Theory of Regulatory Capture," *Quarterly Journal of Economics,* Vol. 106, No. 4 (1991).

> closure by resorting to one or another fixed standard of interpretation . . .a standpoint and standard supposedly occupying a place outside of history and beyond politics from which it is possible to give voice to a singular interpretation of the historical and political differences perceived.[26]

The logics of technology, markets, and bureaucracy are all privileged in modern politics, but it is scientific and technological development, so integral to progress and economic growth, that is the logocentric authority of Enlightened 'Reasoning Man'.[27] Technological progress is the sovereign voice of neoliberal market civilization, and evaluates all political and economic claims against the promise of human betterment that can supposedly be realized only by exposure to the generative forces of the marketplace. Technological progress has found expression in some of the grandest projects ever undertaken to 'improve' the human condition, and persists in its authority despite the abject and repeated failure of many of Reasoning Man's best efforts.[28]

The neoliberal sovereign of technological progress is clearly visible within the sub-discipline of global environmental politics (GEP). It is generally accepted that the hegemonic discursive and practical structure of GEP in the post-Cold War era is that of 'liberal environmentalism', an ontological compromise whose norms "predicate international environmental protection on the promotion and maintenance of a liberal economic order."[29] Approaches towards the management of environmental problems that contravene the ideological insistence upon limiting the role of government, minimizing regulation, exogenizing the costs of social and ecological externalities, and preserving the economic primacy of private actors are delegitimized by global neoliberalism's logocentric imperative of market-led technological progress. Newell observes that within GEP, "while economic orthodoxies are sacrosanct and protected from scrutiny, environmental measures are always evaluated according to their potential to negatively affect capital accumulation objectives."[30] Indeed, Steven Bernstein alludes to this foreclosure of conceptual and policy alternatives when he notes "that the framing and understanding of appropriate behaviour on environmental issues in global environmental governance forums stems from these [neoliberal] norms. Moreover, to the degree that practical measures stray from these norms, agreement or ability to implement practical responses will be difficult and conflict-laden."[31] One sees that global environmental politics is firmly rooted in neoliberal market civilization, and takes its meaning, sets its boundaries, and determines its conditions of possibility within the discursive and practical limitations of faith in technological progress, the free market, and bureaucratic domestic and transnational organizations that underpin the neoliberal constitutionalism of contemporary global order.[32]

---

[26] Ashley, 261-262.

[27] *Ibid*. For a related discussion of the importance of technological progress to a related sovereign voice, see the discussion of 'Hydrocarbon Man' in Daniel Yergin, *The Prize: The Epic Quest for Oil, Money, and Power*. (New York: Free Press, 2003).

[28] James C. Scott, *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed*. (New Haven: Yale University Press, 1998).

[29] Steven Bernstein, "Liberal Environmentalism and Global Environmental Governance," *Global Environmental Politics*, Vol. 2, No. 3 (2002): 1.

[30] Peter Newell, "The Political Economy of Global Environmental Governance," *Review of International Studies*, Vol. 34, No. 3 (2008): 518.

[31] Bernstein, 7.

[32] Some scholars have suggested that the particular hegemonic form of contemporary global environmental politics is that of 'ecological modernization'. See Maarten Hajer, *The Politics of Environmental Discourse: Ecological Modernisation and the Policy Process*. (Oxford: Oxford University Press, 1997).

3. Progress, Profit, and the Technology Gap

One of the central contentions of this paper is that the technological fix is a false promise of neoliberal market civilization. The modern view that progress is linear and technological innovation will indefinitely solve humanity's future problems is neither rational nor historically founded. To the contrary, it relies upon sweeping generalizations about the nature of past progress and blind optimism about the human capacity to generate ingenious solutions to current and emerging global challenges that are orders of magnitude greater and more complex than those we have confronted in the past. Rational scepticism about technological progress, which has also been called environmental realism,[33] is undermined in the global North by the prevalence of technological solutions to the quotidian inconveniences of daily life, which "give humans the illusion of dominating the world through high technologies more than at any time in history."[34] This faith in scientific salvation has been described as 'techno-hubris', understood simply as the view that market-driven technological innovation will indefinitely satisfy human problem-solving needs, diminishing the need for significant or sustained changes to human behaviour.[35] The result of fusing the sovereign authority of technological progress to the orthodoxy of the free market, techno-hubris is central to market civilization because "one of the characteristic features of the [neoliberal] growth ethic is a generally misguided faith in the magic of the 'technological fix'."[36]

The flaws of techno-hubris include the assumption that progress will occur when and where it is needed, and that it will do so uniformly across different areas of human endeavour. Economic optimists rest their faith in the technological fix on the exceptional scale and speed of technological change over the 19th and 20th centuries. Technological and human development during this period was indeed revolutionary, providing the material means required to support a global population that grew more than six hundredfold between the years 1800 and 2000. The high rate of technical innovation fostered a belief in the inevitability of technological and human development unfettered by cognitive, material, and ecological limits to further 'progress'. As Thomas Homer-Dixon has observed, however, actual scientific progress during the 19th and 20th centuries was wildly uneven across different areas of inquiry, and exceptional progress had no particular relationship with the most urgent human problems. So, whereas during this period usable military explosive power increased by a factor of approximately one billion and performance in communication technology by nearly one trillion, transportation speed increased by between fifty- and three hundredfold, and agricultural production by a mere fourfold.[37] These figures provide only rough estimates, but they demonstrate that the rates of technological progress vary substantially across different domains, and that the relative societal importance of those domains has little bearing upon the rate of progress. Given neoliberalism's dependence upon the boundless potential of technological progress, "economic optimists are not keen to

[33] Although this phrase has been used in different and conflictual ways, its most coherent form is summarized in Raymond Murphy, "Environmental Realism: From Apologetics to Substance," *Nature and Culture*, Vol. 1, No. 2 (2006).

[34] Verena Andermatt Conley, *Ecopolitics: The Environment in Poststructuralist Thought.* (New York: Routledge, 1997), 31.

[35] See Homer-Dixon 2000 and James Howard Kunstler, *The Long Emergency: Surviving the Converging Catastrophes of the Twenty-First Century.* (New York: Atlantic Monthly Press, 2005).

[36] Lionell Rubinoff, "Politics, Ethics, and Ecology," in Alex Wellington, Allan Greenbaum, and Wesley Cragg, (eds.), *Canadian Issues in Environmental Ethics*. (Peterborough: Broadview Press, 1997), 133.

[37] Homer-Dixon, 249-250.

acknowledge that technology solves some problems faster than others," or that there may be problems it cannot solve not at all.[38]

In practice, technological progress is also undermined by the other two logics of neoliberal market civilization: free markets and bureaucracy. Market civilization delegates responsibility for driving technological innovation primarily to market forces; the market incentivizes those technologies expected to be the most profitable.[39] This leads to greater emphasis upon developing technologies that will be profitable for private economic actors, and devalues technology with less clear or less profitable applications. Crucially, if the societal and environmental costs of resource extraction are not adequately priced by market mechanisms, then the technologies needed to address ecological and societal harms are unlikely to be adequately developed. As Julian Saurin states, "costs under capitalism are explicitly recognised *only* in the form of market prices and yet it is also the case that one of the characteristics of environmental harms is that markets either do not exist, or surrogate markets are weak."[40] Though profit is a clear and legitimate motivator of private innovation, the increasingly profit-driven nature of publicly funded science suggests that market forces will also determine the direction of public investment in research and technology. The ensuing commercialization of science suggests that profitable technologies will be developed faster than seemingly unprofitable ones, if the latter are developed at all.[41] Societal need – what Homer-Dixon calls its "ingenuity requirement,"[42] – is not the primary driver of innovation; the market price for a particular good or service is. The role of markets in driving innovation is relevant across the sub-discipline of global environmental politics, and the market-society imbalances that result have been examined in light of issues such as hazardous waste management, consumer culture, and global climate change.[43] Emerging carbon markets demonstrate that market-driven technological innovation is responsive to profits rather than social purpose; because carbon has not been effectively priced by the marketplace innovation remains limited and the societal need to reduce emissions goes unmet.

The myth of technological progress is also stymied by the logic of modern bureaucratic institutions, which can impede technological solutions to or regulation of environmentally harmful processes. As Peter Newell notes: "multilateral environmental negotiations are increasingly conducted in the shadow of world trade rules. This prioritisation of economic over environmental rule-making reflects . . .the ways in which the rights of capital over states are being enshrined in international trade and investment agreements."[44] Institutional delegation empowers international financial institutions such as the WTO, IMF, and World Bank to delimit,

---

[38] *Ibid*, 251.

[39] Richard R. Nelson, "The Simple Economics of Basic Scientific Research," *Journal of Political Economy,* Vol. 67, No. 3 (1959) and Richard R. Nelson, *The Sources of Economic Growth*. (Cambridge: Harvard University Press, 1996).

[40] Saurin, 77. Italics in original.

[41] Wei Hong and John P. Walsh, "For Money or Glory? Commercialization, Competition, and Secrecy in the Entrepreneurial University," *Sociological Quarterly*, Vol. 50, No. 1 (2009) and Ann Silversides, "Merchant Scientists: How Commercialization is Changing Research in Canada," *The Walrus Magazine*, Vol. 5, No. 4 (May 2008).

[42] Homer-Dixon, 4.

[43] See Jennifer Clapp, *Toxic Exports: The Transfer of Hazardous Wastes from Rich to Poor Countries*. (Ithaca: Cornell University Press, 2001); Peter Dauvergne, "The Problem of Consumption," *Global Environmental Politics*, Vol. 10, No. 2 (2010); and Peter Newell and Matthew Paterson, *Climate Capitalism: Global Warming and the Transformation of the Global Economy.* (Cambridge: Cambridge University Press, 2010).

[44] Newell, 514.

and in some cases dictate, the terms of global environmental protection, and largely frees powerful corporate actors to determine their own relationship with the environment.[45] Meanwhile, efforts to establish or update effective and enforceable regimes to govern high-stakes environmental issues that pit private interests against public goods – including the REDD framework for global deforestation, the UN Biodiversity Convention to address biodiversity loss, and the UN Framework Convention on Climate Change – have encountered, at best, limited success.[46] Instead, neoliberal environmental governance tends towards voluntary corporate compliance regimes, which remain premised on profit-making, and multilateral financial institutions that subordinate environmental decisions to economic and trade priorities.[47] Multilateral institutionalization tends towards minimalist environmental standards on the grounds that "it is infinitely better . . .to have an internationally agreed-on approach on accommodating legitimate environmental concerns in the multilateral trading system than to allow these concerns to be reflected in inconsistent, unilateral measures,"[48] even if unilateral measures could provide better environmental protection or incentivize technological solutions to discrete environmental problems.

States have not ceded all responsibility for environmental decision-making, but the delegation of environmental decisions to international and private actors contributes to limiting technological progress because it maintains the privileged role of private, profit-driven actors in driving innovation while dislocating state responsibility for the protection of the public good. If the central issue here regards the innovative lacunae that emerge when market-based incentives are relied upon to generate technological solutions to human problems, then institutional delegation further distances states from democratic decision-making processes that could generate problem-solutions not currently valorized by the market. Crucially, delegation has also empowered certain international institutions to override or direct state environmental decisions if these contravene neoliberal civilization's market orthodoxy. This has occurred, for example, in WTO arbitral rulings that have overturned domestic environmental legislation, as in the U.S. reformulated gasoline ruling and the so-called shrimp-turtle case,[49] and in the case of World Bank/IMF loan conditionality that has forced developing states to pursue resource exploitation in

[45] See Hartwick and Peet 2003; Ken Conca, "The WTO and the Undermining of Global Environmental Governance," *Review of International Political Economy*, Vol. 7, No. 3 (2000); and Robyn Eckersley, "The Big Chill: The WTO and Multilateral Environmental Agreements," *Global Environmental Politics*, Vol. 4, No. 2 (2004).

[46] See, respectively, Michael Orbsteiner *et al*., "On fair, effective and efficient REDD mechanism design," *Carbon Balance and Management*, Vol. 4, No. 11 (2008); Rachelle Adam, "Missing the 2010 Biodiversity Target: A Wake-up Call for the Convention on Biodiversity?" *Colorado Journal of International Environmental Law and Policy*, Vol. 21, No. 1 (2010); David G. Victor, "Toward Effective International Cooperation on Climate Change: Numbers, Interests and Institutions," *Global Environmental Politics*, Vol. 6, No. 3 (2003).

[47] See Steven Bernstein and Benjamin Cashore, "Can Non-State Global Governance be Legitimate? An Analytical Framework," *Regulation and Governance*, Vol. 1, No. 4 (2007); Radoslav Dimitrov, "Hostage to Norms: States, Institutions, and Global Forest," *Global Environmental Politics,* Vol. 5, No. 4 (2005); Robert Falkner, "Private Environmental Governance and International Relations: Exploring the Links," *Global Environmental Politics*, Vol. 3, No. 2 (2003); and Matthew Potaski and Aseem Prakash, "Green Clubs and Voluntary Governance: ISO 14001 and Firms' Regulatory Compliance," *American Journal of Political Science*, Vol. 49, No. 2 (2005).

[48] Hartwick and Peet, 195.

[49] World Trade Organization Appellate Body, "United States – Standards for Reformulated and Conventional Gasoline," WT/DS2/AB/R (Geneva: WTO, 1996) and World Trade Organization, "United States – Import Prohibition of Shrimp and Certain Shrimp Products: Report of the Panel," WT/DS58/R (Geneva: WTO, 1998). For a response to environment critics of the WTO see Eric Neumayer, "The WTO and the Environment: Its Past Record is Better than Critics Believe, but the Future Outlook is Bleak," *Global Environmental Politics*, Vol. 4, No. 3 (2004).

order to receive international lending.[50] This move also empowers non-state private actors, since they exert significant influence over international trade and financial institutions as well as domestic political structures.[51] Delegation, so consistent with the neoliberal modes of minimizing the role of government, maximizing the autonomy of markets, and, protecting the interests of transnational capital, culminates in a condition whereby "the public realm is left attempting to resolve the harms generated by [economic processes] . . .whilst the private entities – businesses and corporations – retain authority over production decisions."[52]

The logic of bureaucracy also limits technological progress through the paralysis of state institutions or the capture of regulatory bodies by private interests. In part, this is facilitated by the practice of institutional delegation, but is also driven by the interests of private capital. Widely identified in the public choice literature as 'regulatory capture', co-option of regulatory and oversight bodies in the field of global environmental politics has emerged as a significant problem in the context of neoliberal constitutionalism. The subordination of environmental decisions to international trade and financial institutions whose core constituencies consist of the world's largest and most significant non-state polluters has been described as putting "foxes in charge of the chickens."[53] Thus it seems clear that, whether employing the legal instruments of the new constitutionalism or the more traditional tools of private influence, corporate actors can paralyze or co-opt state institutions in order to "weaken environmental legislation and generally to align state policy more closely with the interests of dominant and transnational capital."[54] Partly as a result, technological progress as the panacea for human problems is undone by the normal operation of the other foundational logics of neoliberal market civilization.

Despite the market-based and bureaucratic limitations upon the production of societal innovation, even some critical scholars evoke techno-hubris by assuming the global North's ability to insulate itself from serious environmental and human insecurity through technological innovation.[55] But as Homer-Dixon warns, "these beliefs and the complacency they produce are often completely unwarranted; in fact, we often only have superficial control over the complex systems we've made and critically depend upon."[56] Belief in the technological fix as the definitive mechanism of human progress rests upon an ahistorical assumption of its inalienability from modern life; since modernity is defined by progress, the modern sovereign cannot consider a world in which technological progress may be limited, transient, or inadequate to the scale of human need. The result, it appears, is a world in which the volume of technological supply is presumed to exceed the scale of technological demand. Maarten Hajer comments that this mode of thought is "basically a modernist and technocratic approach to the environment that suggests that there is a techno-institutional fix for the present problems."[57] In practice, the culmination of the combined logics of technology, markets, and bureaucracy is a technological gap between the

---

[50] For an example see Patrick Williams, "The IMF/World Bank Structural Adjustment Program and Its Consequences for Guyana's Environment: An Examination of the Forestry and Mining Sectors," (Georgetown: World Wildlife Fund Guianas). Accessed at www.hdgc.epp.cmu.edu/mailinglists/hdgcctml/mail/pdf00006.pdf

[51] Ronald W. Cox, (ed.), *Business, State and International Relations*. (New York: New York University Press, 1996),

[52] Saurin, 76.

[53] Nicholas Hildyard, "Foxes in Charge of the Chickens," in Wolfgang Sachs, (ed.), *Global Ecology*. (London: Zed, 1993).

[54] Ted Benton, "An Ecological Historical Materialism," in Fred Gale and Michael M'Gonigle, (eds.), *Nature, Production and Power: Towards an Ecological Political Economy*. (Cheltenham: Edward Elgar, 2000): 104.

[55] For two diverse examples see Barnett 2001 and Lovins 1976.

[56] Homer-Dixon, 6.

[57] Hajer, 32.

capacity for extraction – a highly profitable undertaking – and the less profitable business of fixing the problems that arise when extractive technologies fail. Since such technological failure often involves negative ecological outcomes, this technological gap is implicated in human insecurity for communities affected by the ensuing environmental changes.

4. Human (In)Security and the Environment

The modern idea of progress is deeply embedded in contemporary discourses of security and environmentalism, which share a radical conceptual separation of Man and Nature. Traditional security theory centres upon the protection of state referent objects from military threats to their survival and national interests.[58] Liberal environmentalism, as discussed above, dominates global environmental politics and premises environmental policy-making upon the maintenance of a global neoliberal economic order.[59] Technological progress is integral as a means of continually increasing the level of security available to the state under conditions of anarchy,[60] just as it is essential to legitimating the primacy of economic priorities over environmental ones. The dominant discursive and practical structures of security and environment thus de-link constructions of the state and the economy, respectively, from broader interaction with or dependence upon a well functioning physical environment. In doing so, each valorizes non-human artefacts above human referents, and demonstrates how the 'state' and 'economy' have become interwoven and co-dependent at the same time that they have been radically divorced from the environment: "security as a cultural practice that defends the common 'liberal' way of life cannot therefore be separated from [economic] development."[61] Both frameworks situate humanity and its endeavours outside of a dependent relationship upon Nature, and subordinate human referent objects – be they individuals, communities, societies, or the species – to the higher interest of some other object of moral concern.

A literature on environmentally driven human insecurity challenges this separation, and situates the dependent relationship between humanity and a well functioning physical environment at the centre of its analysis.[62] Drawing on critical and Green insights, including the maxim that 'everything is connected to everything else', these works challenge certain themes in the fields of GEP and environmental security, including tendencies towards the separation of Man and Nature, state-centrism, technological logocentrism, and a homogenizing move towards neoliberal values and institutions. This is done through two principal assertions: first, of the normative desirability of employing human referent objects as the focus of security analysis, and second, of the physical, economic, and societal dependence of human security upon a functioning and relatively unpolluted physical environment. At its root, environmental human

[58] See John Mearsheimer, *The Tragedy of Great Power Politics*. (New York: W. W. Norton, 2001); Stephen M. Walt, "The Renaissance of Security Studies," *International Studies Quarterly*, Vol. 35, No. 2 (1991); and Kenneth N. Waltz, *Theory of International Relations*. (Reading: McGraw-Hill, 1979).
[59] Steven Bernstein, *The Compromise of Liberal Environmentalism*. (New York: Columbia University Press, 2001).
[60] Military imperatives have been intimately linked with successive developments of new forms of energy, including the growth of the fossil fuel economy. See Bruce Podobnik, *Global Energy Shifts: Fostering Sustainability in a Turbulent Age*. (Philadelphia: Temple University Press, 2006) and Arthur H. Westing, "The Military Sector vis-à-vis the Environment," *Journal of Peace Research*, Vol. 25, No. 3 (1988).
[61] Barnett, 32.
[62] See Barnett 2001; Simon Dalby, *Security and Environmental Change*. (Cambridge: Polity Press, 2009); Wilfrid Greaves, "The Essential Condition: A Stable Environment, Global Security, and Sustainable Peace," in Anne Livingstone, (ed.), *Environmental Conditions for Building Peace: The Pearson Papers Volume 12*. (Clementsport: Canadian Peacekeeping Press, 2009); and Richard A. Matthew, Jon Barnett, Bryan McDonald, and Karen L. O'Brien, (eds.), *Global Environmental Change and Human Security*. (Cambridge: MIT University Press, 2010).

security holds that "the environment, modified by human interference, sets the conditions for socio-political-economic life. When these conditions are poor, life is poor."[63] The environment, therefore, is seen to be the essential condition for the maintenance of human security, eclipsing in ontological importance other oft-used 'sectors' of security analysis.[64] Given the relatively high levels of human security enjoyed by most peoples within the global North, environmental changes are particularly relevant given that they may pose the single greatest source of insecurity facing the world's wealthiest and most secure populations.

When considering the core question of security analysis – who should be secured from what and how? – an ecologically informed approach to human security must inquire into social and economic processes that degrade or undermine the capacity of physical environments to support human life and provide the material necessities for human wellbeing. The structural forms of neoliberal market civilization are thus central to contemporary environmental security analysis because "it is the broader social and ecological degradation wrought by modernity which is the overriding context for any discussion of security."[65] It is possible to see how the logics of neoliberal market civilization, insofar as they result in an imbalance in the technological capacity to cause and resolve environmental problems, are centrally implicated in the (re)production of contemporary forms of human insecurity around the globe.[66] If, as many scholars have claimed, environmental damage should not be considered a by-product of modern society or an externality of economic processes, but rather as "a routine consequence of existing structures of power,"[67] then we must interrogate the logics of our current civilization not as neutral or normatively unproblematic, but as central contributors to ongoing conditions of human insecurity.

5. Modern Logics and the Collapse of the Atlantic Fishery

In 1992, the Canadian government imposed a moratorium on extraction of cod and other groundfish stocks from the north Atlantic fishery. This policy resulted from the collapse of reported populations of fish in the region, and ensuing fears about the short and long-term viability of the fishing industry, which directly and indirectly employed more than 50,000 people, primarily in Newfoundland and Labrador. The causes of the collapse and its ecological, economic, and social implications have been widely studied, and there is general agreement that it resulted from the interaction of a variety of phenomena.[68] Most observers agree that "the practice of [fisheries] management, which has led to depletion and dependence, points to the inability of resource management frameworks to control destructive fishing practices, the realities of which are connected to economic and technological realities that are present in

[63] Barry Buzan, Ole Waever, and Jaap de Wilde, *Security: A New Framework for Analysis*. (Boulder: Lynne Rienner, 1998), 84.
[64] For detail on sectors of security analysis see Buzan et al 1998.
[65] Barnett, 65.
[66] For a fuller discussion see David Roberts, *Human Insecurity: Global Structures of Violence.* (London: Zed, 2008).
[67] Newell, 512.
[68] See Ransom A. Myers, Jeffrey A. Hutchings, and Nicholas J. Barrowman, "Why do Fish Stocks Collapse? The Example of Cod in Atlantic Canada," *Ecological Applications*, Vol. 7, No. 1 (1997); National Research Council of Canada, *Canadian Marine Fisheries in a Changing and Uncertain World.* A Report Prepared for the Canadian Global Change Program of the Royal Society of Canada. (Ottawa: National Research Council, 1999); and Ransom A. Myers and Boris Worm, "Rapid Worldwide Depletion of Predatory Fish Communities," *Nature,* Vol. 423, No. 6937 (2003).

modern society generally."[69] There is virtually universal agreement that the primary cause was commercial overfishing ineffectively managed by government regulation. The collapse of the Atlantic Canadian fishery is examined here in light of the three logics of modernity and the context of environmentally driven human insecurity.

The overexploitation and ultimate depletion of the north Atlantic cod fishery was intimately connected with technological development in the fishing industry. Though fishing provided Atlantic Canada's economic base for much of the preceding 400 years, "technological developments such as radar, sonar, diesel engines, hydraulics, synthetic material for nets, and refrigeration, transformed the realities that shaped the exploitation of the fish in the Northwest Atlantic in the 1950s and 1960s."[70] Of particular note is the changing nature of fishing vessels in the post-war period, with traditional side trawlers giving way first to stern trawlers, whose extractive potential remained limited by their necessary proximity to port, and later to factory-equipped freezer trawlers capable of spending months at sea and catching and processing hundreds of tons of fish before returning to shore.[71] These 'turbo trawlers' were exceedingly effective at accomplishing their purpose, namely extracting as much fish as possible from coastal fisheries, and between "between 1960 and 1968, the catches of all groundfish off Canada's [east] coast increased by 55%."[72] 1968 is the high-water mark of the north Atlantic cod fishery, and in that year approximately 2,500,000 tonnes of groundfish, including 810,000 tonnes of cod, were extracted, more than three times as much as any year prior to 1954.[73] As a result of such massive extraction, by 1995 the total biomass of groundfish stocks in the Atlantic Canadian fishery had declined to 11% of 1982 levels and less than 6% of levels from the 1960s.[74] Much is made in the literature of the initial role of foreign fishers, primarily from Europe, in reducing cod stocks in the 1970s before the modernization of the Canadian fleet and assertion of sole Canadian fishing rights to a 200-mile coastal Economic Exclusion Zone (EEZ) enabled domestic extraction to push the fishery beyond a sustainable threshold in the early 1990s.[75] The EEZ was established "based on the recognition of predatory international fishing practices – which were then only replicated internally within national boundaries."[76] This suggests that within the context of a global neoliberal economic system, the distinction between foreign and Canadian fishers is largely irrelevant; both signify market actors pursuing private profit according to the accumulative logic of a common-pool resource.

The technological fixes promised by government and industry came in the form of

---

[69] Raymond A. Rogers, "The Aftermath of Collapse: Ethical Aspects in the Regulatory Failure of Canada's East Coast Fishery," in Alex Wellington, Allan Greenbaum, and Wesley Cragg, (eds.), *Canadian Issues in Environmental Ethics*. (Peterborough: Broadview Press, 1997), 81.

[70] *Ibid*, 84.

[71] Raymond B. Blake, "The International Fishery off Canada's East Coast in the 20th Century," in James E. Candow and Carol Corbin, (eds.) *How Deep is the Ocean? Historical Essays on Canada's Atlantic Fishery*. (Sydney: University College of Cape Breton Press, 1997), 208.

[72] *Ibid*, 212.

[73] Canada. *Policy for Canada's Commercial Fisheries.* (Ottawa: Department of Environment, Fisheries, and Marine Service, 1976) and Robert Kunzig, "Twilight of the Cod," *Discover*, Vol. 16, No. 4 (1995).

[74] National Research Council 1999 and R.W.D. Davies and R. Rangeley, "Banking on Cod: Exploring Economic Incentives for Recovering Grand Banks and North Sea Cod Fisheries," *Marine Policy*, Vol. 34, No. 1 (2010).

[75] This narrative features prominently in many discussions of the fishery's collapse. See Blake 1997; National Research Council 1999; and Rosemary E. Ommer and Peter R. Sinclair, "Systemic Crisis in Rural Newfoundland: Can the Outports Survive?" in John T. Pierce and Ann Dale, (eds.), *Communities, Development, and Sustainability Across Canada.* (Vancouver: UBC Press, 1999).

[76] Rogers, 90.

authoritative fish stock modelling, the surety that a sustainable yield, or Total Allowable Catch (TAC), existed and could be scientifically determined, and ultimately the moratorium itself. According to Ransom Myers, former scientist with the Canadian Department of Fisheries and Oceans (DFO) and pre-eminent scholar of the cod fishery collapse, the problem with modelling fish stock populations is that "the basic idea is, once you've eaten all the fish, you know how many there used to be."[77] The scientific solutions proffered by government to show that it could manage extraction from the fishery are illustrative of the desire for technological solutions even in their effective absence. Like all modelling, virtual population analysis (VPA) of fish stocks relies upon numerous assumptions, such as the view that "the commercial catch-per-unit effort is proportional to the abundance, and that this provides some protection for the stock as the population declines. This assumption has been shown to be false . . .The commercial catch-per-unit effort remained relatively high as the stocks declined because of the ability of modern fishing vessels to find and catch fish."[78] In other words, the extractive technology was too effective for a technological fix to easily curtail.

Official efforts to model and manage extraction from the north Atlantic fishery encountered unexpected economic limitations upon the utility of their scientific tools, and "scientific investigation consistently lagged behind economic realities of depleted stocks and inexorable exploitation of more-distant fishing grounds."[79] The profit incentive to develop extractive technology greatly exceeded efforts to manage the level of resource extraction, namely the development of methods to ameliorate the social, economic, and ecological damage caused by the fishery's collapse. The maintenance of the fishery as a functioning resource was not priced by the market, even though its collapse has cost the regional economy between $500 million and $1 billion in annual revenue for the past 18 years, in addition to more than $4 billion spent by the federal government in the form of vehicle and license retirement, social assistance, and re-training for Atlantic Canadian fishers.[80] Following the collapse, the regional economy, particularly that of Newfoundland and Labrador, was only saved from greater loss "to the extent that public funds substitute for cash inputs from the fishing industry,"[81] illustrating Saurin's claim that under neoliberalism profits from production accrue to private actors while costs and risk are borne by the state.[82] The promise of the technological fix persisted even after the collapse, with the moratorium itself being presented by the government as a short-term measure needed to restore the fishery to health, expected to end within two years of its imposition.[83] The moratorium has been in place ever since, and to date there has not been significant regeneration of cod stocks in the northwest Atlantic fishery.

In the wake of the technologically-induced collapse and the federal fishing moratorium, bureaucratic actors at all levels engaged in denial, obfuscation, and finger-pointing to avoid bearing responsibility for the devastating social, economic, and ecological impacts. To avoid accepting responsibility for insufficiently protecting the public interest, bureaucrats and their

---

[77] Quoted in Kunzig 1995.
[78] Myers et al, 104.
[79] Jeremy B.C. Jackson et al, "Historical Overfishing and the Recent Collapse of Coastal Ecosystems," *Science*, Vol. 293, No. 5530 (2001): 635.
[80] Davies and Rangeley 2010 and Malcolm MacGarvin, "Now or never – the cost of Canada's cod collapse and disturbing parallels with the UK," WWF Report. (Godalming: WWF-UK, 2010).
[81] Ommer and Sinclair, 64.
[82] Saurin 2001. See *supra* note 41.
[83] Quoted in Jake C. Rice, Peter A. Shelton, Denis Rivard, Ghislain A. Chouinard, and Alain Fréchet, *Recovering Canadian Atlantic Cod Stocks: The Shape of Things to Come?"* ICES Doc. CM 2003/U:06 (2003), 4.

political superiors engaged in three sets of tactics: 1) they claimed that decision-making power, and thus responsibility, actually rested with some other authority – delegation; 2) they initially refused to accept the scale of the problem, denying the need to alter existing regulatory mechanisms or management schemes – institutional paralysis; and 3) they claimed that causes besides overfishing were responsible, despite the scientific agreement that overfishing by private actors was *the* definitive cause – regulatory capture. Each can be illustrated in turn.

Arriving in Newfoundland on July 1, 1992, then federal Minister of Fisheries and Oceans John Crosbie was confronted by a group of residents protesting the federal government's imposition of a moratorium on the fishery. Amid shouts and argument, one woman said to the minister: "This situation is not our fault, Mr. Crosbie, this situation is not our fault. It's the government's fault . . .it's the government's mismanagement . . .It's not my fault, it's not my husband's fault, who's a fisherman. It's not our fault, and we shouldn't have to take the dirty end of the stick for it. It's not our fault." Shortly thereafter, addressing the crowd of angry Newfoundlanders, Crosbie responded, "Why are you yelling at me? I didn't take the fish from the God damn water, so don't go abusing me."[84] These comments by individuals who represent two key parties in the exploitation of the cod fishery speak of the absence of responsibility taken in the aftermath of the fishery's collapse. Though neither government nor the fishing industry was entirely to blame, neither could they reasonably deny their partial culpability in the unsustainable exploitation of the fishery: the government had clearly failed to manage the fishery, and the fishers and other fish-workers comprised a domestic industry that had been the primary extractor of cod since the establishment of the EEZ in 1977. Fishers blamed government and foreign vessels, government denied its responsibility and vacillated about the cause, so "rather than analyze the relationships and procedures which have caused the collapse of the fishery, most relevant fishery discussions have demonized the foreigner, the seal, and changing climatic conditions which allegedly caused the cod to freeze to death off the coast of Labrador."[85]

The delegation of responsibility by government and industry following the collapse was largely premised upon denial that overfishing was the fundamental cause of the problem. This involved two distinct phases: preceding the collapse, policymakers at DFO ignored the advice of their own scientists and set limits for the Total Allowable Catch that exceeded what the data suggested was the sustainable yield of cod. By the mid-1980s, it was apparent that DFO's projections of fish stocks had been wildly optimistic, but in 1989 the minister declined to follow his scientists' advice and reduce the TAC by half, reducing it by one tenth instead. As a result, in 1991 more than half of the total volume of all remaining fish in the waters off Newfoundland was extracted, and, just seven months before the imposition of the moratorium, the DFO set the same quota for the following year.[86] The capacity of government to take action had been compromised by the political and economic imperative of keeping the fishery open. This phase of denial was followed by a second round after the collapse, in which officials ignored, challenged, or lied about the scientific findings that overfishing had caused the collapse. Elizabeth Brubaker has detailed how, well into the mid-1990s, DFO officials, including the Minister and his deputies, attempted to dismiss their own scientists' findings about the cause of

[84] CBC News, "Cod Moratorium Protested," (July 2, 1992). Accessed at http://archives.cbc.ca/clip.asp?page=1&IDLan=1&IDClip=1081&IDCat=308&IDCatPa=256&IDDossier on December 9, 2010.
[85] Rogers, 83.
[86] Kunzig 1995.

the collapse, and eventually censured those scientists who spoke openly about overfishing.[87] Attempting to lay the blame on environmental factors such as changing ocean climate and voracious harp seals, "DFO routinely suppressed politically inconvenient research into the causes of the cod decline," ultimately suppressing, reprimanding, suing, and firing Ransom Myers for his public insistence on overfishing as the cause, contrary to the DFO's official position.[88] The primary tool that government used was an attempt to establish the validity of alternative environmental explanations, despite a paucity of scientific evidence. Questioned in the House of Commons about a 1995 report co-authored by Myers that affirmed the role of overfishing and downplayed the importance of environmental factors, Fisheries Minister Brian Tobin denied such a report existed. When challenged about this denial, Tobin "replied that scientists could be petulant, pompous prima donnas and suggested firing them."[89] According to Myers, the DFO "seemed to have notion that you could sit in Ottawa and *make up* reality. If you could enforce a scientific consensus, that would *become* reality."[90] Scientific logocentrism and bureaucratic paralysis are evident in the struggle to define the terms and assign responsibility for the cod fishery collapse.

Finally, the north Atlantic fishery shows signs of regulatory capture, insofar as the decisions and actions of government were taken primarily with industry's interests in mind. The data collected by DFO scientists in order to determine estimates of fish populations were gathered partly from the logs of commercial fishing trawlers.[91] Providing industry with the ability to influence scientific estimates of fish stocks that are then used to determine the Total Allowable Catch clearly gave private actors the opportunity to affect the stringency of their own regulation. Even the post-collapse financial assistance provided to the fishing industry served the interests of private capital more than it helped manage the structural problems of the industry and region. The Atlantic Groundfish Strategy (TAGS) was intended to help the fishing industry transition following the collapse and moratorium by reducing fishing capacity. In a report on federal spending to help Atlantic Canada 'adjust' to the moratorium, the Auditor General concluded that despite the intention that TAGS and other federal subsidies would help reduce the chronic over-capacity and over-capitalization of the East Coast fishery, five years later "effective fishing capacity was 160% of what it had been in the early 1990s."[92] That the collapse of groundfish stocks as a result of commercial overfishing should result in government programs whose end result is the further subsidization and modernization of those private commercial interests such that the physical capacity to exploit the now-exhausted resource actually increases is simply stunning. In retrospect, the DFO "was cheerleading rather than regulating,"[93] but the overall decision-making and response of government to management of the fisheries strongly suggests the satisfaction of commercial over public needs.

The technological gap that arises from the three logics of neoliberal market civilization is demonstrated by the collapse of the north Atlantic cod fishery and ensuing Canadian moratorium on commercial cod fishing in 1992. Arguments that the collapse of the fishery is primarily

[87] Elizabeth Brubaker, "Unnatural Disaster: How Politics Destroyed Canada's Atlantic Groundfisheries," in Terry Anderson, (ed.), *Political Environmentalism: Going Behind the Green Curtain*. (Stanford: Hoover Institution Press, 2000).
[88] *Ibid,* 167.
[89] Brubaker, 169.
[90] Quoted in Silver Donald Cameron, "Why Aren't Heads Rolling?" *The Globe and Mail.* (January 20, 1998).
[91] Ommer and Sinclair, 64.
[92] Quoted in Price et al, 6.
[93] Kunzig 1995.

attributable to excessive volumes of extraction enabled by high technology methods are by themselves unsurprising. Understanding the collapse of fisheries as resulting from the interaction of technological, commercial, and bureaucratic forces is the received wisdom within the literature. Essential, however, is understanding that fishery collapse, like other forms of resource depletion and exhaustion, is not an aberration or market failure *per se*, but the normal outcome of the interactions of these logics within market civilization. Though the fishery could be understood as a common pool resource whose benefits could be accessed immediately or distributed over time, the maintenance of a functional social economy, in this case that of Atlantic Canada, was not in itself valued by the marketplace, whereas a supply of codfish clearly was. The market incentives to develop high technology methods to extract these fish were clearly successful, scientific modelling and 'sustainable yields' categorically failed to provide technological fixes to the practice of overexploitation, and institutional failure acted as an enabler for privately driven resource exhaustion.

Bibliography

Abbott, Kenneth W., Robert O. Keohane, Andrew Moravcsik, Anne-Marie Slaughter and Duncan Snidal. 2000. "The Concept of Legalization," *International Organization*, Vol. 54, No. 3.

Adam, Rachelle. 2010. "Missing the 2010 Biodiversity Target: A Wake-up Call for the Convention on Biodiversity?" *Colorado Journal of International Environmental Law and Policy*, Vol. 21, No. 1.

Alberta Energy. "Carbon Capture and Storage." 2010. (Accessed at http://www.energy.alberta.ca/Initiatives/1438.asp on November 17, 2010).

Ashley, Richard. 1989. "Living on Border Lines: Man, Poststructuralism, and War," in James Der Derian and Michael J. Shapiro, (eds.), *International/Intertextual Relations: Postmodern Readings of World Politics.* Toronto: Lexington Books.

Barnett, Jon. 2001. *The Meaning of Environmental Security: Ecological Politics and Policy in the New Security Era.* London: Zed Books.

Benton, Ted. 2000. "An Ecological Historical Materialism," in Fred Gale and Michael M'Gonigle, (eds), *Nature, Production and Power: Towards an Ecological Political Economy.* Cheltenham: Edward Elgar.

Bernstein, Steven. 2001. *The Compromise of Liberal Environmentalism.* New York: Columbia University Press.

_____2002. "Liberal Environmentalism and Global Environmental Governance," *Global Environmental Politics*, Vol. 2, No. 3.

Bernstein, Steven and Benjamin Cashore. 2007. "Can Non-State Global Governance be Legitimate? An Analytical Framework," *Regulation and Governance*, Vol. 1, No. 4.

Blake, Raymond B. 1997. "The International Fishery off Canada's East Coast in the 20th Century," in James E. Candow and Carol Corbin, (eds), *How Deep is the Ocean? Historical Essays on Canada's Atlantic Fishery.* Sydney: University College of Cape Breton Press.

Brubaker, Elizabeth. 2000. "Unnatural Disaster: How Politics Destroyed Canada's Atlantic Groundfisheries," in Terry Anderson, (ed), *Political Environmentalism: Going Behind the Green Curtain*. Stanford: Hoover Institution Press.

Buzan, Barry, Ole Waever, and Jaap de Wilde. 1998. *Security: A New Framework for Analysis*. Boulder: Lynne Rienner.

Cameron, Silver Donald. 1998. "Why Aren't Heads Rolling?" *The Globe and Mail.* January 20.

Canada. 1976. *Policy for Canada's Commercial Fisheries.* Ottawa: Department of Environment, Fisheries, and Marine Service.

Canadian Association of Petroleum Producers. 2010. "Carbon Capture and Storage." (Accessed at http://www.capp.ca/energySupply/innovationStories/Air/Pages/capturingStoringCarbon.aspx#znc7QW15XglG on November 17, 2010).

CBC News. 1992. "Cod Moratorium Protested," July 2. Accessed at http://archives.cbc.ca/clip.asp?page=1&IDLan=1&IDClip=1081&IDCat=308&IDCatPa=256&IDDossier on December 9, 2010.

Choudhury, Barnali. 2008. "Recapturing Public Power: Is Investment Arbitration's Engagement of the Public Interest Contributing to the Democratic Deficit?" *Journal of Transnational Law,* Vol. 42, No. 3.

Clapp, Jennifer. 2001. *Toxic Exports: The Transfer of Hazardous Wastes from Rich to Poor Countries*. Ithaca: Cornell University Press.

Clement, Wallace, (ed.). 1997. *Understanding Canada: Building on the New Canadian Political Economy.* Montreal and Kingston: McGill-Queen's University Press.

Conca, Ken. 2000. "The WTO and the Undermining of Global Environmental Governance," *Review of International Political Economy*, Vol. 7, No. 3.

Conley, Verena Andermatt. 1997. *Ecopolitics: The Environment in Poststructuralist Thought.* New York: Routledge.

Cox, Ronald W, (ed). 1996. *Business, State and International Relations.* New York: New York University Press.

Dalby, Simon. 2009. *Security and Environmental Change.* Cambridge: Polity Press.

Dauvergne, Peter. 2010. "The Problem of Consumption," *Global Environmental Politics*, Vol. 10, No. 2.

Davies, R.W.D. and R. Rangeley. 2010. "Banking on Cod: Exploring Economic Incentives for Recovering Grand Banks and North Sea Cod Fisheries," *Marine Policy*, Vol. 34, No. 1.

Dimitrov, Radoslav. 2005. "Hostage to Norms: States, Institutions, and Global Forest," *Global Environmental Politics,* Vol. 5, No. 4.

Eckersley, Robyn. 2004. "The Big Chill: The WTO and Multilateral Environmental Agreements," *Global Environmental Politics*, Vol. 4, No. 2.

Falkner, Robert. 2003. "Private Environmental Governance and International Relations: Exploring the Links," *Global Environmental Politics*, Vol. 3, No. 2.

Gill, Stephen. 1995. "Globalisation, Market Civilisation, and Disciplinary Neoliberalism," *Millennium: Journal of International Studies*, Vol. 24, No. 3.

Government of Alberta. 2010. "Alberta's Oil Sands." (Accessed at http://www.oilsands.alberta.ca/ on November 17, 2010)

Greaves, Wilfrid. 2009. "The Essential Condition: A Stable Environment, Global Security, and Sustainable Peace," in Anne Livingstone, (ed), *Environmental Conditions for Building Peace: The Pearson Papers Volume 12*. Clementsport: Canadian Peacekeeping Press.

Hajer, Maarten. 1997. *The Politics of Environmental Discourse: Ecological Modernisation and the Policy Process*. Oxford: Oxford University Press.

Hanson, Jon D. and David G. Yosifon. 2003. "The Situation: An Introduction to the Situational Character, Critical Realism, Power Economics, and Deep Capture," *University of Pennsylvania Law Review*, Vol. 152, No. 1.

Hartwick, Elaine and Richard Peet. 2003. "Neoliberalism and Nature: The Case of the WTO," *The Annals of the American Academy of Political and Social Science*, Vol. 590, No. 1.

Harvey, David. 2005. *A Brief History of Neoliberalism.* New York: Oxford University Press.

Hildyard, Nicholas. 1993. "Foxes in Charge of the Chickens," in Wolfgang Sachs, (ed), *Global Ecology.* London: Zed.

Hoggan, James and Richard Littlemore. 2009. *Climate Cover-Up: The Crusade to Deny Global Warming*. Vancouver: Greystone Books.

Homer-Dixon, Thomas. 2000. *The Ingenuity Gap: How We Can Solve the Problems of the Future.* Toronto: Knopf.

Hong, Wei and John P. Walsh. 2009. "For Money or Glory? Commercialization, Competition, and Secrecy in the Entrepreneurial University," *Sociological Quarterly*, Vol. 50, No. 1.

Jackson, Jeremy B.C., Micahel X. Kirby, Wolfgang H. Berger, Karen A. Bjorndal, Louis W. Botsford, Bruce J. Bourque, Roger H. Bradbury, Richard Cooke, Jon Erlandson, James A. Estes, Terence P. Hughes, Susan Kidwell, Carina B. Lange, Hunter S. Lenihan, John M. Pandolfi, Charles H. Peterson, Robert S. Steneck, Mia J. Tegner, and Robert R. Warner. 2001. "Historical Overfishing and the Recent Collapse of Coastal Ecosystems," *Science*, Vol. 293, No. 5530.

Krugman, Paul. 2010. "Myths of Austerity," *The New York Times*. July 1.

Kunstler, James Howard. 2005. *The Long Emergency: Surviving the Converging Catastrophes of the Twenty-First Century*. New York: Atlantic Monthly Press.

Kunzig, Robert. 1995. "Twilight of the Cod," *Discover*, Vol. 16, No. 4.

Laffont, Jean-Jacques and Jean Tirole. 1991. "The Politics of Government Decision-Making: A Theory of Regulatory Capture," *Quarterly Journal of Economics,* Vol. 106, No. 4.

Lawson, Nigel. 2008. *An Appeal to Reason: A Cool Look at Global Warming.* New York: Overlook Press.

Lenin, Vladimir Ilych. 1975. "Imperialism, the Highest Stage of Capitalism," in Robert C. Tucker, (ed.), *The Lenin Anthology*. New York: W.W. Norton & Company.

Lomborg, Bjorn. 2007. *Cool It: The Skeptical Environmentalist's Guide to Global Warming.* Knopf: New York.

Lovins, Amory. 1976. "Energy Strategy: The Road Not Taken?" *Foreign Affairs,* Vol. 55, No. 1.

MacGarvin, Malcolm. 2001. "Now or never – the cost of Canada's cod collapse and disturbing parallels with the UK," WWF Report. Godalming: WWF-UK.

Matthew, Richard A., Jon Barnett, Bryan McDonald, and Karen L. O'Brien, (eds). 2010. *Global Environmental Change and Human Security.* Cambridge: MIT University Press.

Mearsheimer, John. 2001. *The Tragedy of Great Power Politics*. New York: W. W. Norton.

Murphy, Raymond. 2006. "Environmental Realism: From Apologetics to Substance," *Nature and Culture*, Vol. 1, No. 2.

Myers, Ransom A., Jeffrey A. Hutchings, and Nicholas J. Barrowman. 1997. "Why do Fish Stocks Collapse? The Example of Cod in Atlantic Canada," *Ecological Applications*, Vol. 7, No. 1.

Myers, Ransom A. and Boris Worm. 2003. "Rapid Worldwide Depletion of Predatory Fish Communities," *Nature,* Vol. 423, No. 6937.

National Research Council of Canada. 1999. *Canadian Marine Fisheries in a Changing and Uncertain World.* A Report Prepared for the Canadian Global Change Program of the Royal Society of Canada. Ottawa: National Research Council.

Natural Resources Canada. 2010. "CanmetENERGY: Leadership in ecoInnovation." (Accessed at http://canmetenergy-canmetenergie.nrcan-rncan.gc.ca/eng/index.html on November 17, 2010).

Nelson, Richard R. 1959. "The Simple Economics of Basic Scientific Research," *Journal of Political Economy,* Vol. 67, No. 3.

_____1996. *The Sources of Economic Growth*. Cambridge: Harvard University Press.

Neumayer, Eric. 2004. "The WTO and the Environment: Its Past Record is Better than Critics Believe, but the Future Outlook is Bleak," *Global Environmental Politics*, Vol. 4, No. 3.

Newell, Peter. 2008. "The Political Economy of Global Environmental Governance," *Review of International Studies*, Vol. 34, No. 3.

Newell, Peter and Matthew Paterson. 2010. *Climate Capitalism: Global Warming and the Transformation of the Global Economy.* Cambridge: Cambridge University Press.

Ommer, Rosemary E. and Peter R. Sinclair. 1999. "Systemic Crisis in Rural Newfoundland: Can the Outports Survive?" in John T. Pierce and Ann Dale, (eds), *Communities, Development, and Sustainability Across Canada.* Vancouver: UBC Press.

Orbsteiner, Michael, Michael Huettner, Florian Kraxner, Ian McCallum, Kentaro Aoki, Hannes Böttcher, Steffen Fritz, Mykola Gusti, Petr Havlik, Georg Kindermann, Ewa.d Rametsteiner and Belinda Reyers. 2008. "On fair, effective and efficient REDD mechanism design," *Carbon Balance and Management*, Vol. 4, No. 11.

Oreskes, Naomi and Erik M. Conway. 2010. *Merchants of Doubt: How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Global Warming.* London: Bloomsbury Press.

Paterson, Matthew. 2000. "Car Culture and Global Environmental Politics," *Review of International Studies*, Vol. 26, No. 2.

_____2001. *Understanding Global Environmental Politics: Domination, Accumulation, Resistance*. Basingstoke: Palgrave.

Podobnik, Bruce. 2006. *Global Energy Shifts: Fostering Sustainability in a Turbulent Age*. Philadelphia: Temple University Press.

Potaski, Matthew and Aseem Prakash. 2005. "Green Clubs and Voluntary Governance: ISO 14001 and Firms' Regulatory Compliance," *American Journal of Political Science*, Vol. 49, No. 2.

Rauch, Jonathan. 2001. "The New Old Economy: Oil, Computers, and the Reinvention of the Earth," *The Atlantic Monthly*, Vol. 287, No. 1.

Rice, Jake C. Peter A. Shelton, Denis Rivard, Ghislain A. Chouinard, and Alain Fréchet. 2003. *Recovering Canadian Atlantic Cod Stocks: The Shape of Things to Come?"* ICES Doc. CM 2003/U:06.

Roberts, David. 2008. *Human Insecurity: Global Structures of Violence.* London: Zed.

Rogers, Raymond A. 1997. "The Aftermath of Collapse: Ethical Aspects in the Regulatory Failure of Canada's East Coast Fishery," in Alex Wellington, Allan Greenbaum, and Wesley Cragg, (eds), *Canadian Issues in Environmental Ethics.* Peterborough: Broadview Press.

Rubinoff, Lionell. 1997. "Politics, Ethics, and Ecology," in Alex Wellington, Allan Greenbaum, and Wesley Cragg, (eds), *Canadian Issues in Environmental Ethics.* Peterborough: Broadview Press.

Saurin, Julian. 2001. "Global Capitalism as the 'Disaster Triumphant': The Private Capture of Public Goods," *Global Environmental Politics*, Vol. 10, No. 4.

Scott, James C. 1998. *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed.* New Haven: Yale University Press.

Silversides, Ann. 2008. "Merchant Scientists: How Commercialization is Changing Research in Canada," *The Walrus Magazine*, Vol. 5, No. 4.

Simon, Julian (ed). 1995. *The State of Humanity*. Oxford: Blackwell.

Stiglitz, Joseph. 2010. "To choose austerity is to bet all on the confidence fairy," *The Guardian*. October 19.

Taylor, Matthew. 2010. "Twenty-first Century Enlightenment," Essay 1. London: The RSA. (Accessed at www.thersa.org on November 17, 2010).

Victor, David G. 2003. "Toward Effective International Cooperation on Climate Change: Numbers, Interests and Institutions," *Global Environmental Politics*, Vol. 6, No. 3.

Walker, R.B.J. 1993. *Inside/Outside: International Relations as Political Theory.* Cambridge: Cambridge University Press.

Walt, Stephen M. 1991. "The Renaissance of Security Studies," *International Studies Quarterly*, Vol. 35, No. 2.

Waltz, Kenneth N. 1979. *Theory of International Relations.* Reading: McGraw-Hill.

Weiss, Linda. 1998. *The Myth of the Powerless State.* Cambridge: Polity Press.

Westing, Arthur H. 1988. "The Military Sector vis-à-vis the Environment," *Journal of Peace Research*, Vol. 25, No. 3.

World Trade Organization. 1998. "United States – Import Prohibition of Shrimp and Certain Shrimp Products: Report of the Panel," WT/DS58/R. Geneva: WTO.

World Trade Organization Appellate Body. 1996. "United States – Standards for Reformulated and Conventional Gasoline," WT/DS2/AB/R. Geneva: WTO.

Yergin, Daniel. 2003. *The Prize: The Epic Quest for Oil, Money, and Power.* New York: Free Press.