

# Theorizing Environmental Governance of the World-System: Global Political Economy Theory and Some Applications to Stratospheric Ozone Politics<sup>1</sup>

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## **Abstract**

*This paper incorporates world-systems perspectives into an analysis of global environmental politics, thus adjoining a political economic analysis of scale with studies of global environmental policy. It is the ability of some social groups and institutions to jump scale that determines how global environmental policies are shaped. The United States' carbon-intensive economy is seen to face larger short-term costs from global environmental agreements than many other countries in the core of the world-system, but what remains unexplored in the environmental politics literature is the question of why the United States sees its long-term economic condition hindered by these agreements. This analysis points to the ways industry actors intervene at multiple scales of global environmental negotiations to affect national policy positions as well as larger discourses about science and risk. The article reviews the methyl bromide controversy in the Montreal Protocol to explain why this agreement has recently failed to live up to expectations in removing ozone-depleting substances. The United States is particularly responsible for this impediment: rather than innovate in response to new information and changing international contexts, industry actors have drawn upon US hegemony to enforce their dominant market positions. As the parties to the Montreal Protocol remain polarized over questions of methyl bromide use, this analysis calls for attention to the ways capital, states, and other social institutions are embedded in international environmental agreements and how they use such arrangements to obstruct successful multilateral agreements. I conclude by suggesting that environmental and other social movements might strategize in two ways: 1) by helping support an emergent 'green hegemony' (most apparent in Chinese policy) as a counterhegemonic alternative, and 2) by developing strategies that account for the ways industry interests overlap with declining US hegemony in a shifting world-system.*

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Understanding the outcomes of international environmental negotiations requires more extensive attention to how key states are embedded in the larger world-system. The following analysis shows how various influential actors in the international negotiations on ozone layer depletion are linked to important, powerful national industries. Understanding the multiplicity of actors and their connections to key industries and interests helps account for the recent failures in negotiations to protect the ozone layer. The paper explores some of the leading literatures in global political economy and capitalist development in order to uncover why treaties on global environmental protection so frequently fail. Indeed, ozone layer protection is not the only area of concern in this regard. The failed climate change negotiations are a major case in point (cf. Roberts and Parks 2007; also note the recent Rio+20 meeting). To better understand the reasons for these failures I argue for a conjoining of world-systems analysis of large-scale changes with studies of global environmental policy.

World-systems analyses utilize theoretical approaches able to interrogate socio-economic activity at various scales, thus investigating the degree to which some institutions (corporate or public), civil society groups (environmental, scientific, industrial, religious, etc.), and nation-states are able to influence global and international agreements. The paper will examine iterations of world-systems perspectives that are flexible enough to move from one scale to another. These approaches present theoretical visions of the global political and economic barriers to effective global environmental governance, providing both an historical vision of social change and critical assessments of the links between the state, capital, civil society, local communities, and geopolitics. Importantly, world-system approaches are able to assess power and social influence as they move across scales, following actors, institutions, and political agendas from local, state and international levels while remaining attentive to the political economic tendencies that exist in global capitalism.

In this usage, scale is seen as both relational and contextual; relational because the degree to which some actors can exert pressure at the global level is related to their political and economic power at other scales (the national, regional, state, and communal) as well as to their status in the global economy. It is also contextual, because certain aspects of global environmental policy, such as nation-state sovereignty, cannot be ‘scaled down’ or ‘scaled up.’ Yet, this analysis suggests that the power that strong nation-states have at the international environmental regulatory level confounds understandings of state power as wholly ‘fixed’ at the state level. Rather, studies at the global scale must recognize how global politics are impacted by global, national, and regional powers that fluctuate over space and time (cf. Arrighi 1994, Harvey 2006: chs. 12 and 13). In the case of the Montreal Protocol, the power of certain nation-states combined with the more fluid operation of capitalist interests have inhibited the full potential of international environmental policy, reflecting broader changes in global political economic power and hegemony.

The world-systems approaches presented here are mindful of the historical patterns of global economic hegemony and changes in the spatial configurations of global economic activity. This theoretical strand suggests that US global hegemony is declining as its economy becomes more dependent on foreign capital, and as other regions become more economically competitive. This speculation in turn suggests why the US has recently involved itself in global environmental agreements in such a protectionist way – perhaps more protectionist than in years past – even amid the current neoliberal economic milieu. The connection between US economic interests, its declining hegemony, and its protectionist involvement in global environmental

policies raise questions about the leniency shown toward the US in international environmental agreements. I conclude with reference to Roberts's and Parks's (2007) useful contribution on global environmental agreements by supporting their call for reducing global inequality in order to improve the effectiveness of environmental agreements. But I add to this the importance of supporting an environmentally-sound hegemonic shift, one perhaps centralized around China.

### **Background: The Montreal Protocol in Crisis**

The 1987 Montreal Protocol on Substances that Deplete the Ozone Layer is considered by many the emblematic success story of international environmental agreements (Litfin 1994; Benedick 1998; Andersen et al. 2002; Parson 2003; Conca and Dabelko 2004). Ozone-depleting substances break down ozone molecules that, by protecting the earth from ultraviolet radiation, literally make life on Earth possible. As Ken Conca (2006) puts it,

reached in September 1987 and entering into force just sixteen months later, the Montreal Protocol was the critical step in consolidation of the stratospheric ozone protection regime. It replaced vague commitments with specific goals and timetables for cutting back on production and use of ozone-depleting chemicals. (25)

The combination of nation-state cooperation, effective corporate participation, a capable, informed, and respected scientific community, and vibrant support from civil society are regularly regarded as critical components to the relatively smooth phase-out of most chlorofluorocarbons (CFCs), the chief ozone-depleting substance (Cf. Haas 1992; Litfin 1994; Young 1994, 2002; Benedick 1998; Andersen, et. al. 2002; Parson 2003; Conca 2006; Andersen et al. 2007; Kaniaru 2007).

However, although some regimes might get off to a smooth start, they can change trajectory. For the Montreal Protocol, Oran Young (2002) notes, "the news is not entirely good with regard to phasing out [remaining] CFCs" (87). This is largely because, for the majority of CFC uses, alternatives were readily available, profitable, and held by the largest and most powerful CFC producers, whilst remaining uses are less easily replaced and sometimes are politically contentious (Gareau 2010). In addition, CFCs are still produced and exported illegally, especially in the Asia and Pacific Region (Ning 2007). Nevertheless, the Montreal Protocol has successfully phased out close to ninety-five percent of legal CFC use, which is indeed promising for global governance proponents. If the news is not good for phasing out remaining CFCs, however, then it is even worse with regard to methyl bromide, an agricultural fumigant and significant ozone-depleting substance (ODS). At the Copenhagen meeting of the Montreal Protocol in 1992, member states mandated the systematic phase-out of methyl bromide, which is used heavily in strawberry production and for quarantine pre-shipment. Parties to the Protocol organized a phase-out by 2005 for industrialized countries, and by 2015 for less-developed countries (LDCs). The ten-year extension for LDCs was designed to help those countries make the transition to less harmful alternatives. But 2005 has come and gone, and methyl bromide is still used today in the industrialized world, if in smaller quantities than in earlier years.

In addition, some industrialized nations—including the United States—have refused to relinquish methyl bromide in agriculture as per the Protocol's phase-out schedule, asserting that

the alternatives do not provide equivalent results. This argument of needing equivalent results is made legitimate by the inclusion of particular language in the treaty (see below).<sup>2</sup> Nevertheless, this case illustrates how the United States has prolonged the use of a substance that the global community has deemed dangerous to the entire world. It seems that the wait for an acceptable alternative will continue, as the United States continues to request allowances for future methyl bromide use (U.S. Department of State 2012).

Methyl bromide use is allowed in the United States and other member states by the treaty's "critical use exemptions" to the Protocol's phase-out (Decision IX/6 of the Montreal Protocol). The U.S. request for critical use exemptions in 2005 was by far the largest, totaling almost 10,000 metric tons, over half the exemptions requested worldwide. Such exemptions could delay ozone layer recovery well into the future, increasing surface ultraviolet radiation levels and rates of skin cancer, and threatening agriculture and societies worldwide (United Nations Development Programme 1999; Ozone Secretariat 2003; Goodhue et al. 2005). The United Nations Environmental Programme (UNEP) reports that methyl bromide leads to the ozone layer's destruction at a rate similar to that of CFCs (WMO/UNEP 2002), but it also has a localized impact. In some situations applicators and residents have inhaled the chemical, leading to eye and skin irritation, to damage to the central nervous system, kidneys, and lungs, and even to death (California Department of Pesticide Regulation 1990-1992; 1996; Californians for Alternatives to Toxics 1994).

The quantities of methyl bromide exempted from phase-out have fluctuated over the years, and overall use actually increased in 2005, but has since been gradually on the decline. Gareau (2008; 2012) shows that, since 2003, LDCs and international non-governmental organizations (NGOs) have declared at Montreal Protocol deliberations that the United States should have taken precautionary measures to avoid the need for critical use exemptions, and that they themselves have found technically and economically feasible alternatives to methyl bromide, often with help from the Protocol's Multilateral Fund.<sup>3</sup> Furthermore, LDCs contest that allowing for large exemptions in the developed world could compromise terms of trade for less-developed nations if the adopted alternatives prove less effective (Gareau and DuPuis 2009). Nevertheless, the exemptions have moved through, seemingly at the behest of the U.S. government.

U.S. influence in the Montreal Protocol (and other global environmental agreements for that matter – see Speth 2005, 2008) is exceptional. For example, in 2003 the Montreal Protocol's Agricultural Economics Task Force (AETF) provided a rigorous economics-based report about the feasibility of alternatives to methyl bromide in strawberry production. The report concluded that most requests for phase-out exemptions were inaccurate, not because they did not reflect the Montreal Protocol guidelines for exemptions, but rather because they demonstrated an unwillingness to make an economically rational switch to non-ODS substitutes (DeCanio and

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<sup>2</sup> Recently an alternative was registered by the United States Environmental Protection Agency (EPA) that would have dramatically reduced the need for methyl bromide, methyl iodide- an extremely toxic substance that endangers human health and water quality (California Coastkeeper Alliance 2011). However, civil society groups, mainly in California (where most remaining U.S. methyl bromide use is concentrated) have caused such a public display of discontent with the substitute that it was taken off the shelf by its maker, Japan-based Arysta LifeScience Corporation (Wollan 2012).

<sup>3</sup> The Multilateral Fund for the Implementation of the Montreal Protocol was established in 1991 "to assist developing countries meet their Montreal Protocol commitments," and it is funded by the industrialized countries "according to the UN scale of assessment" (<http://www.multilateralfund.org>).

Norman 2005; for counter-argument, see Goodhue, et. al. 2005). In plenary sessions, the United States responded to the report with disapproval, noting that it would only acknowledge the outcomes of the report as a “learning process.” Although impossible to show a direct correlation, DuPuis and Gareau (2008) illustrate how the AETF was dissolved during the 2003 Open-Ended Meeting of the Montreal Protocol. In support of the LDC’s argument about alternatives, Mayfield and Norman (2012) have shown that the (much delayed) methyl bromide phase-out has indeed not hampered the expansion of California’s strawberry production complex, which has increased in scale and yield despite gradual reductions in the use of the chemical.

Another sign of U.S. environmental hegemony is that, on November 26, 2004, the Parties approved a large adjustment made to the Methyl Bromide Technical Options Committee report (MBTOC, a sub-group of TEAP) allowing for larger levels of methyl bromide, even though their previous report did not recommend this increase. Some countries, like New Zealand, expressed concern because they do not have stockpiles of methyl bromide, and could thus find themselves at an economic disadvantage to stockpiling countries like the United States. Early that week, the United States accused MBTOC of mixing its scientific findings with political actions by proposing an arbitrary cut-off for exemptions. MBTOC denied this claim. As a result, not only the United States, but also *fourteen other developed countries* negotiated for higher permitted levels of methyl bromide use until the next Meeting of the Parties. Many of these countries were previously strong proponents of a total phase-out of methyl bromide, with no previous nominations for exemptions. Clearly, these countries were reacting to the concessions the United States received, responding with protectionist measures of their own to help their domestic industries amid global competition (see Gareau 2008).

The strength of U.S. influence in international environmental deliberations will come as a shock to no one reading this journal. Nor will this explanation of U.S. concern that binding global environmental agreements can hinder national economic interests. There is substantial proof that tackling some of the world’s most dire ecological problems, such as global climate change, will affect the carbon-intensive economy of the United States in the short term more than many other countries in the core of the world-system (Cf. Nordhaus and Boyer 2000; York et al. 2005; Roberts and Parks 2007). What remains disconnected in the environmental politics literature, however, is why, exactly, the United States feels this and similar global agreements – such as those on global climate change – will hinder its long-term economic condition. The larger historically-based structural conditions facing the United States and the economic conditions of certain institutions and influential powers within the country are left out of the (largely political science-based) literature on international environmental agreements. Why, for instance, does the United States choose policies that err on the side of potential global environmental destruction over potential global environmental sustainability? Why does the European Union (EU), another global power, appear highly interested in accelerating the methyl bromide phase-out while the United States works towards deceleration? These are questions that cannot be answered with an explicit evaluation of the Montreal Protocol at the regime level, but rather require a broader analysis of the United States vis-à-vis the political economy of the world-system. Without understanding this larger context, analyses of environmental treaties remain incomplete.

## Literature Review: World-Systems Analysis of Development and Global Environmental Governance

*“Issues of development persistently spill over into environmental ones.”* (Roberts and Parks 2007: 26)

Roberts and Parks (2007) have made the salient point that most of the scholarship on global environmental governance fails to take seriously the historically-contrived structure of the world-system and the effect it has on environmental negotiations. Nation-states enter environmental agreements with different “material and ideational preferences” that shape how they negotiate, which has been noted in international regime scholarship (e.g., Young 1999; Müller 2001). But “without understanding the origin of those preferences, it is hard to say how stable they are or under what conditions they might shift” (Roberts and Parks 2007: 29). In short, these structures are very stable, deeply rooted in years of uneven development, global inequality, unequal ecological exchange, colonialism, and imperialism.

While regime commentators point to the lack of capacity of LDCs to negotiate aptly in the global setting (due to a lack of resources, be those expertise, finances, number of delegates, etc.), Roberts and Parks (2007) suggest that the root set-back is global inequality, the “gaping divide in global wealth” that makes it extremely difficult for nations in the periphery to cooperate with those in the core (26). The peripheral nations have beliefs about the way the global economy is structured, and those beliefs are deeply rooted in years of exploitation of one form or another. In addition, they are keenly interested in developing their economies in order to achieve higher standards of living. This division – material and ideational – seems to contradict much of the world polity scholarship claiming that global environmental regimes bring nations together in a “world culture” that increases global cooperation on environmental issues.

World polity theory aims to provide an explanation for how certain cultural and political traits become disseminated worldwide. It is “an institutionalist approach that explains the unexpectedly high and rising levels of isomorphism among states as a function of embeddedness in a singular and universalist ‘world polity’” (Beckfield 2010: 1019). Through embeddedness in the world polity, it is argued, nation-states and other actors learn which actions are legitimate and which contrast with the world culture (Boli and Thomas 1997; Meyer et al. 1997). For example, researchers have shown that nation-states with abundant ties to the world polity (through, for example, membership in international NGOs and intergovernmental organizations such as the IMF, World Bank, WTO, or the UN) prescribe environmental laws and regulations more rapidly than do less embedded nations (Frank 1999; Frank et al. 2000; Schofer and Hironaka 2005). Yet some scholars have argued that world polity theory does not adequately take into account the gap between international environmental commitments and meaningful implementation or actual environmental improvements (e.g., Buttel 2000). Simply put, states embedded in the world polity might rapidly establish environmental laws, but that does not mean that they intend to implement those laws. On this ground, Schofer and Hironaka (2005) have shown that environmental improvement can occur when the intergovernmental organizations and treaties that disseminate the environmental action are strongly supported by the global community over a significant period of time (see also Dietz and Kalof 1992; Zahran et al. 2007). For instance, Schofer and Hironaka (2007) argue that environmentalism in the world polity was likely successful in eradicating ozone-depleting chlorofluorocarbons (CFCs) under the Montreal Protocol, and not successful in reducing carbon dioxide emissions (CO<sub>2</sub>), in part because the ozone cause was

more long-lasting and supported for a longer period of time by the world polity structure, nation-state citizenry, and firms (37).

In response, critics point out that world polity theory seldom considers the roles that power and inequality play in the establishment of global norms (Smith 2000; Beckfield 2003; Beckfield 2010), and that these attributes can help explain why certain treaties work and others do not. For instance, some intergovernmental treaties clearly benefit global powers, and thus they are implemented and made to be effective (Boswell and Chase-Dunn 2000). It could be argued, for instance, that CFC eradication via the Montreal Protocol, while a consequence of public pressure to protect the ozone layer, was also a profitable move for the chemical industry, which strongly contributed to its success (cf. Parson 2003; Gareau 2010). Such a dichotomy leads some scholars to employ a synthetic approach that acknowledges the cohesive nature of the world polity, its embeddedness, and the legitimization of world cultural norms, but also the “material and symbolic struggles” that still occur on the global stage (Beckfield 2003: 404). Embeddedness may be present, but it is still a conflict-driven process in which some actors hold more sway than others, thus creating a world society with structural privileges (Beckfield 2003: 417). Material divisions and global inequality between the zones of the world-system make “environmental cooperation” next to impossible.

The historical nature of the world-systems approach allows us to see how deeply entrenched differences between the core, semi-peripheral, and peripheral zones truly are. However, an aspect left unexplored in the literature on global environmental governance – international relations and world-systems alike – is the effect that political and economic shifts among core nations have on the environmental governance processes. As we know from world-systems scholarship, the core, while being relatively stable, is not static, and the world system eventually shifts development in ways that brings to the surface potent rivalries amid the status quo. Thus, hegemonic power shifts over time. Therefore, environmental imperialism and ecologically unequal exchange are both historically researched realities (e.g., Roberts 2001; Grimes and Kentor 2003; Roberts and Parks 2007, Ch. 5; Clark and Foster 2009; Jorgenson and Clark 2009; Foster, Clark, and York 2010; Moore 2010), as are the harms perceived by the periphery which affect how they engage in global environmental governance (Roberts and Parks 2007). By the same token, shifts in global hegemony are also historically researched realities (e.g., Wallerstein 1974, 2003; Arrighi 1994; Gowan 1999), and these hegemonic shifts likely shape quite significantly the ways that core nations engage in global environmental governance.

The world-system approach aids in understanding the potentiality of global environmental regimes, because it links the current state of global affairs with the historic trends from whence they emerge. This approach necessarily pays close attention to the role that global powers play in shaping the global economy in ways that inevitably lead to a shift in global power. Accordingly, the role of the US today is an important focus in world-systems scholarship. Since the 1980s, world-systems scholars have begun to focus centrally on the link between global environmental conditions and the history of global development, and consequently linking the potential for making global development more sustainable through analyses of socio-ecological historical process (e.g., Bunker 1984; Bartley and Bergesen 1997; Foster and Magdoff 2000; Moore 2003; Chew 2007; Hornborg and Crumley 2007; Jorgenson and Kuykendall 2008). In the mid-1980s, for instance, Stephen Bunker (1984) famously employed a world-system approach to describe the historic link between Brazil’s resource extraction for exports under colonial regimes and its consequential underdeveloped status (1020). Bunker noted that extractive economies are at a global disadvantage: whereas commodity production costs tend to

fall as the scale of production increases in non-extractive systems, the opposite is true for extractive systems. The depletion of non-renewable (or slowly-renewing) resources coupled by a lack of in-country links (i.e., export enclaves) and weak in-country civil society groups all add up to less development (Bunker 1984: 1058-59).

A country's economic and social history as a peripheral nation also affects how it engages in environmental politics. While not a world-systems scholar, Peluso uses an historical lens to understand why some less-developed states use the guise of international environmentalism to support the appropriation of resources from its marginalized citizens and then "appropriate the moral ideology of global conservation to justify state systems of resource extraction and production" (Peluso 2004: 347). For Peluso, the current economic and social policies of developing countries are strongly tied to their colonial past vis-à-vis global environmental policy. Despite decolonization, "world market linkages continue to influence the decision of former colonies by increasing the returns of market activities to the national elites who control the trading links" (Peluso 2004: 347). Understanding the history of a country's state-society and state-global economy sheds light on the reasons why certain states empowered by international environmental policy turn resource conservation into "the commercial exploitation of resources" (Peluso 2004: 355; see also Guha and Martinez-Alier 2000).

Indeed, to think that global environmental policy is exempt from the influence of global economic (and military) powers would be ahistorical. Lipschutz and Conca (1993) and Lipschutz and Mayer (1996) clearly show that "the security concerns of states and the profit motives of multinational corporations (MNCs) incline both to disregard environmental protection unless pressed by environmental movements and non-governmental organizations (NGOs)" (in Mitchell 2002: 501). Arrighi (1994) provides a more sophisticated framework for understanding the global economic context in which global environmental regimes are embedded. This framework reveals the differential character of that which Lipschutz and others note about state and multinational corporation (MNC) inclinations. In other words, the difference between states lies partly in the kind of state that exists – i.e. how connected the state apparatus is to the global economy, and to various facets of civil society. In *The Long Twentieth Century*, Arrighi (1994) uses the concept of hegemony both in and beyond the traditional Gramscian sense – the establishment and maintenance of domination of one social group over others via "intellectual and moral leadership," whereby the "supremacy of a social group" is supported by consent, or, when consent is low, by force and corruption (consensus sheltered by the so-called "armor of coercion") (Gramsci 1971). Inflating the concept to the global scale, Arrighi (1994) recognizes more than corruption and fraud in the 'grey areas' of weakened hegemonic power; that is, hegemony also implies that other social and national powers perceive that the continuance of the hegemon is in fact to their own benefit. When it is not, the hegemon falls.

What is helpful here for fully understanding global environmental regimes is Arrighi's analysis of shifts in global power by assessing shifts in economic activity. This also includes analysis of the state to identify how powerful states control production and investment and how finance shifts power away from extant hegemons. This process is basically an historical cycle of material-based production/accumulation conducted under the aegis of the hegemonic power. Consequently, the hegemon, in conjunction with capitalist interests, develops a potentially innovative way to expand accumulation through financialization. This leads to a surge in capital investment in finance of alternative productive systems. This period, dominated by financial expansion is not accompanied so much by territorial expansion as by the flexible expansion of capital, for instance, U.S. "flexible production." Financial expansion gives rise to breaks from

past forms of accumulation, restructures the global economy, and threatens – and eventually topples – economic hegemony.

Recent economic data support Arrighi's model of the rise and decline of hegemony, and the actuality that the US is making financial decisions that reflect its hegemonic decline (if not military decline; see Wallerstein 2004). In the United States, direct and long-term investments currently have a net outflow, foreign banks are currently funding close to half of the national account deficit (an unprecedented 47 percent as of January 2011),<sup>4</sup> productive investment is low, and U.S. imports are much larger than exports (ergo, growth will only widen the deficit; see Barnes 2004: 72; Treasury.gov 2011; Treasurydirect.gov 2011). Importantly, unlike the Bretton Woods system, under which the United States had a current-account surplus, the country is weakened by a current-account deficit while being supported by foreign federal banks, particularly Asian central banks, that buy treasuries to finance the U.S. deficit. With a growing national deficit, these Asian powers may soon worry about the value of their dollar reserves (*The Economist* 2004b: 72; Foster 2009). Moreover, there are significant global contenders that can provide the material capital needed for further accumulation. China, for example, has the capacity to increase drastically its material, direct investment, which has been extending its urbanization effort to inland China since the early 2000s (*The Economist* 2004a) and fund the U.S. deficit via further investment in US treasuries (*The Economist* 2004c; Wallerstein 2004). Thus, Arrighi's method allows for an historical analysis of contemporary global events, which currently aids in the analysis of the United States as its military campaigns attempt to stave off threats to its fragile hegemony at the same time as it tries to maintain investment in US industry and finance (see also Wallerstein 2003; Harvey 2003).

Although Arrighi's framework is largely focused on macroeconomics and geopolitics, this approach can help us understand global environmental agreements. One could argue, for instance, that the U.S. financial concerns are intricately tied to its global environmental policy. The Bush administration pulled out of or weakened several global environmental agreements with the rhetoric that they would hinder the country's industrial efforts. Subsequently, the Obama administration has made no gesture to improve the U.S. role in said agreements. World-systems analysis suggests that the United States is acting in ways to help prolong its domination of the global economy. Foster (2002), for example, provides an overview of the U.S. role in the Kyoto Protocol, the legally binding agreement designed to reduce greenhouse gas emissions in industrialized countries (13-22). Since the inception of the Kyoto Protocol in 1997, the United States tried to minimize its economic impact by requesting permits for tradable emissions and allowances for carbon sinks. It also requested the National Academy of Sciences (NAS) to assess the scientific validity of the UN Inter-governmental Panel on Climate Change (IPCC, a panel of the world's top climatologists) to determine if the IPCC "had somehow created a politically determined set of conclusions not merited by the underlying science – or worse still, that the science had been politically tampered with," as several industry-backed lobbies such as the Global Climate Coalition (GCC) had argued (Foster, 2002: 15).<sup>5</sup> Yet, the NAS found no such evidence, and the United States was forced to admit the genuine reason for its aversion to the Kyoto Protocol: jobs and unfair advantages for developing countries (like China) not included under the provisions of greenhouse reductions until a later date (see also Nordaus and Boyer 2000).

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<sup>4</sup> China owns over \$1.1 trillion in United States treasuries, or 26 percent of all foreign-held United States debt.

<sup>5</sup> The GCC was a group of businesses that worked to deny climate change science mainly in the 1990s. The IPCC's 2001 report on the seriousness of global climate change basically led to the dissolution of this group (Revkin 2009).

These efforts to undermine the imperatives of the Kyoto Protocol are similar to a pattern found in the Montreal Protocol. The United States has stressed economic concerns in relation to the uneven phase-out of methyl bromide between industrialized and industrializing nations. World-systems analysis would implicate competition between the United States and rival production platforms as the likely reason for U.S. demands for “critical-use exemptions” for methyl bromide. U.S.-based chemical industry lobbyists and farmer coalitions are historically powerful political actors in the U.S. economy threatened by competing agricultural sectors in Mexico, Europe and China, including in the strawberry industry (Friedman 1982; Carter et. al. 2005; Ragan 2005; Sideman 2005). In this case, regional agro-industrial production platforms in California and Florida joined forces with elements of the U.S. state, effectively ‘jumping’ to the global scale and stalling the progress of the Montreal Protocol via economic and political power and influence over the state apparatus. As one anonymous U.S.-based industrial lobbyist exclaimed to me at the 2004 First Extraordinary Meeting of the Parties to the Montreal Protocol—a meeting designed explicitly to decide how to deal with US requests for critical use exemptions—“Baja California [Mexico] is flooding the damn market [with strawberries] as far as I am concerned!” This reveals how US agro-industrial interests sought to take advantage of U.S. hegemonic influence in order to advance their interests and undercut competition. Gareau (2008; 2010) shows how the United States often complained at Montreal Protocol meetings that developing countries would have an unfair advantage in strawberry and tomato production if they were able to continue the use of methyl bromide while the United States was forced to use less productive alternatives. In this case, it appears that the United States wants to have its cake and eat it too: maintaining a highly developed industrial strawberry production complex that it fears is only globally dominant if it is able to use methyl bromide while subjecting other countries to the rules of the Protocol. Although studies on methyl bromide alternatives funded by the Montreal Protocol’s Multilateral Fund have proven them to be successful, the United States argues that these projects did not consider seriously the economic conditions in which core nation farmers must operate or their unique climatic and soil conditions that do not allow for methyl bromide alternatives (cf. Gareau 2008). Here, not only local political powers, but the very *spatial conditions of production* jump to the global scale to represent the local interests of capital (cf. Swyngedouw 2004).

That is not all. The United States has openly questioned whether methyl bromide scientific experts operating in the Montreal Protocol are acting politically in favor of other nations, although expert bodies of the Protocol contain experts from the developed and the developing world (Gareau forthcoming). As stated in the introduction, at the 16<sup>th</sup> Meeting of the Parties in Prague, the United States openly accused the methyl bromide expert group to the Protocol, the Methyl Bromide Technical Options Committee (MBTOC), of drawing political lines on how much methyl bromide should be included in exemptions to the phase-out date (discussed in more detail below).<sup>6</sup>

Gareau and DuPuis (2008) show how this is a reflection of the intense debate that exists between the EU and the United States. The EU has taken great efforts to phase out methyl bromide, often voicing its concerns over the high amounts of critical uses requested by the United States. For example, at the closing ceremony of the 2003 15<sup>th</sup> Meeting of the Parties, a meeting which ended in a standstill between the United States and other countries opposed to U.S. critical use nominations for methyl bromide, the EU delegation stated that phasing out methyl bromide as soon as possible was their ‘top priority’ and that critical use exemptions

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<sup>6</sup> This is similar to the United States’ accusations against the IPCC in the Kyoto Protocol.

should decrease each year. Indeed, the EU has now completely shifted to methyl bromide alternatives while the United States is still slowly transitioning to alternatives on its own terms (Mayfield and Norman 2012). The difference between these two regions is likely tied to U.S. concerns over increased investment in European methyl bromide-free strawberry production (which would allow producers therein to sever their dependence on the expensive U.S.-produced patented strawberry varieties), its tie to cheap labor in Spanish and Moroccan strawberry production, and potential links between European investment in Chinese strawberry production at the expense of the U.S. methyl bromide-dependent strawberry production platforms (; USDA Foreign Agricultural Service 2002a, 2002b, 2004, 2005a, 2005b; Carter et. al. 2005; FAO 2005; Goodhue et. al. 2005; Ragan 2005; Sideman 2005; Zhang et al. 2006; Gareau 2008). Much of the details of this global competition in the strawberry sector, as well as its organic sector, are still unknown and understudied, but it is clearly a growing threat in the eyes of many agro-industrial lobbyists and farmer coalitions in the US (Borrego 2008; Fruitnet 2009; Gareau and Borrego 2012).

Here, the world-systems approach prompts us to consider the scalar differences between historical forms of globalization within the global context. In terms of environmental treaties, this means that the very structure of the treaties, their links to science, nation-states, NGOs, corporations and local communities can be compared over space and time. Environmental treaties are established by countries in order to extend production and organize consumption in a way that, ostensibly, is friendly toward the environment (however the treaty might define “environment”). The manner in which those countries enter a treaty is influenced by the historical and spatial form of industrialization that is predominant therein and their position in the global economy. Kenya’s gross domestic product, for instance, contains a large agriculture component, a sizable proportion of which is in flower production, a sector with a history of methyl bromide use. This fact has undoubtedly affected the way Kenya engages in ozone politics around pesticide use and alternatives to certain pesticides that might threaten their production, as does the strength of industrial, civil society, and agrarian groups in Kenya.

### **Agriculture and Hegemony**

Approaches that consider long-term trajectories are able to situate particular events in a larger scheme of causal relationships. For instance, we discussed how one articulation of the U.S. attempt to maintain its hegemony consists of that country vigorously trying to extend its use of ozone-depleting substances in general and methyl bromide in particular, while much of the world resists this extension, albeit to varying degrees. In fact, the United States went so far as to threaten to withdraw from the treaty were its demands not met (Gareau forthcoming). While the situation is complex, the causes of the US position may resemble (here in microcosm) historical moments in which past global powers fought off their competition. For instance, Arrighi (1994) points out that the contradiction of U.S. hegemony is that it is one of unrivalled military power and “near-monopoly of the legitimate use of violence on a world scale,” but is financially dependent on the confidence of foreign powers – governmental and private – vis-à-vis the U.S. market. If the United States is attempting to hold on to certain ODSs in order to maintain control of a portion of its agrochemical/industrial production, it is possible that it is doing so in other sectors of industry. Indeed, the U.S. pullout from the Kyoto Protocol and its substantial Farm Bill strongly support this conclusion. This situation is consistent with shifts in hegemonic rule in

the past, such as the shift in economic flows from the Dutch model of capital accumulation via mercantilist production for export (ship-building, printing, construction via Hollandries, etc.) to that of English colonialist territorial expansion. In this regard, it is hard not to think of China – boosted by its wealth of investment and of venture capital and by lenient environmental policies allowed by its “less-developed” status – providing the territorial, labor, and financial pathways to a new hegemonic regime.<sup>7</sup>

From this perspective, the position of the United States in the global regulatory arena is partially dependent upon the state’s relationship with private corporations, and their consequential relationship with labor and the general populace. Ever since U.S. policy shifted from “Keynesian” social welfare to neoliberal economics, the relationship between labor and firms has been tenuous at best. Yet, with agriculture the labor-capitalist relationship has *always* been tenuous. For instance, most agricultural workers in California are migrants from Mexico, with few rights and even fewer social or political networks to bolster their negotiating power (most strawberry workers are not unionized).<sup>8</sup> The strong state-agricultural sector relation that was initiated as part of New Deal politics in the 1930s may still be influencing the United States to engage in international environmental agreements to their economic advantage. The United States, then, may see the shift away from methyl bromide as a threat to its strong control over global agricultural production with protectionist subsidization; but, more importantly, farmer and agro-chemical coalitions find it necessary to use their influence at the global scale to maintain dominance at the expense of the stratospheric ozone layer.

Similar to the “mode of regulation” of agriculture in France, U.S. agriculture is based on a “technical, economic, and social organization of production directed entirely towards a rapid and intensive industrialization of agriculture” (Allaire and Mollard 2002: 215). It enjoys consistent public support, but it also faces deep global economic pressures. For the United States, strawberry production was able to create a ‘growth regime’ in strawberry production largely due to the value added to the production chain by methyl bromide, a technology embedded in every aspect of US strawberry production, from the varieties created by the University of California and private agricultural institutions to the shelf-life of the product (Runstan 1987; Bertelsen 1995; Sances and Ingham 1997; Halprin and Broome 2000; Goodhue et. al. 2005; Muramoto et. al. 2005). This relationship created a “regime of accumulation” that is all but exhausted, at least in the sense that global competition is opening up competitive strawberry production around the globe and global environmental agreements (and the global civil society groups involved with them) demand the end of methyl bromide. Yet it most likely also means that U.S. agrochemical firms want to use up enormous methyl bromide stockpiles prior to any phase-out date. If the overall economic situation in the United States is weakening, then it may lack the political and economic clout to counter the negative economic effects of ODS phase-outs with more protectionist subsidization. The answer the Bush and Obama administrations have given is to ignore or weaken global environmental treaties.

Industrialized countries like the United States have the capacity to shape the decision-making process of the Montreal Protocol due to their political and economic power, but this alone does not explain how the United States is able to exert its power in convincing ways during international treaty negotiations. At the Montreal Protocol, typical US practice is to join forces

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<sup>7</sup> Such a regime may not necessarily be dictated directly by China, but rather by global powers influencing production and consumption in China and East Asia in general.

<sup>8</sup> In fact, U.S. labor law does not protect agricultural workers very much at all, and worker organization in the sector has been largely unsuccessful.

with groups often associated with the state and regional scales through the politics surrounding the condition of California strawberry production. As Gareau (2008) shows, at the 24<sup>th</sup> OEWG of the Montreal Protocol, these powerful lobbies demonstrated their ability to ‘jump scale’ and virtually reconfigure international environmental policy to their advantage. The California Strawberry Commission, the spokesperson for California’s strawberry growers, indicated that “alternatives [to methyl bromide] do not work well on hillsides and heavily sloped fields,” and the U.S. delegation stated that “regulatory restraints on alternative pesticides [to methyl bromide] can limit their use” in the United States. Both of these positions strongly influenced the current framework of the Montreal Protocol, providing evidence that local institutions with political power at the national level can successfully scale up their agendas to the international level. Through the world-systems approach, we see the local articulation of this construction in the global context, where the search for comparisons across different scales, and not studies of place, reveals sources of unity in struggles against global economic pressures. It should be clear that the United States’ actions at the Montreal Protocol are intimately tied to the pressures it faces from the globalization of agricultural production. The solution may be for emerging core and semi-peripheral zones to stand firm against the United States (much as Brazil has done in WTO deliberations) and demand that it abide by Protocol guidelines. Declining U.S. global economic hegemony vis-à-vis competing agricultural zones might be pressure enough, where non-compliance with the Montreal Protocol would be environmentally disastrous and would close markets from U.S. exports.

In terms of the Montreal Protocol, U.S. insistence on using methyl bromide can be viewed three ways. One, it demonstrates the age-old measure taken by powerful, industrialized countries to maintain control over agriculture and industry within their own borders. The bulk of production remains in the “core” nations, and provides leverage for the core to dictate the flows of capital and abuse its balance of payments (Brenner 2003). Two, it shows the potential weakness of the US state, which fears losing control of agrarian and agro-chemical production to the global South and the EU. Unlike in the case of CFCs, the United States does not foresee a viable alternative for methyl bromide that will simultaneously maintain revenue and support global environmental sustainability (Cf. Gareau 2008; Gareau and DuPuis 2009). Or three, if it is the sign of a declining hegemon, then it must be so vis-à-vis a stronger international monopoly sector, the chemical industry, or vis-à-vis a stronger EU, which has worked hard to force the United States to ban the use of its environmentally destructive ODS, such as methyl bromide in strawberry production and hydrochlorofluorocarbons (HCFCs) in its metered dose inhalers (Gareau forthcoming). Two of the three largest producers of methyl bromide, for instance, are U.S. firms, and the United States is historically the largest consumer of methyl bromide (Mayfield and Norman 2012).

As Weiss (1997) indicates, policy instruments indeed change, are taken away from states, or need adjustment to boost economic integration, but this could just as easily be a sign of *policy weakness*, not necessarily state weakness (see also Lipschutz and Conca 1993; Litfin 1994; Ronit and Schneider 1999; Murphy and Gouldson 2000; Cashore 2002). Facilitative states, such as most of the Western European states and Japan, seek to establish agreements with other states that would allow them to expand the horizons of domestic business. These states create ways for local corporations to broaden their operations to other parts of the world as part of an agreement, for instance, to obtain positions in the foreign bureaucracy, or to obtain foreign market share. However, the U.S. position in global environmental agreements, such as the critical use exemptions of methyl bromide in the Montreal Protocol, demonstrates a different, hegemonic

role as facilitator. The U.S. effort to continue its use of methyl bromide beyond the globally agreed limit of 2005 is a form of protectionism aimed at stopping the loss of control of production vis-à-vis the globalization of environmental policy rather than facilitation to expand the agro-business potential of its domestic businesses. The strength of the state in Weiss's description might be translated in this case to the United States using the Montreal Protocol as a vehicle to dictate policy in order to improve its position in the global market.

U.S. opposition to the consensus of global environmental politics illustrates a case where a dominant state feels threatened by transnational forces that can shift agricultural production away from the United States to other parts of the world that can use more chemicals, hire cheaper labor, and produce commodities amid fewer environmental regulations like those operating in earlier-industrialized nations. Why else would the United States pull out of the Kyoto Protocol, and threaten to pull out of the Montreal Protocol? These policies threaten to reduce the space for competitive industrial and agro-industrial production that has advantaged the core zone. These are the spaces where industries function as dominant – but contested – players in globalization. The U.S. hold on the global economy is linked to its control of agro-industrial production, and this control is seen as threatened by environmental agreements like the Kyoto and Montreal Protocols. Rather than innovate in response to new information and changing international contexts, industry actors have drawn upon U.S. hegemony to enforce their dominant market positions.

## **Conclusion**

As we have seen, world-systems analysis provides insights into the historical origins of uneven ecological exchange, which shapes present inequities worldwide. Roberts and Parks (2007) convincingly argue that these material, structurally-based inequities in the world-system have created deeply-rooted feelings of mistrust among peripheral nations, making cooperation on global environmental agreements extremely difficult to achieve. Without reducing global inequity, we cannot expect much from global environmental governance. Where such agreements have been successful in the past, such as in ozone politics, they have often provided ample financial opportunities for core-based industries (Gareau 2010), as well as financial incentives for LDCs, what Roberts and Parks (2007) refer to as “compensatory justice”:

It is important to note that [The Montreal Protocol] did not spontaneously emerge from a socially shared understanding of ‘appropriate’ principles among nations, as the logic of social constructivism would suggest. Rather, developing nations bargained hard for the side payments – environmental aid, technical assistance, and technology transfer – that would help them comply with their negotiated obligations. China and India, in particular, sent clear and credible signals that they would not participate in an ozone regime without financial compensation. (46)

The George H. W. Bush administration, however, made very clear that compensatory justice would not become a mainstay in global environmental governance, and such a condition has yet to be replicated at such grand a scale (Roberts and Parks 2007: 47). And subsequent U.S. administrations have followed suit.

Recent failures in the Montreal Protocol show how powerful actors are able, because of the convergence between their interests and that of the United States, to ‘jump scale’ from the local/regional conditions of production to the global in order to influence decision-making. In the methyl bromide controversy, the California agro-industry has a powerful asset in the US’s interest in maintaining this production platform. There are clear signs that countries in the semi-periphery, such as India, Brazil, China, and Western Europe are becoming (in different ways) major threats to the U.S. agro-industrial platform, which is clearly affecting global environmental agreements such as the failed Doha Round of the World Trade Organization (Diaz-Bonilla et al. 2006; McMichael 2009; Prichard 2009), and the Montreal Protocol. The turmoil in these multilateral negotiations both signals and contributes to the decline of US hegemony in the global economy.

There is a distinct possibility that the ‘green growth’ policies promoted by many groups and nations attending and influencing the Rio+20 Conference<sup>9</sup> will serve to further disunite the core and peripheral zones. Although it is perhaps too early to speculate, the ‘green growth’ concept that was prominent in the Rio+20 Summit attempts to extend the notion that economic growth and sustainability are compatible, provided that markets remain or become liberalized (e.g., Salleh 2012). The UNEP’s *Green Economy Report*, for instance, suggests that, the greening of economies is not generally a drag on growth but rather “has the potential to be a new engine of growth,” that it is “a net generator of decent jobs, and a vital strategy for the elimination of persistent poverty” (UNEP 2011: 16). According to the report, states have generally agreed that sustainable development “should not become a pretext for non tariff barriers to trade, increasing trade protectionism and aid conditionalities” (UNEP 2011: 24; Gabizon 2011). On the whole, the UNEP report suggests “to motivate policy makers to *create the enabling conditions* for increased investments in a transition to a green economy” (UNEP 2011:16, emphasis added).

This rhetoric seems to match that of green neoliberalism, where markets are opened in the South for the benefit of the protected North while environmental governance supports the process in various ways (cf. Goldman 2005; McCarthy 2012). Yet global inequality must be reduced, for without greater equity further global environmental protection is unlikely. Additionally, the material conditions of the global South rightfully deserve to be improved, something upon which green neoliberals and critical environmental sociologists agree:

Poor and middle-income countries know full well that their environment is degraded, their cities sprawling and their water supplies running out. They also know that to try to solve such problems by cutting growth would be to commit political suicide and condemn today’s poor to a hopeless future. Green growth offers the best hope that the countries facing the sharpest conflicts between prosperity and preserving the environment can square the circle. (*The Economist* 2012)

However, the direction of ‘green growth’ requires an understanding of the material and ideational conditions of the modern world-system, especially the reality of hegemonic shifts. We argue that NGOs and other global civil society groups would do well to support the establishment of local/regional civil society groups operating in zones of hegemony-contestation, such as in China.

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<sup>9</sup> Rio+20 refers to the twenty-year follow-up to the 1992 UN Conference on Sustainable Development, held in June of 2012.

While it is clear that China is a site of massive environmental degradation (Foster 2009), it is also potentially a site of ecologically-sane production (Arrighi 2007; Ho 2009; Gareau and Borrego 2012). In a very short period of time, China has become the world's largest site of organic farming, through both state support and foreign direct investment (Gareau and Borrego 2012). While organic commodity-production is not in itself necessarily sustainable, and can be rife with social issues such as labor exploitation, unsustainable resource extraction, export-oriented production, and the like, the organic model is potentially carbon-friendly and can be made to harness agroecological techniques that promise to improve socio-ecological conditions (Foster and Magdoff 2000; Kovel 2003). True, China's focus on export-oriented growth in organics threatens to continue reorganizing traditional productive relations and decreasing food security of rural communities whilst increasing tolls on water supplies and other socio-ecological resources. Growing labor shortages and civil unrest, however, might force China to consider food sovereignty, small farms, and diversity (Altieri 2009) in organic production, which could lead to the development of a state-led regional production platform worthy of replication (cf. Trichur 2012). The key here would be to strengthen civil society groups, groups that are essential for provoking states to take environmentalism seriously, both locally and globally, in order to support the emergence of a "green hegemony" (Keck and Sikkink 1998; Tarrow 2001; Kaldor 2003; Roberts and Parks 2007).

Studies of environmental movements in authoritarian contexts show that such movements often end up working for human rights and other democratic goals in addition to their environmental agendas, including in China (Economy 2010). Indeed, China's civil society model might be more potentially emancipative in terms of socio-ecological conditions of production that is commonly surmised in the West. While civil society in China operates very differently due to the authoritarian nature of the state, environmental groups have begun to make some ground. Partly, this is because the Chinese government acknowledges that it is losing a great deal of gross domestic product to environmental degradation, therefore making environmentalism a key agenda item for the state (*The Economist* 2012). However, at the same time, "a vibrant environmentalist sector has sprung up in Chinese society" with relative autonomy and movement success: "Instead of a better overview and control by the state, [new state] policies and regulations have led to civil society and voluntary green organizations vanishing from the state's gaze, as they fail to register" (Ho 2001: 914). Therefore, China's environmental groups are different from many of their Western counterparts, reflecting, perhaps, a nuanced form of civil society amid a shifting (green) hegemony: "Green social organizations are increasingly courting government approval and influence in policy-making, rather than seeking a potentially dangerous confrontation with the national state. This is not true at the local level: open confrontation of environmentalists with local officials is sometimes even encouraged by the central state, as it is regarded as a way to overcome 'local protectionism'" (Ho 2001: 917). China, as an increasingly important participant in global environmental (and economic) governance and potential locus of both transnational association and capital, might plausibly become a vibrant site for transnational activism (cf. Smith and Wiest 2005; Coleman and Wayland 2006). For example, Economy (2010) found that international treaties and officials helped environmental groups in China gain protection and leverage. Thus, China's increasingly influential role in global governance might work to garner green hegemony, especially as it becomes more influential in international environmental treaties that the US is seeking to undermine/weaken. It seems imperative that global civil society groups assist in these efforts, for the betterment of local socio-ecological conditions, and for the sake of the planet.

Of course, this is speculative. More immediately, the international community must decide how to handle the United States' determination to maintain hegemonic control in global environmental governance. How the United States intervenes in global environmental treaties parallels its intervention in global policy in general: with a big stick. This is strikingly different from the way the EU, for instance, engages in environmental policy, which I believe explains some of the stark differences between civil society influences in those two regions (cf. Jasanoff 2005). On the other hand, the strength of EU civil society groups – represented via the EU in international plenary sessions of environmental treaties – might effectively force the United States to adopt a greener position in Montreal Protocol provisions by limiting its access to the European market. In a 2004 Montreal Protocol meeting, the EU blocked the passage of a policy that would allow the United States to produce more Salbutamol (a CFC) for metered dose inhalers (MDIs). The EU noted that it has been 12 years since essential use decisions regarding MDIs have been updated. The EU also noted that the US has too much CFC use and production, and wants to have all EU and U.S. essential uses for CFCs re-evaluated. As such, the EU was not willing to approve CFCs for MDIs for the United States in 2006. In plenary, the U.S. delegation harshly accused the EU of blocking this policy because of the US position on methyl bromide critical use exemptions (Gareau forthcoming).

The global community may wish to re-think its strategy of taking a lenient stance on U.S. demands to continue producing and consuming environmentally harmful chemicals and increasing its greenhouse gas emissions. Allowing the United States to maintain the status quo may inadvertently prolong U.S. economic dominance via environmentally destructive policies, and it allows for the perpetuation of global inequality (Roberts and Parks 2007). The different policy orientations of the EU and the United States is not limited to a single chemical, or group of chemicals; it is based on the level of desire for change, most likely intensified by civil society pressure that is able to jump scale with its institutional and political connections to the state. It is also highly influenced by their different positions in the global economy. The United States finds itself in a position of declining economic hegemony, whereas the EU, China, and other zones may foresee growing potential in adopting sustainable alternatives and/or attracting investment counter to the U.S. industrial complex. For example, in 2003, the EU tried to pass legislation that would accelerate the process of declaring chemicals ODSs and consequently, phasing them out of existence. The EU commented at the 2003 Open-ended Working Group meeting of the Montreal Protocol that the procedure for introducing new substances into the Montreal Protocol regime takes too long and needs amendment. The only solution open to the United States may soon be compliance with the Montreal Protocol, or its withdrawal from this legally binding agreement – something it has threatened in plenary is a distinct possibility in 2003. However, in the current global political economic milieu, with the United States ostensibly attempting to repair its relations with Europe, the latter solution may be an implausible, or at least unwise, choice.

This analysis also holds lessons for civil society actors. By understanding and addressing the complex, overlapping interests between industry, U.S. hegemony, and the conditions of a shifting world-system, social movements can help push global powers to challenge US positions while advancing alternative approaches toward a more equitable – and ecologically sane – future.

## References

- Allaire, G. and A. Mollard. 2002. "Sector-Based *Régulation*." Pp. 214-222 in *Régulation Theory*, edited by R. Boyer and Y. Saillard. New York: Taylor and Francis.
- Andersen, S.O., K.M. Sarma, and L. Sinclair. 2002. *Protecting the Ozone Layer*. London: Earthscan Publications.
- Andersen, S.O., K.M. Sarma, and Kristen N. Taddonio. 2007. *Technology Transfer for the Ozone Layer: Lessons for Climate Change*. Sterling: Earthscan.
- Arrighi, G. 1994. *The Long Twentieth Century: Money, Power, and the Origins of Our Times*. New York: Verso.
- , 2007. *Adam Smith in Beijing: Lineages of the 21<sup>st</sup> Century*. New York: Verso.
- Bankobeza, G.M. 2005. *Ozone Protection*. The Netherlands: Eleven Publishing.
- Barnes, M. 2004. "Re-assessing the Dollar Outlook." *The Bank Credit Analyst*, December.
- Bartley, T. and Bergesen, A. 1997. "World-System Studies of the Environment." *Journal of World-Systems Research* 3: 369-380.
- Beckfield, J. 2003. "Inequality in the World Polity: The Structure of International Organization." *American Sociological Review* 68(3): 401-424.
- , 2010. "The Social Structure of the World Polity." *American Journal of Sociology* 115(4): 1018-1068.
- Benedick, R.E. 1998. *Ozone Diplomacy*. Cambridge: Harvard University Press.
- Bertelsen, D. 1995. The U.S. Strawberry Industry. *Rep. Statistical Bulletin* 914. Washington, D.C.: US Department of Agriculture Economic Research Service.
- Boli, J. and G.M. Thomas. 1999. *Constructing World Culture: International Nongovernmental Organizations Since 1875*. Stanford: Stanford University Press.
- Borrego, J., C. Shennan, B.J. Gareau, et al. 2008. "Agents of Change: Environmental Governance, Competition, and Sustainability in Global Strawberry Production: NSF Grant Proposal No. 0827330." Washington, D.C.: National Science Foundation.
- Brenner, R. 2003. *The Boom and the Bubble*. New York: Verso.
- Brown, M. 2003. "Study Examines Politics of Methyl Bromide at Local and Global Levels." *The Cultivar* 21: 7-8.
- Bunker, S.G. 1984. "Modes of Extraction, Unequal Exchange, and the Progressive Underdevelopment of an Extreme Periphery: The Brazilian Amazon, 1600-1980." *American Journal of Sociology* 89: 1017-64.
- Buttel, F. 2000. "World Society, the Nation-State, and Environmental Protection." *American Sociological Review* 65: 117-21.
- California Coastkeeper Alliance. 2011. "Notice of Call for Public Comment on Fumigant Iodomethane Petition (Methyl Iodide)." Fremont California Coastkeeper Alliance, (<http://www.cacoastkeeper.org/document/protect-california-communities-and-ecosystems-from-methyl-iodide.pdf>).
- California Department of Pesticide Regulation. 1990-1992. Annual Pesticide Use Reports, State of California Environmental Protection Agency, Sacramento.
- , 1996. *Monterey County Pesticide Applicators Fined for Pesticide Misuse*. (<http://www.cdpr.ca.gov/docs/arc/hives/pressrsls/1996/monterey.htm>).
- Californians for Alternatives to Toxics. 1994. *TRICON*. (<http://www.alternatives2toxics.org/tric.htm>).

- Carter, C.A., J.A.Chalfant, and R.E. Goodhue. 2005. "China's Strawberry Industry: An Emerging Competitor for California?" *ARE Update* 9: 7-15.
- Cashore, B. 2002. "Legitimacy and the Privatization of Environmental Governance: How Non-State Market-Driven (NSMD) Governance Systems Gain Rule-making Authority." *Governance: An International Journal of Policy and Administration* 15: 503-29.
- Chew, S.C. 2007. *The Recurring Dark Ages*. Lanham: Altamira Press.
- Clark, B. and J.B. Foster. 2009. "Ecological Imperialism and the Global Metabolic Rift: Unequal Exchange and the Guano/Nitrates Trade." *International Journal of Comparative Sociology* 50(3-4): 311-334.
- Conca, K. 2006. *Governing Water*. Cambridge: MIT Press.
- Conca, K. and G.D. Dabelko. 2004. *Green Planet Blues*. Boulder: Westview Press.
- CorpWatch. 2004. *Pesticides*. (<http://www.corpwatch.org/article.php?list=typeandtype=118>).
- DeCanio, S. and C.S. Norman. 2005. "Economics of the 'Critical Use' of Methyl Bromide Under the Montreal Protocol." *Contemporary Economic Policy* 23: 376-393.
- Dietz, T., and L. Kalof. 1992. "Environmentalism among Nation-States." *Social Indicators Research* 26(4): 353-366.
- DuPuis, E.M., and B.J. Gareau. 2008. "Neoliberal Knowledge: The Decline of Technocracy and the Weakening of the Montreal Protocol." *Social Science Quarterly* 89(5): 1212-1229.
- The Economist*. 2004a. "China's Growth Spreads Inland." 373: 13.
- The Economist*. 2004b. "Passing of the Buck?" 373: 71-73.
- The Economist*. 2004c. "Unnaturally Low." (<http://www.economist.com/node/3219537>).
- The Economist*. 2012. "Green Growth: Shoots, Greens and Leaves." (<http://www.economist.com/node/21556904>).
- Economy, E. 2010. *The River Runs Black: The Environmental Challenge to China's Future*. Ithaca: Cornell University Press.
- Evans, P. 1997. "The Eclipse of the State? Reflections on Stateness in an Era of Globalization." *World Politics* 50: 62-87.
- FAO. 2005. *Fresh Strawberry Production Statistics*. UN Food and Agriculture Organization.
- Foster, J.B., B. Clark, and R. York. 2010. *The Ecological Rift: Capitalism's War on the Earth*. New York: Monthly Review Press.
- Foster, J.B. and F. Magdoff. 2000. "Liebig, Marx, and the Depletion of Soil Fertility: Relevance for Today's Agriculture." In *Hungry for Profit: The Agribusiness Threat to Farmers, Food, and the Environment*, edited by F. Magdoff, J.B. Foster, and F. Buttel. New York: Monthly Review Press.
- Foster, J.B. and F. Magdoff, eds. 2000. *Hungry for Profit: The Agribusiness Threat to Farmers, Food, and the Environment*. New York: Monthly Review Press.
- Foster, J.B. 2002. *Ecology Against Capitalism*. New York: Monthly Review Press.
- Foster, J.B. 2009. "A Failed System: The World Crisis of Capitalist Globalization and Its Impact on China." *Monthly Review* 60(10). (<http://monthlyreview.org/2009/03/01>).
- Foster, P. 2009. "Chinese Premier Wen Jiabao Worried about US Debt." *The Telegraph*. Accessed January 27, 2012. (<http://www.telegraph.co.uk/finance/g20-summit/4984924/Chinese-premier-Wen-Jiabao-worried-about-US-debt.html>).
- Frank, D. 1999. "The Social Bases of Environmental Treaty Ratification, 1900-1990." *Sociological Inquiry* 69: 523-50.
- Frank, D., A. Hironaka, and E. Schofer. 2000. "The Nation-State and the Natural Environment of the Twentieth Century." *American Sociological Review* 65: 96-116.

- Friedmann, H. 1982. "The Political Economy of Food: The Rise and Fall of the Postwar International Food Order," in *Marxist Inquiries*, edited by M. Burawoy and T. Skocpol. Chicago: University of Chicago Press.
- Fruitnet. 2009. "China's Strawberry Production Increase." Accessed August 8, 2010. ([www.fruitnet.com/content.aspx?ttid=11&cid=3809](http://www.fruitnet.com/content.aspx?ttid=11&cid=3809)).
- Gabizon, S. 2011. "Update of the Rio+20 Official Process." *Rio+20 Portal: Building the People's Summit Rio+20*. Accessed November 10, 2011 (<http://rio20.net/en/documentos/update-of-the-rio20-official-process>).
- Gareau, B.J. 2008. "Dangerous Holes in Global Environmental Governance: The Roles of Neoliberal Discourse, Science, and California Agriculture in the Montreal Protocol." *Antipode* 40(1): 102-130.
- , 2010. "A Critical Review of the Successful CFC Phase-out Versus the Delayed Methyl Bromide Phase-out in the Montreal Protocol." *International Environmental Agreements: Politics, Law, and Economics* 10(3): 209-231.
- , 2012. "The Limited Influence of Global Civil Society in the Montreal Protocol." *Environmental Politics* 21(1): 88-107.
- , Forthcoming. *From Precaution to Profit: Contemporary Challenges to Environmental Protection in the Montreal Protocol*. New Haven: Yale University Press.
- Gareau, B.J., and E.M. DuPuis. 2009. "From Public to Private Global Environmental Governance: Lessons from the Montreal Protocol's Stalled Methyl Bromide Phase-Out." *Environment & Planning* 41(10): 2305-2323.
- Gareau, B.J. and J. Borrego. 2012. "Global Environmental Governance, Competition, and Sustainability in Global Agriculture." Pp. 357-365 in *Handbook of World-Systems Analysis*, edited by S. Babones and C. Chase-Dunn. New York: Routledge.
- Goldfrank, W. 2000. "Paradigm Regained? The Rules of Wallerstein's World-System Method." *Journal of World-Systems Research* 11: 150-195.
- Goldman, M. 2005. *Imperial Nature: The World Bank and Struggles for Social Justice in the Age of Globalization*. New Haven: Yale University Press.
- Goodhue, R.E., S.A. Fennimore, and H.A. Ajwa. 2005. "The Economic Importance of Methyl Bromide: Does the California Strawberry Industry Qualify for a Critical Use Exemption from the Methyl Bromide Ban?" *Review of Agricultural Economics* 27: 198-211.
- Gowan, P. 1999. *The Global Gamble*. New York: Verso.
- Gramsci, A. 1971. *Selections from the Prison Notebooks*. New York: International Publishers.
- Grimes, P. and J. Kentor. 2003. "Exporting the Greenhouse: Foreign Capital Penetration and CO<sub>2</sub> Emissions 1980-1996." *Journal of World-Systems Research* 9(2): 261-275.
- Guha, R., and J. Martinez-Alier. 2000. *Varieties of Environmentalism: Essays North and South*. London: Earthscan.
- Haas, P.M. 1992. "Banning Chlorofluorocarbons." *International Organization* 46: 187-224.
- Halprin, L. and J. Broome. 2000. "SAREP Strawberry Projects: Working on Alternatives to Methyl Bromide." *Sustainable Agriculture* 12: 4-10.
- Harvey, D. 2003. *The New Imperialism*. Oxford: Oxford University Press
- , 2006. *The Limits to Capital*. New York: Verso.
- Ho, P. 2001. "Greening without Conflict? Environmentalism, NGOs and Civil Society in China." *Development and Change* 32: 893-921.
- Jasanoff, S. 2005. *Designs on Nature: Science and Democracy in Europe and the United States*. Princeton: Princeton University Press.

- Jorgenson, A.K. and B. Clark. 2009. "The Economy, Military, and Ecologically Unequal Exchange Relationships in Comparative Perspective: A Panel Study of the Ecological Footprints of Nations, 1975-2000." *Social Problems* 56(4): 621-646.
- Jorgenson, A.K. and K.A. Kuykendall. 2008. "Globalization, Foreign Investment Dependence and Agriculture Production: Pesticide and Fertilizer Use in Less-Developed Countries, 1990-2000." *Social Forces* 87: 529-560.
- Kaldor, M. 2003. *Global Civil Society: An Answer to War*. Malden, MA: Polity Press.
- Kaniaru, D., ed. 2007. *The Montreal Protocol: Celebrating 20 Years of Environmental Progress*. London: Cameron May Ltd.
- Keck, M.E. and K. Sikkink. 1998. *Activists Beyond Borders*. Ithaca: Cornell University Press.
- Kiely, R. 1998. *Industrialization and Development*. London: UCL Press.
- Kovel, J. 2000. "The Struggle for Use Value: Thoughts About the Transition." *Capitalism, Nature, Socialism* 11(2): 3-23.
- Lipschutz, R.D. and K. Conca. 1993. *The State and Social Power in Global Environmental Politics*. New York: Columbia University Press.
- Lipschutz, R. and J. Mayer. 1996. *Global Civil Society and Global Environmental Governance*. Albany, NY: SUNY Press.
- Litfin, K. 1994. *Ozone Discourses*. New York: Columbia University Press.
- Mayfield, E.N. and C.S. Norman. 2012. "Moving away from Methyl Bromide: Political Economy of Pesticide Transition for California Strawberries since 2004." *Journal of Environmental Management* 106(15): 93-101.
- McCarthy, J. 2012. "The Financial Crisis and Environmental Governance 'After' Neoliberalism." *Tijdschrift voor Economische en Sociale Geografie* 103(2): 180-195.
- McMichael, P. 2009. "A Food Regime Genealogy." *Journal of Peasant Studies* 36(1): 139-169.
- Meyer, J., D.J. Frank, A. Hironaka, E. Schofer, and N.B. Tuma. 1997. "The Structuring of a World Environmental Regime: 1870-1990." *International Organization* 51: 623-51.
- Moore, J.W. 2003. "Nature and the Transition from Feudalism to Capitalism." *Review: The Journal of the Fernand Braudel Center* XXVI: 97-172.
- Moore, J.W. 2010. "'This Lofty Mountain of Silver Could Conquer the Whole World': Potosí and the Political Ecology of Underdevelopment, 1545-1800." *Journal of Philosophical Economics* IV(1): 58-103.
- Mitchell, R. 2002. "International Environment." Pp. 500-516 in *Handbook of International Relations*, edited by T. Risse, B. Simmons and W. Carlsnaes. London: Sage Publications.
- Müller, B. 2001. "Varieties of Distributive Justice in Climate Change." *Climatic Change* 48: 273-288.
- Muramoto J., S.R. Gliessman, S.T. Koike, C. Shennan, et al. 2005. *Maintaining Agroecosystem Health in an Organic Strawberry/Vegetable Rotation System (Part 4): The First Four Years*. The ASA-CSSA-SSSA International Annual Meetings, Section on Sustainable Cropping Systems: From Earthworms to Mapping Local Food Capacity. Salt Lake City. Sponsor: A08 Integrated Agricultural Systems.
- Murphy, J. and A. Gouldson. 2000. "Environmental Policy and Industrial Innovation: Integrating Environment and Economy Through Ecological Modernisation." *Geoforum* 31: 33-44.
- Ning, L. 2007. "Illegal Trade in Ozone Depleting Substances: Asia and Pacific Region." United Nations Environmental Programme. (<http://www.mearen.org/files/publications/Illegal%20Trade%20in%20ODS.pdf>).
- Nordhaus, W. D., and J. Boyer. 2000. *Warming the World*. Cambridge: MIT Press.

- Ozone Secretariat. 2003. Opening Statement by the UNEP Ozone Secretariat. *23rd Open-ended Working of the Montreal Protocol*. Montreal Canada
- Parson, E. 2003. *Protecting the Ozone Layer: Science and Strategy*. Oxford: Oxford University Press.
- Peluso, N.L. 2004. "Coercing Conservation." In *Green Planet Blues*, edited by K. Conca and G.D. Dabelko. Boulder: Westview Press.
- Prichard, B. 2009. "The Long Hangover from the Second Food Regime: A World-Historical Interpretation of the Collapse of the WTO Doha Round." *Agriculture and Human Values* 26(4): 297-307.
- Ragan, T. 2005. "Looking for Methyl Bromide Alternatives: P.V. Strawberry Growers Say Pesticide is Essential to Production." *Santa Cruz Sentinel*, 1 December.
- Revkin, A.C. 2009. "Industry Ignored its Scientists on Climate." *The New York Times*, 23 April. ([http://www.nytimes.com/2009/04/24/science/earth/24deny.html?\\_r=1](http://www.nytimes.com/2009/04/24/science/earth/24deny.html?_r=1)).
- Roberts, J.T. 2001. "Global Inequality and Climate Change." *Society and Natural Resources*. 14(6): 501-509.
- Roberts, J.T. and P.E. Grimes. 1998. "World-Systems theory and the Environment: Toward a New Synthesis." *Second Woudschoten Conference of the ISA's Research Committee on Environment and Society*. SISWO, University of Amsterdam: International Sociological Association.
- Roberts, J.T. and B.C. Parks. 2007. *A Climate of Injustice: Global Inequality, North-South Politics, and Climate Policy*. Cambridge: MIT Press.
- Ronit, K. and V. Schneider. 1999. "Global Governance through Private Organizations." *Governance: An International Journal of Policy and Administration* 12: 243-266.
- Runstan, D. 1987. "Competition in Strawberries: Competitiveness at Home and Abroad." A Report of 1986-87 Study Group on: Marketing California Specialty Crops: Worldwide Competition and Constraints. Sponsored by the University of California Issues Center, Davis, CA.
- Salleh, Ariel. 2012. "'Green Economy' or Green Utopia: The Salience of Reproductive Labor Post-Rio+20." *Journal of World-Systems Research* 18(2): 141-145.
- Sances, F.V. and E.R. Ingham. 1997. "Conventional and Organic Alternatives to Methyl Bromide on California Strawberries." *Compost Science and Utilization* 5: 23-37.
- Schofer, E., and A. Hironaka. 2005. "The Effects of World Society on Environmental Protection Outcomes." *Social Forces* 84(1): 25-47.
- Shandra, J.M., E. Shor, and B. London. "World Polity, Unequal Ecological Exchange, and Organic Water Pollution: A Cross-National Analysis of Developing Nations." *Human Ecology Review* 16(1): 53-63.
- Smith, J. 2000. "Review of Constructing World Culture: International Nongovernmental Organizations Since 1875." *Social Forces* 78: 1573-1575.
- Smith, J. and D. Wiest. 2005. "The Uneven Geography of Global Civil Society: National and Global Influence on Transnational Association." *Social Forces* 84(2): 621-652.
- Speth, J.G. 2005. *Red Sky at Morning*. New Haven: Yale University Press.
- , 2008. *The Bridge at the End of the World: Capitalism, the Environment, and Crossing from Crisis to Sustainability*. New Haven: Yale University Press.
- Sideman, R. 2005. "Strawberry Growers Seek China Market." *The Register-Pajaronian*, 4 December.
- Strange, S. 1995. "The Defective State." *Daedalus* 124: 55-74.

- Swyngedouw, E. 2004. "Scaled Geographies: Nature, Place and the Politics of Scale." Pp. 129-153 in *Scale and Geographic Inquiry: Nature, Society and Method*, edited by E. Sheppard and R. McMaster. Oxford: Blackwell.
- Tarrow, S. 2001. "Transnational Politics: Contention and Institutions in International Politics." *Annual Review of Political Science* 4(1): 1-20.
- Treasury.gov. 2011. "Major Foreign Holders of Treasury Securities." 15 April. Accessed January 27, 2012. (<http://www.treasury.gov/resource-center/data-chart-center/tic/Documents/mfh.txt>).
- Treasurydirect.gov. 2011. Monthly Statement of the Public Debt of the United States. 31 January. Accessed January 27, 2012. (<http://www.treasurydirect.gov/govt/reports/pd/mspd/2011/opds012011.pdf>).
- Trichur, G.K. 2012. "East Asian Development Path and Land-Use Rights in China." *Journal of World-Systems Research*. 18(1): 69-88.
- UNEP. 2011. *Green Economy Report: Towards A Green Economy: Pathways to Sustainable Development and Poverty Eradication*. ([www.unep.org/greeneconomy](http://www.unep.org/greeneconomy)).
- United Nations Development Programme. 1999. *Global Environment Outlook*. UNEP.
- USDA Foreign Agricultural Service. 2002a. GAIN Report Spain Strawberries Annual 2002, United States Department of Agriculture Foreign Agriculture Service.
- , 2002b. GAIN Report: China Frozen Strawberries. United States Department of Agriculture Foreign Agriculture Service.
- , 2004. GAIN Report: China Strawberries Annual 2004. United States Department of Agriculture Foreign Agricultural Service.
- , 2005a. GAIN Report: China Frozen Exports. United States Department of Agriculture Foreign Agricultural Service.
- , 2005b. GAIN Report: Mexico Strawberries Annual 2005. United States Department of Agriculture Foreign Agriculture Service.
- U.S. Department of State. 2012. "Methyl Bromide Critical Use Nomination for Preplant Soil Use for Strawberry Fruit Grown in Open Fields (Submitted in 2012 for the 2014 Use Season)." File Name: USA CUN14 Soil Strawberry Fruit Open Field. Washington, D.C.: Bureau of Ocean and International Environmental and Scientific Affairs.
- Wade, R. 1983. "South Korea's Agricultural Development: The Myth of the Passive State." *Pacific Viewpoint* 24: 11-29.
- Wallerstein, I. 1974. *The Modern World System*. New York: Academic Press.
- , 2003. *The Decline of American Power*. New York: The New Press.
- , 2004. *China and the U.S.: Competing Geopolitical Strategies*. (<http://fbc.binghamton.edu/commentr.htm>).
- Wollan, M. 2012. "Maker Pulls Pesticide amid Fear of Toxicity." *The New York Times*, 21 March.
- Weiss, L. 1997. "Globalization and the Myth of the Powerless State." *New Left Review* 225: 3-27.
- WMO/UNEP. 2002. Executive Summary, Scientific Assessment of Ozone Depletion: 2002. Prepared by the Scientific Assessment Panel of the Montreal Protocol on Substances that Deplete the Ozone Layer.
- Young, O. 1994. *International Governance: Protecting the Environment in a Stateless Society*. Ithaca: Cornell University Press.

- , 1999. "Fairness Matters: The Role of Equity in International Regime Formation." Pp. 247-263 in *Global Ethics and the Environment*, edited by N. Low. London: Routledge.
- , 2002. "Can New Institutions Solve Atmospheric Problems? Confronting Acid Rain, Ozone Depletion and Climate Change." Pp. 87-91 in *Challenges of a Changing Earth: Proceedings of the Global Change Open Science Conference, Amsterdam, The Netherlands, 10-13 July 2001*, edited by W. Steffen, J. Jager, D.J. Carson, and C. Bradshaw. New York: Springer.
- York, R., E.A. Rosa, and T. Dietz. 2005. "The Ecological Footprint Intensity of National Economies." *Journal of Industrial Ecology* 8(4): 139-154.
- Zahran, S., E. Kim, X. Chen, and M. Lubell. 2007. "Ecological Development and Global Climate Change: A Cross-National Study of Kyoto Protocol Ratification." *Society & Natural Resources* 20: 37-55.
- Zhang, Z., Q. Wang, and X. Zhao. 2006. "A General Survey of the Development of the Production and Trade of Strawberry Both at Home and Abroad." *China Fruit and Vegetable* 2006(1): 6.