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## **Banking Nature?**

**The financialisation of environmental conservation<sup>1</sup>**

**Sian Sullivan<sup>2</sup>**

*Birkbeck College, London*

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*In addressing the challenge of achieving global sustainability, we must apply the basic principles of business. This means running “Earth Incorporated” with a depreciation, amortization and maintenance account.*

Statement by Maurice Strong, Secretary General at the 1972 UN Conference on the Human Environment in Stockholm and the 1992 Earth Summit in Rio, and first Executive Director of the United Nations Environment Programme (UNEP), in a 1996 lecture to the Korea Institute for International Economic Policy, Seoul.<sup>3</sup> Currently reproduced on the website for EKO Asset Management Partners ([www.ekoamp.com](http://www.ekoamp.com)), a ‘merchant bank’ for environmental markets.<sup>4</sup>



## **Introduction**

A recent special issue of the journal *Antipode* on capitalism and conservation,<sup>5</sup> introduced and edited by Daniel Brockington and Rosaleen Duffy, traces how what they call a capitalist ‘conservationist mode of production’ is emerging through consolidated alliances between business and environmental conservation. Alongside other key texts,<sup>6</sup> they emphasise the sustained effort on the part of conservation organisations to recruit business to the environmental cause. Coupled with this is a systemic revisioning of environmental sustainability as a new frontier for capital

expansion and revenue growth,<sup>7</sup> and of markets as the realm through which environmental damage can best be mediated, mitigated and governed. As such, the current combination of environmental and financial meltdowns are being constructed explicitly as creating business and investment *opportunities* in ‘sustainability’.

Brockington and Duffy assert additionally, however, that ‘[c]onservation has hardly been involved in the production of value through financialisation’.<sup>8</sup> Financialisation is the process whereby finance comes to dominate other activities in the economy. In post-manufacturing economies, financialisation has come to be the primary engine of economic growth and expansion, generating accumulation through financialisation, even as other economic areas are stagnating.<sup>9</sup>

My perception differs from Brockington and Duffy in that I think the contexts briefly described above actually are ushering in an *intense financialisation* of environmental governance for conservation, combined in part with the financialisation of environmental risk.<sup>10</sup> And interestingly, in recent months several academic opportunities have appeared seeking to research precisely this.<sup>11</sup>

I think of the financialisation of environmental conservation as taking two key forms. First, is the turning of banks and financiers to environmental parameters as a locus for expansion and investment. Second, is the modelling of both conservation practice and understandings of non-human natures in terms of banking and financial concepts. These are taking place in the context of two paradoxes. First, while it would seem that recent financial crisis should signal that finance markets had reached some sort of expansionary limit, subsequent bailouts with public money suggest instead that finance has been substantially reinforced, both in resources and in the power to command legitimising strategies by national governments.<sup>12</sup> Second, while apparent environmental crisis might be interpreted as signalling a developmental crisis of capitalism – *aka* James O’Connor’s ‘second

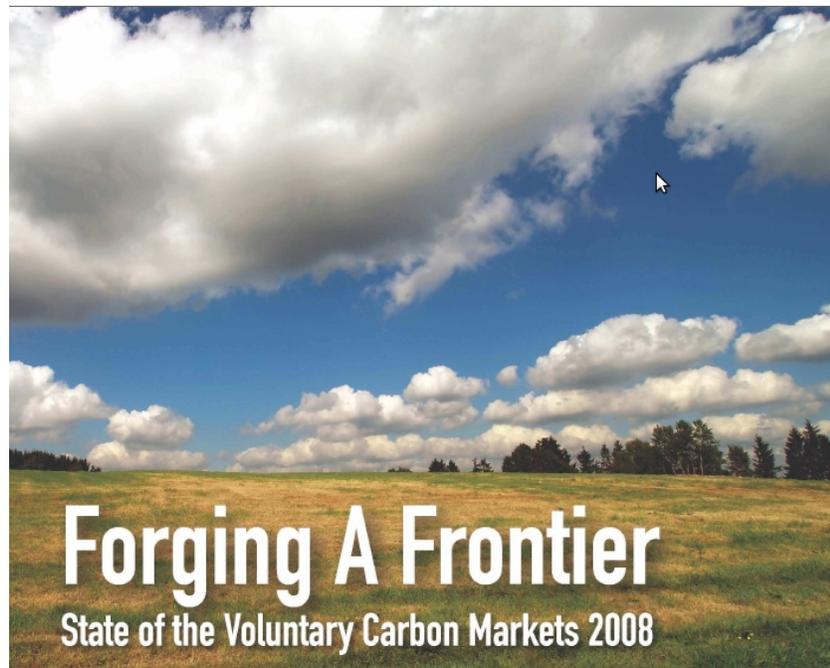
contradiction of capitalism' whereby capitalism putatively undermines its own possibilities for accumulation by depleting its required material and metabolic base<sup>13</sup> – it is instead becoming an accumulation frontier for capitalism, precisely through relationships with finance and capital investment. Both financial and environmental crises thus are entwined in ways that strengthen, rather than reduce, the power of finance capital.

As Jason Moore writes, the consequent emerging 'financialisation' of environmental crisis and protection extends 'the penetration of finance into everyday life, and above all into the reproduction of extra-human nature' as a key feature of capitalism in its current guise as neoliberalism.<sup>14</sup> As such, financialisation has critical structuring effects in all realms of life, composing new and resistant socionatures.<sup>15</sup> It is thus ripe for anthropological study. New layers of financialisation pose challenges for the sustenance of local ecological knowledges and 'biocultural diversities'. They rationalise human and non-human natures to conform with a particular economic system that privileges price over other values, and profit-oriented market exchanges over the distributive and sustainable logics of other economic systems.<sup>16</sup> And by assuming people to be individual utility-maximisers and private property to be the norm, they are simplifying cultural diversity and arguably are contributing to critical transformations of biological, linguistic, cultural and epistemological diversities globally.<sup>17</sup>

This paper is an attempt to both delineate and theorise some of these effects in the arena of environmental conservation. It is structured into four remaining sections. First, I draw attention to the ways that environmental crisis and conservation are being created as a spectacular frontier for capital investment. I follow Anna Tsing<sup>18</sup> who observes that 'the self-conscious making of a spectacle is a necessary aid to gathering investment funds' and 'a regular feature of the search for finance capital', and I detail several ways that finance capital, in collaboration with conservation agendas, is constructing such a spectacular frontier in environmental conservation.

In the next section I offer a brief survey of the emerging financialisation of environmental conservation. I focus on four aspects of this process: the production of nature finance, nature work, nature banking and nature derivatives. My third section constitutes a theorisation of these entwined phenomena. I apply current thinking regarding the continuous nature of primitive accumulation as delineated by Marx, to explain the impetus towards investment in the new frontier of environmental conservation and to consider its likely effects. I follow this with a Foucaultian framing of the current financialisation of environmental conservation as extending the technical and biopolitical entraining of environmental governance to the controlling tenets of neoliberal capitalism. I close with a brief conclusion.

### **Creating the spectacular new frontier of environmental conservation**





Source: [http://ecosystemmarketplace.com/documents/cms\\_documents/2008\\_StateofVoluntaryCarbonMarket.4.pdf](http://ecosystemmarketplace.com/documents/cms_documents/2008_StateofVoluntaryCarbonMarket.4.pdf)

For finance to 'operationalise' the accumulation opportunity of environmental crisis and conservation, products and commodities connecting these domains need to be created that permit new investment, trade and speculation. As Martin O'Connor writes in the 1990s, nature needs to be 'capitalised' and 'capital ecologized' in new ways.<sup>19</sup>

Or, to paraphrase Morgan Robertson's recent work,<sup>20</sup> *capital needs to create new natures that it can see*. This requires that the earth-in-crisis is rethought and reworded such that it is brought further into alignment, conceptually, semiotically, and materially, with capital.

The attraction of financial investment to the creation of both new products and new markets for the profitable exchange of these products, requires the spectacular creation of an investment frontier. Tsing notes that new investment frontiers are made through the productive use of spectacle, requiring combinations of dramatic performance, as well as of conjuring tricks in the opening up of unforeseen

possibilities. As she states, ‘the more spectacular the conjuring, the more possible an investment frenzy’.<sup>21</sup> Speculators conjure potential to create commodity bubbles attractive to investors, which although often based on multiple layers of product abstraction can have significant social and material effects. The spectacular frontier of environmental conservation is no different and I want to highlight three mutually reinforcing mechanisms of its creation.

First, are the repetitive utterances of the spectacular financial returns deemed possible through the exchange of new environmental conservation products. Since ecological economist Robert Costanza and colleagues famously estimated the annual ‘value’ globally of ‘ecosystem services’ and ‘natural capital’ to be \$16-54 trillion, affirmations of nature’s dollar value have proliferated.<sup>22</sup> Costanza *et al.* were attempting to draw attention to ways that exclusion of environmental factors as externalities in conventional economic analyses misrepresented the cost of environmental impacts of development activities. This has been rapidly transformed, however, into an optimistic embrace of the returns that might be captured if this ‘value’ of environmental externalities can be priced and traded. Statements now abound of the spectacular promise of new markets in products intending to signify environmental degradation and conservation, in terms of returns to both investors/traders and to ‘the environment’. The environmental consultancy firm Advanced Conservation Strategies states on its website, for example, that ‘[b]y 2030, Carbon will be the largest commodity market in the world: \$1.6-2.4 trillion, about the same as the current oil market’,<sup>23</sup> and it is easy to find many such assertions of the potential dollar value of emerging commodities that are based on some appeal to environmental conservation.

The promise of this new equation of nature with money is marked by the proliferation of powerful images conveying nature as money. As shown below, for example, a 2007-8 UNEP and IUCN (International Union for the Conservation of Nature) document on payments for ecosystem services (PES) features an image of

verdant green foliage amongst which various currency notes appear as 'leaves'.<sup>24</sup> This is echoed in the 2009 logo of the United Nation's Environment Programme's (UNEP) current New Green Deal initiative, which depicts a delicate young green plant, shooting up from a pile of Euro coins.<sup>25</sup> Bombardment by text and images displaying a unitary discourse that nature's value can be captured adequately through application of money's signs, is a powerfully manipulative means of marketing, and thereby composing, this 'reality'.



Sources: [http://www.unep.ch/etb/areas/pdf/IPES\\_IUCNbrochure.pdf](http://www.unep.ch/etb/areas/pdf/IPES_IUCNbrochure.pdf);  
<http://www.unep.org/greeneconomy>

This constitutes the *opening* of a new investment frontier. For this fledgeling frontier to grow, i.e. to attract more interest and investment, it needs to become pregnant with promise. In the financialised world of environmental conservation, this second aspect of frontier creation is constituted by the conjuring of a spectacularly proliferating range of new products and trading possibilities. These are based on unforeseen abstractions of non-human nature and the consequent opening up of new niches for investment. Key to this is the *infinite substitutability* posited by the notion of a global environment as a sort of abstract 'global ledger' that can be essentialised into new definable and exchangeable parts, permitting offsetting trades in newly commoditised measures of environmental health and degradation.

This is made possible through two key interconnected routes. First, is the creation of *increasingly derived tradable products* through the addition of layers of abstraction to commoditised signifiers of nature health and degradation. Second, is the constructing of *tradable equivalence* between previously non-exchangeable entities and distant localities. This conceptual mechanism releases any brakes on the creation of environmental conservation commodities that can be traded between localities.

Until recently, for example, the possibility of an emerging global trade in carbon emissions, would have seemed strange and surreal. This is now entrenched and familiar. The market trade in carbon manifests in various ways, significant ones being: 1. trade in the ‘free gift’<sup>26</sup> to industrial emitters of government allocated emissions quotas (i.e. ‘carbon credits’) (e.g. under the European Union Emissions Trading Scheme (UE ETS)); and 2. purchase of standing biomass (normally in the global south), which, under expansionary carbon accounting practices such as REDD (Reducing Emissions from Deforestation and Degradation, [www.un-redd.org](http://www.un-redd.org)), increasingly is becoming conceived as carbon ‘sinks’ for the voluntary ‘offsetting’, or dumping, of carbon emitted elsewhere.<sup>27</sup>

Within the international policy frame that opens the possibility of this trade (the Kyoto Protocol of the United Nations Framework Convention on Climate Change (UNFCCC)), work to create and stake claims to carbon has been conducted by ‘[b]rokers, consultants, carbon procurement funds, hedge fund managers and other buyers’, who have ‘scoured the globe for opportunities to buy credits associated with projects that reduce emissions in developing countries’.<sup>28</sup> A recent paper in *Conservation and Policy* thus states that ‘the acquisition of carbon offsets will be the biggest financial investment in the environmental sector to date’;<sup>29</sup> and current heat over REDD, is indicative of policy and business excitement over the potentially lucrative linkage of carbon offsets with the carbon stored in standing biomass. An

accompanying array of derivative products increases possibilities for greater financial returns on this trade, extending its reach into the complex and intractable realm of 'mad money'<sup>30</sup> associated with derivatives trading, hedge funds and futures markets. Stock exchanges existing only to service trade in carbon products now exist in London ([www.ecx.eu](http://www.ecx.eu)) and Chicago ([www.chicagoclimatex.com](http://www.chicagoclimatex.com)), and are emerging in Montreal ([www.mcx.ca](http://www.mcx.ca)), China ([www.chinatcx.com.cn](http://www.chinatcx.com.cn)), and Australia ([www.envex.com.au](http://www.envex.com.au)). The organisation running these exchanges, Climate Exchange Plc ([www.climateexchangeplc.com](http://www.climateexchangeplc.com)), is itself a company whose shares are listed and traded on the London Stock Exchange, recently purchased for US\$ 395 million by the US-based energy and futures trader InterContinental Exchange (ICE).<sup>31</sup>

This proliferating trade in carbon products naturalises an idea critical for enhancing investment and trading possibilities at the conservation frontier. This is of the *equivalence* and *substitutability* of very different 'things' and 'environments', via essentialising reductions to a defined environmental measure, in this case the element of carbon. The carbon offset trade conceptually enables carbon production as one thing (e.g. industrial emissions) in one location, to be 'offset' against its storage in another qualitatively different thing (e.g. tropical forests) in another location. Through this the earth becomes conjured as a carbon matrix in which all production and activity is reduced to the concentration and exchange of the element of carbon. This innovation permits unintuitive confluences, as well as having profound implications for local socio-ecologies.

The possibility of using market exchanges to offset environmental damage in one location through investment in some measure of environmental conservation or restoration in another location, now is a feature of global environmental governance. Equivalent and accompanying offset trades are emerging in additional measures of biodiversity and habitat health. These are being pursued in collaborations between corporations, major environmental organisations and government regulators, to facilitate emergence of an array of new environmental offset commodities and

exchanges (outlined further below). The mining conglomerate Rio Tinto, for example, is working with Environmental NGOs (ENGOS) in Madagascar to create biodiversity offset schemes whereby the impacts of mining in one location will be 'paid for' by investing in biodiversity conservation in a different location.<sup>32</sup> As such, biodiversity offsets bring what has been termed 'the ultimate anti-commodity', i.e. biodiversity, into the mitigation *banking market*,<sup>33</sup> such that 'clearing of native vegetation may be allowed if offsets are established elsewhere in the landscape'.<sup>34</sup>

Ecologically then, these are designed to enable habitat loss through extractive industry. Geographically, they constitute a radical discounting of cultural and biophysical place-based specificities. What they do permit is a bringing forth of proliferating layers of possible finance accumulation through the bundling together of different environmental products that, as they are distinguished and capitalised, can begin to be banked, offset and traded in combination with each other. Bekessy and Wintle<sup>35</sup> make plain this opportunity in suggesting that carbon offsetters (i.e. investors in carbon sequestration landscapes), also might accrue biodiversity credits 'when the biodiversity benefits of a carbon-sequestration project can be demonstrated'.

Accompaniment by spectacularly dramatic performances and mediated presentations of environmental crisis, of the nature treasures that require conservation, and of conservation performance constitutes a third impetus in creating the frontier of environmental conservation investment. These combine to compose an environmental and conservation spectacle that both sets the scene for investment in environmental conservation, and acts to engender particular human and non-human natures as well as relationships between them.<sup>36</sup> The lucrative and proliferating investment frontier of trade in environmental conservation products thus is set against, and justified through, spectacular marketing of nature loss and value, and of conservation endeavour and conservationists.<sup>37</sup>

The recently released film *Hotspots*, made by the mega-ENGO Conservation International under the direction of celebrity conservation biologist Russell Mittermeir, brilliantly illustrates this production of conservation as spectacle.<sup>38</sup> The trailer spectacularly dramatises conservation work, using tropes of treasure, rarity and the exotic in signifying global localities of high biodiversity, and of crisis and threat in specifying the urgency of conservation work. This sets the scene for entrance of the story's leading actors: the heroic, predominantly white and male, conservation biologists, whose work is a military-style operation featuring long lensed cameras, helicopters, camouflage fatigues, a racy soundtrack and machismo. The cinematic experience thereby generated is similar to that of Hollywood portrayals of contemporary US military engagement in 'Third World' frontiers, echoing, for example, *Apocalypse now* (Vietnam) and *Black hawk down* (Somalia). The trailer closes with a deep male voice-over describing the protection of hotspots as 'the mother of all wars'. But alongside fighting to protect nature's treasures, CI is systematising its productive collaborations with corporate and financial worlds. It is run by a board of directors consisting largely of CEOs and other representatives from businesses such as Wal-Mart and Starbucks.<sup>39</sup> It works with business and finance<sup>40</sup> to seek offsetting solutions for industrial impacts in particular locations, as well as to realise conservation capital through monetising lands owned or purchased by corporations that exhibit newly priced 'ecosystems services'.<sup>41</sup> The dramatisation of natural history, environmental crisis and capitalist conservation endeavour, is further performed and *orchestrated* through spectacular events such as at the four-yearly IUCN World Conservation Congress<sup>42</sup> and the biannual Wildscreen natural history film festival in the UK.<sup>43</sup> At these meetings, corporate-conservation networks and empowered understandings of conservation issues and interventions are produced and reinforced.

As with any frontier of capital expansion, this created frontier of environmental conservation is making possible the penetration of finance into the ensuing new spaces for investment. It accompanies and is accompanied by a modelling and

conceptualisation of nature using banking categories to produce a proliferating range of new nature products that can be easily aligned with finance. I outline these entwined components of nature's financialisation in the following section, focusing on the categories of nature finance, nature work, nature banking and nature derivatives.

## **Banking nature**

### *Nature Finance*

The movement of financial investment into the world of environmental conservation and governance is the most direct means of conservation financialisation. Several tendencies are indicative of this movement and I outline a few of these here.

First, is a notable presence of new investment funds offering products and services linked with discourses and indices of environmental conservation and sustainability. The investment fund EKO Asset Management Partners, for example, is

... a specialized investment firm focused on discovering and monetizing unrealized or unrecognized environmental assets... in short, a “merchant bank” for the world of environmental markets.<sup>44</sup>

EKO's investors hail from the world of *haute finance* and include James Wolfensohn, 9<sup>th</sup> president of the World Bank Group, as well as Lord Jacob Rothschild and Alexander and Ben Goldsmith of the Rothschild and Goldsmiths banking dynasties.<sup>45</sup> Elsewhere on their website they state that EKO's approach is to:

stimulate the development of environmental markets' through aligning 'smart capital with people, projects, and companies that are poised to profit from emerging markets for ecosystem services, whether they be markets for carbon, for water quality, or for biodiversity.<sup>46</sup>

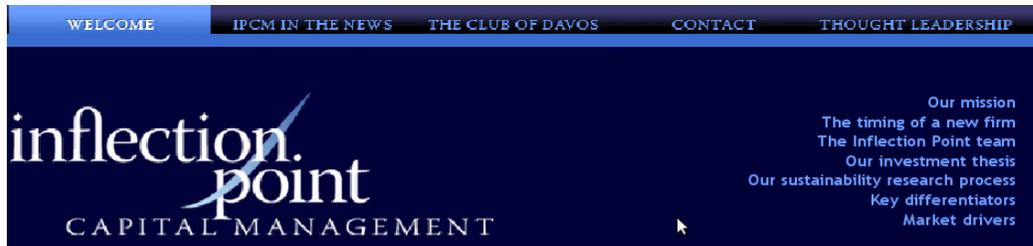
Investments are oriented towards, for example, towards:

land with undeveloped or unrecognized environmental assets with a view to developing these assets and profiting from their sale in emerging environmental markets'.<sup>47</sup>



Source: <http://www.ekoamp.com/>

The investment fund 'Inflection Point Capital Management', has a slightly different focus but environmental sustainability is emphasised as key for investment choices. The fund's website describes it as 'the world's first multi-strategy asset management boutique offering exclusively sustainability-enhanced investment products across a broad range of asset classes'.<sup>48</sup> The fund-managers identify 'recent market meltdown as a multi-trillion dollar "advertorial" for sustainability-enhanced approaches',<sup>49</sup> and aim to increase the 'sustainability alpha premium'<sup>50</sup> of company performance through incorporating proxy measures of 'sustainability performance' into investment practices, based on the proprietary database developed by associated company Innovest.



Welcome to Inflection Point Capital Management:  
the world's first multi-strategy asset management boutique  
offering exclusively sustainability-enhanced investment  
products across a broad range of asset classes.

Find out more about our [mission](#), our [firm](#) and our [team](#), our [investment thesis](#)  
and [what makes us unique](#).

Source: <http://www.inflectionpointcm.com/>

This fund is headed by Matthew Kiernan, acclaimed author of *Investing in a Sustainable World: Why Green is the New Colour of Money on Wall Street*,<sup>51</sup> former President of the World Business Council of Sustainable Development (WBCSD), and regular speaker at the annual Davos World Economic Forum. The cover of Kiernan's book displays a blue-green earth, half of which is subsumed by gleaming American quarter-dollar coins; an image echoing painted representations of the globe used in the 1500s and 1600s to depict the new commodity trades then bolstering an emerging European mercantile class.

Through work for JPMorgan via his previous company Innovest Strategic Value Advisors, Kiernan has been associated with the creation of index-linked corporate bonds, 'designed to enable credit investors to make return-driven investment decisions that systematically take into account the risks and opportunities created by global warming'.<sup>52</sup> Thus,



'[u]sing Innovest's proprietary database and applying an exacting methodology, [the] JENI [carbon-beta index] overweights the securities of issuers judged to have relatively lower risk due to climate change, and underweights issuers with relatively higher risks'.<sup>53</sup> Risk here is related to a firm's 'carbon intensity' (its vulnerability in the context of climate change and carbon regulation), with the index intending to signal firms preferable for investment in relation to carbon reductions, as well as those vulnerable to climate-change associated risks.

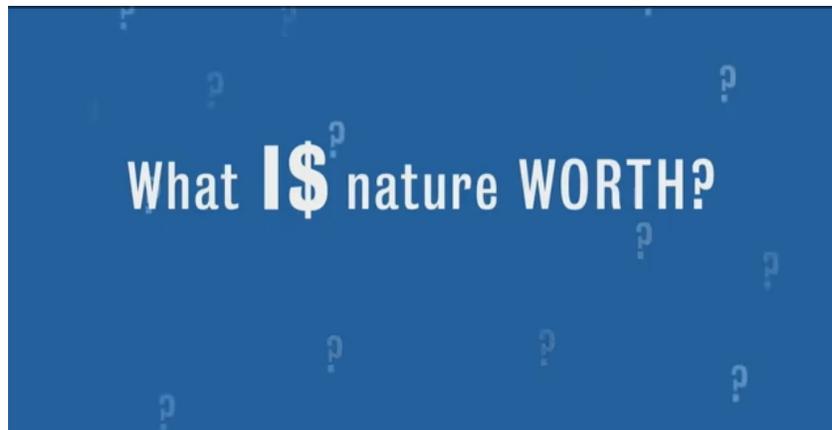
It is being proposed that index-linked carbon bonds might also be issued by governments, such that 'interest payments [from government to investors] are linked to the actual greenhouse gas emissions of the issuing country against published targets'.<sup>54</sup> This would enable investors to hedge against the risk of a government not meeting its carbon commitments, such that investors would receive 'an excess return if the issuing country's emissions are *above* the government's published target', and *vice versa*.<sup>55</sup> The rationale is that the issuing government then has an additional *incentive* to make sure national emissions targets are met, because this will enable them to pay lower interest rates to bonds issued to investors. Investors in turn would provide governments with cheaper debt *as long as* governments meet their emissions targets. The important point is the implication that private sector 'green financiers' would then be *governing*, or at least *disciplining*, governments on their carbon/climate policies, via the incentives built into the bond structure. This structurally shifts the locus of responsibility for global environmental outcomes into the incentivising domain of investment finance, and further entangles possibilities for emissions reductions with other competing domains of investment.<sup>56</sup>

Conventional banks also are turning their investment practices towards substantially integrating environmental 'assets' into lending. The Forest Carbon Partnership Facility of the World Bank is supporting forest-rich countries of the global south to enter the global offsetting trade in carbon.<sup>57</sup> The European Investment Bank is working with the University of Stirling's Management School to

'design markets for ecosystem service delivery' (or 'eco-delivery' as they call it).<sup>58</sup> Multilateral development banks, themselves increasingly making private sector investments that go towards financial intermediaries and private equity funds,<sup>59</sup> are being encouraged to 'partner countries to sustain their natural capital', through integrating mapped and monetised 'ecosystem services' in all bank 'strategic direction-setting, investment, and advisory services'.<sup>60</sup> An interpretation of these moves, consistent with the thesis that financialisation currently is driving accumulation, is that large bank lenders are financialising their own investment practices (through lending to private sector finance), at the same time as encouraging the increasing financialisation of environmental management and conservation.

This moves us into the next layer I want to draw attention to, which is the creation of nature as a 'service-provider' and the production of billable 'nature work'

### Nature Work



Source: <http://www.naturalcapitalproject.org/home04.html>

A significant conceptual move enabling the financialisation of conserved non-human nature, is the construction of nature as a ‘service-provider’. Conservation biologists have been using the language of ecosystem services since the 1970s.<sup>61</sup> The 2005 publication of the influential United Nations Millennium Ecosystem Assessment (MEA), which highlights human-generated change of the biosphere, overwhelmingly uses this language in speaking of the non-human world.<sup>62</sup> More recently, the Deputy Head of the Species Programme of the IUCN has stated that ‘[i]t’s time to recognize that nature is the largest company on Earth working for the benefit of 100 percent of humankind – and it’s doing it for free’.<sup>63</sup>

In combination, this language creates non-human nature as a company that needs to be acknowledged for the service work that it does. Of course, any ensuing payments do not actually go to nature, but to the people who are able to capture them. What becomes significant then are questions of what nature work is able to become billable, and of who, via enforceable property rights signalling ownership, becomes able to capture the revenue arising from payments for this billable work.

The growing discourse on payments for ecosystem services (PES) both creates, and attempts to resolve, precisely these questions. The key idea here is that those wanting and/or requiring the ‘service’ of environmental health should pay those dwelling in the landscapes in which these ‘services’ are located. These flows and ‘cascades’ of services and payments<sup>64</sup> can be seen most clearly in the case of downstream water users paying upstream users to maintain water flow and/or quality.<sup>65</sup>

Given both the location of valued ecosystems in the ‘global south’, accompanied by need for their services in the industrialised ‘global north’, payments from north to south for service maintenance by the south for the north increasingly are being posited as a means of producing win-win sustainability (i.e. conservation and economic development) scenarios.<sup>66</sup> The result has been an urgent requirement to measure, assess, standardise and disaggregate nature into new ‘goods and service categories’, combined with measures of their health and/or degradation and the assigning of monetary prices to these measures.<sup>67</sup>

This is being done via rapid ecological assessment and economic valuation techniques. The latter rely heavily on contingent valuation or estimates of ‘willingness to pay’, the validity of which has received intense criticism within economics.<sup>68</sup> Ecosystem service valuation projected from unit values (dollar estimates of economic value on a per-unit basis) derived from particular use and non-use values measured at specific sites, also is often arrived at via the practice of ‘benefit transfer’. This parallels the conceptual convenience, as noted above, of the substitutability or *correspondence* between different locations, by permitting the transfer of ‘economic value estimates from one location to a similar site in another location’, an assumption and practice that again can produce a number of transfer errors.<sup>69</sup>

Through investment combined with regulatory and legislative support, these valuation techniques are permitting creation of an array of new markets in the environmental service products represented by the measurements they generate. They are ushering in an enormous systematic and competitive effort to measure, catalogue, *dissect* and ‘value’, i.e. price, nature’s ‘goods and services’, via an emerging ‘ecoinformatics’ that entrains mapping, measuring and monetisation techniques to produce combined ecosystems services catalogues, applicable from local to global scales. The table below provides examples of four such current and

massive ecosystem services valuation initiatives.

**Details of four current major global ‘eco-informatics’ initiatives to map and price ecosystem services.**

<b>Initiative title</b>	<b>Organisations</b>	<b>Details</b>	<b>Sources</b>
Natural Capital Project	The Nature Conservancy (TNC), The World Wide Fund for Nature (WWF), Stanford University	10-year project to develop tools for the modelling and mapping of the economic value of ecosystem services and to construct a global ‘natural capital database’	<sup>70</sup>
ARIES: Artificial Intelligence for Ecosystem Services	Conservation International (CI) and partners	Project launched in 2009 to create ‘a web-based technology... offered to users worldwide to assist rapid ecosystem service assessment and valuation at multiple scales, from regional to global’. The output of ‘an ARIES user session’ is ‘an <i>environmental asset portfolio</i> that describes in depth the spatial distribution of ecosystems and ecosystem services in the area, their potential and realized economic values’.	<sup>71</sup>
ESPA: Ecosystems	UK’s Department	£40.5 million funding for interdisciplinary research on delivering	<sup>72</sup>

Services for Poverty Alleviation	for International Development (DfID), Economic and Social Research Council (ESRC) and Natural Environment Research Council (NERC)	Ecosystems Services for Poverty Alleviation. The call for applications describes the need to ‘generate the evidence on ecosystem services [and] their full value’, and the normative framework is the intent to foster economic growth as ‘green growth’.	
TEEB: The Economics of Ecosystems and Biodiversity	European Union (EU) and United Nations Environment Programme (UNEP)	Massive research programme identifying ‘lack of market prices for ecosystem services and biodiversity’ as the key driver for both biodiversity loss and negative impacts on human well-being; and the assigning of market prices to nature is considered key for both ecological and social health.	73

All this effort constitutes a systematic ushering in of a new large-scale economic-environmental science so as to bring into focus a world of measured and ‘valued’ ecosystem services or ‘nature work’. The collaborative (and competitive) investment in complex ‘ecoinformatics’ approaches is connecting and entraining ecological and economics data so as to create ‘value’ at various ecosystem scales. It parallels capital investment in bioinformatics at the scale of molecular biology, or ‘accumulation by molecularisation’ as Nally puts it.<sup>74</sup> In combination these moves into both large and

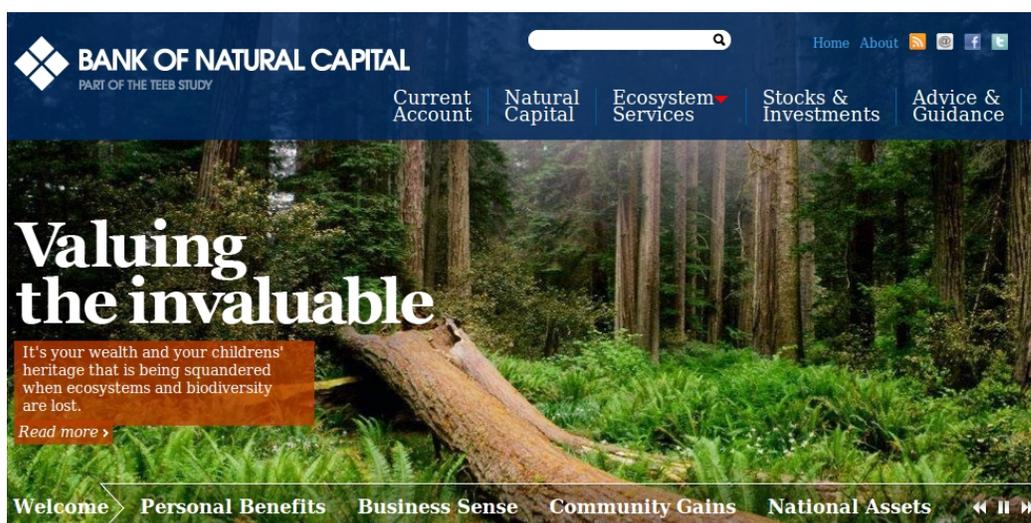
small scales of nature are working to permit consolidation of claims to domains (and inventions) of life, and as such to ‘expand the scale and scope of capital accumulation via so-called “extra-economic” means’.<sup>75</sup>

PES thus capitalises landscapes such that they can be brought into global markets in various new ways. The creation of billable nature work also is radically reframing inhabitants of service-producing landscapes as service-maintainers for consumers elsewhere in the global ledger of environmental services. The implications for those dwelling in landscapes newly priced for their ecosystem service functions are profound. This can be seen in proposals that local people might mortgage the environmental values newly associated with local landscapes so as to provide income for local development. The suggestion here is that communities in low income nations finance poverty alleviation and economic development through offering newly monetised ‘environmental assets’ as collateral for ‘environmental mortgages’. These would be loans offered by international environmental investors that are linked to measures of the state of an ‘environmental asset’.<sup>76</sup> They would contribute ‘debt-based investment’, i.e. that ‘capitalizes environmental assets locally and makes that capital available to local communities through collateralized lending, microfinance approaches, and access to affordable financial services’, thereby ‘providing access to affordable financial services in exchange for environmental stewardship’.<sup>77</sup> In these proposals, then, sustained ecosystem services as newly priced nature values are to be used as collateral for loans so that people of the ‘south’ – or the ‘fortune at the bottom of the pyramid’ as the business community likes to frame them<sup>78</sup> – can be brought further into the global monetary economy. Complex questions arise of who then possesses or has governing powers over the collateral (particularly in the case of default), and of how the pricing of local ecologies intersects with other socially embedded culture:nature values.

### Nature Banking

Accompanying creation of nature as billable service-provider, is an increasingly

hegemonic conceptualisation of the health and degradation of nature's services as dependent on the underlying stock of nature as 'natural capital'. Nature itself is becoming conceived as a bank account, as noted in the statement opening this paper, that 'Earth Incorporated' will only be sustainable if run as 'a depreciation, amortization and maintenance account'.<sup>79</sup> This has been taken seriously by the UN/EU project on The Economics of Ecosystems and Biodiversity (TEEB), headed by Pavan Sukdhev - a career banker from Deutsche Bank. The latest TEEB initiative is establishment of a website called The Bank of Natural Capital. This represents environmental issues in a rather standard current bank account format with pages for 'Current Account', 'Natural Capital', 'Ecosystem Services', 'Stocks and Investment', and 'Advice and Guidance'.



Source: <http://bankofnaturalcapital.com/> Accessed 5 March 2011.

Unsurprisingly then, 'nature banks', managed by nature bankers, are emerging as key management structures in environmental governance for conservation.<sup>80</sup> By creating the nature that capital can see,<sup>81</sup> in part through capitalising the service work that it is deemed to do, and in tandem with formalised property rights, landowners (private or collective) can thereby become nature entrepreneurs: they can capitalise on the new nature prices attaching to the 'nature assets' associated

with the monetised and thus billable service work accruing to defined land areas. Forms of 'nature banking' now are prominent in the US and Australia, and this approach is gaining traction elsewhere. An array of 'wetland mitigation banks', for example, exists in the US. These enable landowners to realise 'value' through maintaining wetland ecosystems by entering into financial exchanges with developers intending to degrade wetlands elsewhere, and accompanied by permitting and regulating legislation.<sup>82</sup> 'Species banking' has proliferated in recent years, particularly in the US (e.g. see [www.speciesbanking.com](http://www.speciesbanking.com)),<sup>83</sup> allowing trade in species credits to mitigate development impacts on protected species. Biodiversity banking (or 'biobanking') now is advocated such that '[a]ccrued investment [by landowners in biodiversity] could be sold to a party wishing to liquidate an equivalent amount and quality of vegetation elsewhere in the landscape'.<sup>84</sup> And the UK now is entering the environmental mitigation banking arena, with recent announcement of its first conservation credit scheme to be facilitated by The Environment Bank Ltd. ([www.environmentbank.com](http://www.environmentbank.com)),<sup>85</sup> within a conservative policy discourse that considers a future biobanking industry to be worth billions.<sup>86</sup> The nature banking and offset market approach has been advocated particularly strongly by the Katoomba Group, 'an international network of individuals working to promote, and improve capacity related to, markets and payments for ecosystem services (PES)',<sup>87</sup> and whose online 'Ecosystem Marketplace' ([www.ecosystemmarketplace.com](http://www.ecosystemmarketplace.com)) provides market information to facilitate transactions.

Private investment is promoted as the source of funds to facilitate the creation and structuring of nature banks and the ensuing mitigation banking market. The Ecosystem Marketplace's former Director and co-founder in fact is now a partner and co-founder of EKO Asset Management Partners, the merchant bank mentioned above established precisely to invest in – i.e. to capitalise – new markets in new environmental products.<sup>88</sup> The consequent attaching of prices to nature's 'services' permits the banking of these new nature values by those who own land and whose ownership is protected by property law. The mission of the US Office of Ecosystem

Services and Markets thus is to ‘focus on scientifically rigorous and economically sound methods for quantifying carbon, air and water quality, wetlands, and endangered species benefits in an effort to facilitate the participation of farmers, ranchers, and forest *landowners* in emerging ecosystem markets’.<sup>89</sup> In combination, then, the process serves to add and bank more monetary value to that which already is able to enter a market exchange; i.e. to that which already is formally owned (discussed further below).

### Nature Derivatives

I have noted above the proliferation of increasingly derived carbon products as a constitutive aspect of the expanding frontier of conservation commodity markets. The creation of similarly derived environmental-financial products, or ‘nature derivatives’, in additional environmental domains is a burgeoning feature of financialisation of environmental conservation for lucrative management of environmental risk and scarcity.

A recent paper in *Frontiers in Ecology and the Environment*, for example, proposes the creation of ‘biodiversity derivatives’.<sup>90</sup> A derivative contract ‘is a bet as to whether the value of the underlying security, which might be a stock, bond, or financial index, will increase or decrease by a specified date’.<sup>91</sup> These contracts permit businesses to ‘hedge against the occurrence of unpredictable adverse events’.<sup>92</sup> As such, they are associated with the construction of risk as a tradable commodity,<sup>93</sup> at the same time as also permitting speculative returns based on the chances of the derivatives contract itself.<sup>94</sup> In recent years, derivative creation has extended into the turbulent realms associated with unpredictable atmospheric, oceanic and biospheric dynamics, permitting the direct hedging and trading of environmental contingencies in capital markets, as superbly described and theorised by Melinda Cooper.<sup>95</sup> For biodiversity derivatives, the suggestion is that the market be used to reduce the costs of conservation, by applying derivatives to the risk of species extinction. The proposal is that ‘governments issue modified derivatives contracts to sell species’

extinction risk to market investors and stakeholders', as a means of providing *incentive structures* that take 'full advantage of the market to reduce costs in conservation'.<sup>96</sup> This, it is argued, will *align* the interests of conservationists, governments and landowners, by making species presence more valuable to landowners than modifying habitat through development. Contracts would be priced on current interest rates and the probability of a payout or default due to species decline below an agreed threshold. If triggered through species decline, the principal paid by investors would be made available for remediation and recovery of the species in advance of being placed on an endangered species list.<sup>97</sup> Biodiversity derivatives based on risk of species extinction would be akin to insurance derivatives, 'issued with modifications to allow responsible action to decrease the likelihood of the insured event' (i.e. extinction of a species) so as to encourage 'social change that is incentivized through market forces'.<sup>98</sup>

This transferring of derivatives logic to the domain of species survival seems strange. Futures exchanges might help stabilise prices for storable commodities by balancing sellers' hopes for rising prices with buyers' desire for the opposite. But it seems perverse to transform the value of species survival into prices whose rise or fall is entangled with bets on the likelihood of their being susceptible to their irreversible loss, underscored by a situation whereby species value rises with rarity, i.e. with greater risk of extinction. Susan Strange notes that gambling on prices creates 'heightened volatility'. Is this what is wanted for species presence?<sup>99</sup> Mandel *et al.* argue, however, that through issuing a derivative whose value is based on *species decline*, and '[i]f the trading of species derivatives were responsibly permitted', then 'those who do not currently incorporate a conservation ethic into their economic decisions would stand to profit from a change in behaviour towards environmental stewardship'.<sup>100</sup> This, of course, is a classic neoliberal suggestion to design, invest in, and legislate for market-based incentives to manipulate behaviours through appealing to the economic self-interest of those with protected land tenure.

Proposals such as this act to enhance the ways in which environmental change, itself indelibly and inequitably entwined with human activity, can become ‘a speculative opportunity like any other in a market hungry for critical events’.<sup>101</sup> They are rationalising nature dynamics to fit the dynamics of human constructed financial markets, permitting the assigning of tradable prices to the unstorable commodities of essentially unknowable futures.<sup>102</sup> So whilst the production of nature work and nature banking, as described above, is rendering nature into a new ‘mass of standardized, qualitatively indifferent exchange values’,<sup>103</sup> financialisation here is extending possibilities for nature’s speculative release into the realm of circulating money in its new universal form of derivatives. This derivative realm ‘challenge[s] the idea that the circulation of money must be anchored in some fundamental, underlying value’,<sup>104</sup> whilst at the same time binding nature’s dynamics, and associated wealth-making possibilities, to the influence of financial investment in other commodities. The innovative conceptual alignment of nature change with derivative finance products acts to materially enhance the fortunes of investors and their associated impacts, whilst shifting the locus of decision-making power regarding environmental governance to the realm of finance and the speculative expectations governing futures markets. It is capturing a nature of unpredictable flows and dynamism such that these are able to circulate as money – as a nature ‘on the move’ as Bram Büscher calls it<sup>105</sup> – the power and material effects of which are concealed through the abstract and seemingly virtual *milieu* of its movement.

### **The environmentality of ‘earth incorporated’? Theoretical gestures**

The above documents the transformation of conserved nature into discrete ‘billable hours’ and bankable assets, whose release onto markets in varied forms and at different scales is constituting an expanding investment frontier. The novel and frequently opaque ecology of associated and intersecting terms and concepts on which this frontier feeds, constitute an emergent and systemic wave of semiotic<sup>106</sup>

and material enclosure of 'the global environment'. It is creating a new 'product range' of complex, virtual and mobile nature products, to produce a 'derivative nature'<sup>107</sup>, which while increasingly abstract nonetheless has significant material effects. In what remains I theorise these phenomena through two key and complementary theoretical lenses: that of Marxian primitive accumulation, and of the consolidation of Foucaultian bio-political governmentality in the realm of socio-environmental management.

### On contemporary primitive accumulation

Primitive accumulation is the drive of capital and its protagonists to both *create* and capture the forms of capitalist value that underscore all subsequent relations of production and exchange. For Marx, the two critical enclosures are of land as property, and human activity as labour, the creation of which required the historical separation of each from the other, or the *disembedding* of people from land-entwined social relations, as Polanyi puts it.<sup>108</sup> Other scholars have highlighted additional historical primitive accumulations as integral to capitalist strategy, together with the ideational changes required and effected in bending nature *in situ*, as well as human life and bodies, into the commodity form.<sup>109</sup>

The accumulations of productive forces that are not *a priori* manufactured for sale, all require, and are mirrored by, significant and frequently radical, i.e. onto-epistemologically unintuitive, conceptual transformations. New commodity fictions need to be imagined for them to manifest; and the commodity fantasies that become discursively and materially prominent are those privileged by empowered socio-political structures, which in modernity are associated with imperial and patriarchal adventure. In relation to non-human natures, the radical application of a notion of absolute private property to land areas, and a rejection of prior values, access or use rights by those dwelling there, underscores all subsequent commodity creation. Land itself becomes capital that can be owned absolutely: the monetary value of which can rise and fall in relation to other commodities, and the exchange of which

can occur at a distance with money as symbolic medium and measure of value. In combination, land and human activity are transformed from subject to object, thereby permitting their reification as tradable commodities.<sup>110</sup> Viewed through the onto-epistemological lens of non-capitalist cultures, whether historic or contemporary, such conceptualisations can be a nonsense. Instead it might make more common sense to think that land ‘owns’ people,<sup>111</sup> or at least is animated by myriad other practices of relationship, value and ethical requirements.<sup>112</sup>

Marx states additionally that ‘[a]s soon as capitalist production is on its own legs, it not only maintains this separation [of labour from the means of capitalist production], *but reproduces it on a continually extending scale*’.<sup>113</sup> Massimo de Angelis refers to this as the *ontological*, as opposed to historical, condition of capitalist production, to describe the continuous creation, capture and enforced possession of new commodities that permit capital’s recursive accumulation.<sup>114</sup> Many other authors have stressed this *continuous* nature of so-called ‘primitive accumulation’, from Rosa Luxemburg writing in 1913, to David Harvey writing in 2010.<sup>115</sup> Recent analyses of primitive accumulation that see its historical shape as present in contemporary circumstances globally, thus frame the process as ‘continuous’,<sup>116</sup> ‘permanent’,<sup>117</sup> and ‘contemporary’.<sup>118</sup> As Silvia Federici, maintains, ‘primitive accumulation has been a universal process in every phase of capitalist development’, re-launching ‘similar strategies in the face of every major capitalist crisis’.<sup>119</sup>

Historically and today, rises in capital ‘values’ for land increase the possibility for enhanced money rents, and strengthen desires by land-owners to expropriate land-dwellers, thus ‘releasing’ their availability as labour.<sup>120</sup> The current proliferation of new nature values and tradable commodities for environmental conservation, as outlined above, can be understood as a similar and significant wave of primitive accumulation in these terms. They are structuring nature into the reified and exchangeable commodity form in previously unthought ways,<sup>121</sup> at the same time as creating additional ways of bringing diverse peoples into the global market in service

to these new commodity forms. As such, they are consistent with maintaining a political economic (and cultural) system in which ‘only production-for-market... [is] defined as a value-creating activity’,<sup>122</sup> a movement which seems likely to discount and displace other value practices and diversities.<sup>123</sup>

### The environmentality of ‘Earth Incorporated’

Whilst not discounting the hybrid ‘uses’ and manifestations of neoliberal policies in environmental domains,<sup>124</sup> the myriad policies and practices described above arguably become clearer given their consistency with the globally hegemonic governmentality, or even ‘culture complex’,<sup>125</sup> of neoliberalism. Here I draw inspiration from Foucault in two ways: to highlight the practices delineating and thereby composing the natures that can be managed and traded as ‘Earth Incorporated’; and to emphasise the ‘bootstrapping’ biopolitical *gestalt* of the empowered ‘truth regime’ of the market, in both shaping and being reinforced by these natures.

Foucault emphasised that new regimes of governance are structured and bolstered by new social sciences, which iteratively also enable new techniques of management and administration that concord with the *episteme* of modernity. At the time of the rise of the bourgeois class and the Age of Reason in Europe, for example, he makes much of the accompanying presence of a novel bourgeois spirit that partitions, makes distinctions, classifies, codifies and calculates.<sup>126</sup> He is talking here about the body; and about the new social sciences that helped to construct, subject, manage and *accumulate* the body as a utility-maximising ‘body-machine’, as well as to rationalise and administrate bodies as *populations*.

In the contemporary arena of primitive accumulation in association with neoliberal environmental governance, my suggestion is that we are bearing witness to an intense extension of these tendencies into *socio-ecological* domains. Through ecosystem service science, nature, like the body, is being made conceptually docile.

It is becoming 'caught in a [new] system of subjection', whereby its productive characteristics are further 'calculated, organized, technically thought' and 'invested with power relations'.<sup>127</sup> As with the new sciences of demography, nutrition etc. that make possible the administrations of the modern era and which involved the *application of accounting to social relations*, currently we are witnessing the similar and apparently depoliticised *application of accounting to socio-environmental relations*. Like the human body, and the body-politic of populations, nature as service-provider and store of capital is 'entering a machinery of power that explores it, breaks it down and rearranges it', thus bending and releasing its immanent forces towards economic utility.<sup>128</sup> In these new ecological accounting practices for environmental conservation, the very necessity of conceptualising ecosystems in terms that lend themselves to the disaggregation of measures amenable to monetisation contracts ecological understanding and may hamper conservation outcomes.<sup>129</sup> In further transforming and accumulating 'Nature's' exceeding immanence into 'work powers', the animated, embodied and sentient world that may be experienced by non-capitalist rationalities is of necessity erased.<sup>130</sup> Nature's operations are made 'intelligible and controllable', 'void of any intrinsic teleology'<sup>131</sup> or agency.<sup>132</sup> As such, human nature is rendered deaf but in apparent authority over a mirroring mute and intractably distinct non-human nature.

Alvehus and Spicer<sup>133</sup> note that an increasing experience of work as financialised 'billable hours' is a classic strategy of workplace control. Similarly, the 'micro-physics of power' operating in the multiplicitous moments and institutional apparatuses of ecosystem service science is strategically *training* socio-environment relations into those of Earth Incorporated,<sup>134</sup> creating nature as both usefully productive and utterly subdued in the process. Disaggregation of environmental turbulence into financial products that capture environmental unpredictability into the circulating and derivative commodity form, similarly flattens nature's life and dynamism through 'writing' these as finance.<sup>135</sup>

Foucault's more recently published work, particularly his lectures of 1978-79 on biopolitics, published in English in 2008, is critically illuminating in this respect.<sup>136</sup> In this, he draws to the fore the socio-political fact of the 'truth regime' of the market under liberalism; and the corresponding necessity of working to create the governing incentivising and regulatory structures that allow for the 'free market's' need for 'frugal government'. As Martin O'Connor has also noted, '[t]he logic of the marketplace states plainly that all capitals will realize their "full value" only by insertion within the sphere of exchange value. Under the doctrine of utility maximisation, their best use will be signaled by price: they should always go to the highest bidder'.<sup>137</sup> Muradian, Corbera, Pascual, Kosoy and May describe how this naturalisation of capitalist 'free markets' also is rationalised by a Coasean institutional economics that assumes the emergence of social and environmental optima through the incentivised bargaining of those with private property allocations.<sup>138</sup>

These conspire to produce a 'governmentality' that ironically requires intense government and public engagement to facilitate the construction and regulation of the incentive structures that discipline individual and corporate behaviour, to conform with the logic of the 'free market'. This, as Noel Castree notes, is 'the paradoxical need for "free" markets to be managed'.<sup>139</sup> In understanding neoliberalism to take hold as governmentality, i.e. to be both reinforced and hybridised through multiplicitous yet patterned acts and practices of governance, participation and resistance, it becomes possible to notice how similar practices are unfolding as the 'truths' of contemporary environmental governance. Robert Fletcher, in a recent article in *Conservation and Society*, thus extends the notion of governmentality to highlight the governing incentive structures associated with *environmental* governance for environmental conservation under neoliberal logics, as well as the different *environmentalities* associated with other governing logics.<sup>140</sup> In embracing the truth regime of the market, the art of government in relation to 'environmental conservation' of necessity will be the environmentality of Earth

Incorporated: the accepted participation of all environmental concerns in the logic of the market, such that they become framed, traded, banked and circulated as capital.

### **The nature of the beast?**

Current rationalisations and monetisations of nature in terms of the disaggregated, commodified and banked services that 'it' provides, constitute a new mechanisation of nature management to satisfy discourses of efficiency in the realm of environmental conservation;<sup>141</sup> whilst maintaining accumulation as 'the engine which powers growth under the capitalist [conservationist] mode of production'.<sup>142</sup> The enhanced separation of human from non-human worlds that this permits makes possible further transformations of nature from subject into object, constituting a significant new layer in the reification of nature as an object consisting of many objects. Nature's agency is foundationally discounted,<sup>143</sup> and human:non-human relationships become further disciplined into master-slave or doctor-patient configurations.<sup>144</sup> Nature is reconstituted as 'service-provider' for humanity, and people dwelling in landscapes now valued for their ecosystem services are transformed into the labour needed to maintain these services (or are displaced). To paraphrase Sassen, vast regions of the world are being repositioned and territorialised as sites for capitalised global ecosystem services conservation and supply.<sup>145</sup>

All these market-based innovations are being effected to accord with the desirable objective of promoting nature's conservation. But surely there is a fallacy at the heart of these conceptual and technical strategies to incentivise environmentally ethical behaviour via the design of commodity markets and associated financialised trading activity? This is that 'the market' does not in and of itself embody or produce virtuous behaviour. The market does not care. And given a political economic system based on the 'permanently revolutionary force' of capital accumulation,<sup>146</sup> it seems

problematic to assume that it is only the correct design of markets, e.g. through pricing mechanisms, that will prevent the manifestation of nature losses. What is being promoted here is a valuing of nature *as money*, not of nature's immanence or sentience, or as a communicative community of which we as humans are one of many companions. And since the 'free-market' is an emergent property of the competitive dance of multiple commodity prices, exchanges and other asymmetries and influencing factors, there is nothing intrinsic to this system to uphold the prices of environmental health relative to unpredictably shifting prices of other commodities.

It is pertinent to remember Polanyi's description of the transformation of land into the commodity form as 'perhaps the wierdest of all the undertakings of our ancestors'.<sup>147</sup> Currently we are in the midst of an equivalently revolutionary shift in empowered ideas regarding a global geography of non-human natures and associated cultural diversities. While these build on extant understandings of land as commodity and of private property, they extend these in radical ways to release new nature 'values' that can be traded, invested in and speculated on via conversion into the commodity form. To paraphrase Marx,<sup>148</sup> once again, a 'new social soul' is popping into the body of nature; as the non-human world becomes enclosed, conceptually, economically and legally, into new nature products, and as human and non-natures become reoriented around the emerging environmentality of Earth Incorporated. It seems to me that perhaps the composing of humane, healthy, equitable and diverse socio-ecological relationships instead requires moving in an entirely different direction: towards conceptualising and embodying socio-environmental realities that connect human and non-human ecologies without the always mediating and structuring sign of money. Opening up such possibilities is a task that anthropologist are particularly well-placed to embrace.

- <sup>1</sup> This work has been through several iterations and has benefited along the way from a number of commentators, to whom I express my gratitude. Any remaining errors of interpretation are mine alone. Some of the thoughts presented here have been published online in Sullivan, S. 'The environmentality of "Earth Incorporated": on contemporary primitive accumulation and the financialisation of environmental conservation', [http://www.worldecologyresearch.org/papers2010/Sullivan\\_financialisation\\_conservation.pdf](http://www.worldecologyresearch.org/papers2010/Sullivan_financialisation_conservation.pdf); they also form the basis for a longer paper which currently is under revision with *Antipode* entitled 'Banking nature: the spectacular financialisation of environmental conservation, with Marx and Foucault'. A longer engagement with these issues will be presented in my book *Creating Earth Incorporated? Nature//Finance//Values*, which is under consideration with MayFly Books.
- <sup>2</sup> Sian Sullivan is an anthropologist interested in shamanism, cultural landscapes, human non-human relationships, and the politics of biodiversity conservation. She received her PhD from UCL in 1998 and currently teaches courses in Cultural Landscapes and Environment and Development at Birkbeck College (Dept. of Geography, Environment and Development Studies). She has conducted field research with Damara / ≠Nū Khoen people in north-west Namibia, and in social movement contexts associated with the global justice movement. Much of her published work can be found online at <http://siansullivan.wordpress.com>.
- <sup>3</sup> Strong, M. (1996) A new 'rich-poor' war, Lecture to the Korea Institute for International Economic Policy, Seoul, Korea, 22 October 1996, <http://www.mauricestrong.net/2009032079/speeches2/speeches2/korea-economic-policy.html> Accessed 30 November 2009.
- <sup>4</sup> <http://www.ekoamp.com/who/> Last accessed 8 March 2011.
- <sup>5</sup> Brockington, D. and Duffy, R. (2010) Capitalism and conservation: the production and reproduction of biodiversity conservation. *Antipode* 42(3): 469-484.
- <sup>6</sup> See, for example, Chapin, M. (2004) A challenge to conservationists. *World Watch Magazine* 17(6): 16-31; and MacDonald, C. (2008) *Green Incorporated: An Environmental Insider Reveals How a Good Cause Has Gone Bad*. Guilford, The Lyons Press.
- <sup>7</sup> As articulated in Hart, S.L. (1997) Beyond greening: strategies for a sustainable world. *Harvard Business Review* January-February: 66-76.
- <sup>8</sup> Brockington and Duffy *op cit.* p. 480.
- <sup>9</sup> Bellamy Foster, J. and McChesney, R. (2009) Monopoly-finance capital and the paradox of accumulation. *Monthly Review* October <http://www.monthlyreview.org/091001foster-mcchesney.php> Accessed 23 August 2010; also Epstein, G.A. (2006) *Financialization and the World Economy*. Cheltenham, Edward Elgar Publishing.
- <sup>10</sup> Cooper, M. (2010) Turbulent worlds: financial markets and environmental crisis. *Theory, Culture & Society* 27(2-3): 167-190.
- <sup>11</sup> For example, In February 2011 the Centre A. Koyré for History of Science & Technology ([www.koyre.cnrs.fr](http://www.koyre.cnrs.fr)) and the Ile de France Research Network on Sustainability Research ([www.r2ds-ile-de-france.com](http://www.r2ds-ile-de-france.com)) advertised a post-doc fellowship to study emerging financial markets in biodiversity offsetting, and the financialization of biodiversity; and Leeds University Business School currently is leading an EU Framework Program consortium on 'Financialisation, economy, society and sustainable development', intended to consider how finance can better serve economic, social and environmental domains.
- <sup>12</sup> Bellamy Foster and McChesney (2009) *op cit.*
- <sup>13</sup> O'Connor, J. (1988) Capitalism, nature, socialism: a theoretical introduction. *Capitalism, Nature, Socialism* 1: 11-38; also Prudham, S. (2009) Pimping climate change: Richard Branson, global warming, and the performance of green capitalism. *Environment and Planning A* 41: 1594-1613, and references therein.
- <sup>14</sup> Moore, J. (2010) The end of the road? Agricultural revolutions in the capitalist world-ecology, 1450-2010. *Journal of Agrarian Change* 10(3):389-413, p. 390; also see Nally, D. (2011) The biopolitics of food provisioning. *Transactions of the Institute of British Geographers* 36: 37-53.
- <sup>15</sup> In using the term 'compose' here, I am influenced by Bruno Latour's recent work and emphasis on the positive task of understanding (socio)nature as assemblages that are always being actively brought forth, e.g. *Politics of Nature: How to Bring the Sciences into Democracy*, Cambridge Massachusetts, Harvard University Press, (2004); and An attempt at a "compositionist manifesto",

- New Literary History* (in press). My understanding is that this extends a strong poststructuralist and phenomenological emphasis on agency and possibility in nature(s), whether material, social or political, as never simply already there but as constituted through engagement and experienced through embodied immanence (cf. Merleau-Ponty, M. (2002(1945)) *The Phenomenology of Perception*, London, Routledge; Bateson, G. (2000(1972)) *Steps to an Ecology of Mind*, Chicago, University of Chicago Press; Deleuze, G. and Guattari, F. (1987(1980)) *A Thousand Plateaus: Capitalism and Schizophrenia*, trans. Brian Massumi, London, The Athlone Press; Ingold, T. (2000) *The Perception of the Environment: Essays in Livelihood, Dwelling and Skill*, London, Routledge; discussed further in Sullivan, S. (2010) 'Ecosystem service commodities' – a new imperial ecology? Implications for animist immanent ecologies, with Deleuze and Guattari, *New Formations: A Journal of Culture/Theory/Politics* 69: 111-128.
- <sup>16</sup> Cf. David Graeber's brilliant work on the anthropology of value, Graeber, D. 2001 *Towards an Anthropological Theory of Value: The False Coin of our Own Dreams*. Basingstoke, Palgrave Macmillan.
- <sup>17</sup> UNESCO 2011 *UNESCO Interactive Atlas of the World's Languages in Danger*. <http://www.unesco.org/new/en/unesco/themes/languages-and-multilingualism/endangered-languages/> Last accessed % March 2011.
- <sup>18</sup> Tsing A.L. (2005) *Friction: An Ethnography of Global Connection*. Princeton, Princeton University Press, p. 57.
- <sup>19</sup> O'Connor, M. (1994) On the misadventures of capitalist nature, pp. 125-151 in M. O'Connor (ed.) *Is Capitalism Sustainable? Political Economy and the Politics of Ecology*. London, the Guilford Press. pp. 126, 133.
- <sup>20</sup> Robertson, M.M. (2006) The nature that capital can see: science, state, and market in the commodification of ecosystem services. *Environment and Planning D: Society and Space* 24: 367-387, p. 368.
- <sup>21</sup> Tsing *op cit.* p. 57.
- <sup>22</sup> Costanza, R., d'Arge, R., de Groot, S., Farber, M., Grasso, B., Hannon, K., Limburg, S., Naeem, R., O'Neill, J., Paruelo, R., Raskin, R., Sutton, P. and van den Belt, M. (1997) The value of the world's ecosystem services and natural capital. *Nature* 387: 253-260.
- <sup>23</sup> [http://www.advancedconservation.org/blog/?page\\_id=58](http://www.advancedconservation.org/blog/?page_id=58) Last accessed 5 March 2011.
- <sup>24</sup> UNEP/IUCN (2007) Developing international payments for ecosystem services: towards a greener world economy, [http://www.unep.ch/etb/areas/pdf/IPES\\_IUCNbrochure.pdf](http://www.unep.ch/etb/areas/pdf/IPES_IUCNbrochure.pdf) Accessed 23 September 2008
- <sup>25</sup> At [www.unep.org/greeneconomy](http://www.unep.org/greeneconomy) Accessed 23 April 2010. Thanks to Bram Büscher for drawing my attention to this image.
- <sup>26</sup> O'Connor, M. *op cit.* p. 140.
- <sup>27</sup> e.g. Bumpus, A.G. and Liverman, D.M. (2008) Accumulation by decarbonization and the governance of carbon offset. *Economic Geography* 84(2): 127-155.
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