

# Supplementary Materials: Paradise Islands? Island States and Environmental Performance

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**Table S1.** The list of environmental indicators used as dependent variables.

| #                           | Name of the Variable                           | Source of Data  | Original Source  | Reference Year        | Total Number of Observations | Number of Island States | Interpretation | Explanation  |
|-----------------------------|--|-----------------|--|-----------------------|------------------------------|-------------------------|----------------|--|
| <b>Water and Sanitation</b> |  |                 |  |                       |                              |                         |                |  |
| 1                           | Access to drinking water (proximity to target) | EPI 2012        | WHO/UNICEF   | 1990–2005, 2008       | 196                          | 35                      | direct         | percentage of a country's population that has access to an improved source of drinking water   |
| 2                           | Access to sanitation (proximity to target)     | EPI 2012        | WHO/UNICEF   | 1990–2005, 2008       | 192                          | 33                      | direct         | percentage of people with access to adequate sanitation facilities in relation to the total population   |
| 3                           | Change in water quantity (proximity to target) | EPI 2012        | P. Döll, K. Fiedler, and J. Zhang. Global-scale analysis of river flow alterations due to water withdrawals and reservoirs, Hydrol. Earth Syst. Sci., 13 | 2005                  | 202                          | 32                      | direct         | reduction of mean annual river flow from "natural" state resulting from water withdrawals and reservoirs   |
| 4                           | Water consumption (proximity to target)        | EPI2006         | University of New Hampshire, Water Systems Analysis Group  | mean annual 1950–1995 | 171                          | 16                      | direct         | percentage, human water demand   |
| 5                           | Water withdrawal score                         | Wellbeing index | FAO  | 2001                  | 165                          | 20                      | direct         | annual withdrawals of ground and surface water for domestic, agricultural, and industrial uses, in cubic kilometers per year   |
| 6                           | Nitrogen loading (proximity to target)         | EPI2006         | University of New Hampshire, Water Systems Analysis Group  | mean annual 1950–1995 | 172                          | 16                      | direct         | milligrams/liter; accounts for: atmospheric nitrogen deposition, nitrogen fixation, nitrogenous fertilizer loads, livestock nitrogen loading; and human nitrogen loading |

Table S1. *Cont.*

| #                        | Name of the Variable   | Source of Data | Original Source  | Reference Year | Total Number of Observations | Number of Island States | Interpretation | Explanation   |
|--------------------------|--|----------------|--|----------------|------------------------------|-------------------------|----------------|---|
| <b>Air and emissions</b> |  |                |  |                |                              |                         |                |   |
| 7                        | Sulfur dioxide emissions per capita (proximity to target)                  | EPI 2012       | Smith <i>et al.</i> (2011). Anthropogenic sulfur dioxide emissions: 1850–2005, Atmos. Chem. Phys., WDI, CIA World Factbook | 1850–2005      | 138                          | 13                      | direct         | Kilograms of sulfur dioxide/person  |
| 8                        | Sulfur dioxide emissions per GDP (proximity to target)                     | EPI 2012       | Smith <i>et al.</i> (2011). Anthropogenic sulfur dioxide emissions: 1850–2005, Atmos. Chem. Phys., WDI, CIESIN             | 1850–2005      | 138                          | 13                      | direct         | grams of sulfur dioxide per US dollar PPP (in 2005 constant US dollars)   |
| 9                        | Carbon dioxide per capita (proximity to target)                            | EPI 2012       | International Energy Agency  | 1960–2009      | 137                          | 13                      | direct         | kilograms of carbon dioxide per person  |
| 10                       | Carbon dioxide per GDP (proximity to target)                               | EPI2006        | Carbon Dioxide Information Analysis  | 2000           | 181                          | 34                      | direct         | tons of carbon dioxide/ US dollar GDP PPP, in 2000 US dollar  |
| 11                       | CO <sub>2</sub> emissions per electricity generation (proximity to target) | EPI 2012       | International Energy Agency  | 1960–2009      | 137                          | 13                      | direct         | grams of CO <sub>2</sub> per kWh  |
| 12                       | Urban Particulates (proximity to target)                                   | EPI2006        | Global Model of Ambient Particulates (GMAPS), World Bank   | 1999, 2000     | 180                          | 27                      | direct         | µg/m <sup>3</sup> ; only cities larger than 100,000 population and national capitals were considered, with a population weighted PM <sub>10</sub> concentration to account for exposure |
| 13                       | Anthropogenic NO <sub>x</sub> emissions per populated land area            | ESI 2005       | UNFCCC, Greenhouse gas (GHG) emissions database, <i>etc.</i>   | 1990–2003      | 158                          | 19                      | inverse        | metric tons NO <sub>x</sub> emissions per populated land area   |
| 14                       | Anthropogenic sulfur dioxide emissions per populated land area             | ESI 2005       | UNFCCC, Greenhouse gas (GHG) emissions database, <i>etc.</i>   | 1990–2003      | 153                          | 17                      | inverse        | metric tons sulfur dioxide per populated land area  |
| 15                       | Anthropogenic volatile organic compound emissions per populated land area  | ESI 2005       | UNFCCC, Greenhouse gas (GHG) emissions database, <i>etc.</i>   | 1990–2003      | 159                          | 20                      | inverse        | metric tons of non-methane volatile organic compounds per populated land area   |

Table S1. *Cont.*

| #                   | Name of the Variable   | Source of Data  | Original Source   | Reference Year | Total Number of Observations | Number of Island States | Interpretation | Explanation   |
|---------------------|--|-----------------|---|----------------|------------------------------|-------------------------|----------------|---|
| 16                  | Acidification exceedance from anthropogenic sulfur deposition                                      | ESI 2005        | Stockholm Environment Institute at York   | 1990           | 236                          | 40                      | inverse        | percentage of total land area at risk of acidification exceedance   |
| 17                  | Import of polluting goods and raw materials as a percentage of total imports of goods and services | ESI 2005        | COMTRADE  | 2002           | 114                          | 14                      | inverse        | import of polluting goods and raw materials as a percentage of total imports of goods and services  |
| 18                  | Use of ozone depleting substances per land area  | Wellbeing index | Ozone Secretariat, United Nations Environment Programme, 1999. Production and consumption of ozone depleting substances 1986–1998. Ozone Secretariat, UNEP, Nairobi | 1995           | 154                          | 27                      | inverse        | the use of ozone depleting substances per hectare of total (land and inland waters) area in grams of ozone depleting potential (g odp/ha) |
| 19                  | Use of ozone depleting substances per capita   | Wellbeing index | Ozone Secretariat, UNEP. 1999. Production and consumption of ozone depleting substances 1986–1998   | 1995           | 154                          | 27                      | inverse        | use of ozone depleting substances per person in grams of ozone depleting potential (g odp/capita)   |
| 20                  | Regional ozone (proximity to target)   | EPI2006         | MOZART-data, dev. at NCAR processed at Princeton University   | 1990–2004      | 218                          | 39                      | direct         | parts per billion, ozone concentration; 10 highest concentrations from 1990–2004 years  |
| <b>Biodiversity</b> |  |                 |   |                |                              |                         |                |   |
| 21                  | Threatened native bird species as a percentage of total native species                             | Wellbeing index | IUCN Species Survival Commission  | 1995           | 168                          | 32                      | inverse        | percentage  |
| 22                  | Threatened native species as a percentage of total native mammal species                           | Wellbeing index | IUCN Species Survival Commission  | 1995           | 176                          | 31                      | inverse        | percentage  |

Table S1. *Cont.*

| #  | Name of the Variable  | Source of Data  | Original Source  | Reference Year | Total Number of Observations | Number of Island States | Interpretation | Explanation   |
|----|---|-----------------|--|----------------|------------------------------|-------------------------|----------------|---|
| 23 | Threatened native reptiles as a percentage of total native reptile species              | Wellbeing index | IUCN Species Survival Commission                                 | 1995           | 139                          | 31                      | inverse        | percentage  |
| 24 | Threatened amphibian species as a percentage of known amphibian species in each country | ESI 2005        | IUCN-The World Conservation Union Red List of Threatened Species | 2004           | 191                          | 27                      | inverse        | percentage  |
| 25 | Threatened flowering plants species as a percentage of all wild species                 | Wellbeing index | IUCN Species Survival Commission                                 | 1995           | 142                          | 30                      | inverse        | percentage  |
| 26 | Threatened gymnosperms as a percentage of total native species of gymnosperms           | Wellbeing index | IUCN Species Survival Commission                                 | 1995           | 81                           | 18                      | inverse        | percentage  |
| 27 | Threatened native species of pteridophytes as a percentage of total native species      | Wellbeing index | IUCN Species Survival Commission                                 | 1995           | 69                           | 15                      | inverse        | percentage  |
| 28 | Endangered species  | EVI2004         | Needed Source?   | 2000           | 230                          | 39                      | inverse        | number of endangered and vulnerable species per 1000 square kilometers; focuses on those species that have become endangered or threatened in a country with implied impacts on biodiversity and ecosystem integrity                                      |
| 29 | Extinctions   | EVI2004         | IUCN Red Book 2000   | 1900–2000      | 229                          | 39                      |                | number of species known to have become extinct since 1900 per 1000 square kilometers  |
| 30 | National Biodiversity Index   | ESI 2008        | Convention on Biological Diversity, Global Biodiversity Outlook  | 2001           | 160                          | 14                      | direct         | score 0–1; assesses a country's species richness by measuring species abundance (includes some adjustment allowing for country size); countries with land area less than 5000 square kilometers are excluded as are overseas territories and dependencies |

Table S1. *Cont.*

| #                      | Name of the Variable                                       | Source of Data | Original Source  | Reference Year | Total Number of Observations | Number of Island States | Interpretation | Explanation  |
|------------------------|--|----------------|--|----------------|------------------------------|-------------------------|----------------|--|
| <b>Protected areas</b> |  |                |  |                |                              |                         |                |  |
| 31                     | Marine protection (proximity to target)                    | EPI 2012       | IUCN and UNEP-WCMC   | 1990–2010      | 185                          | 40                      | direct         | percentage of exclusive economic zone area protected   |
| 32                     | Terrestrial protected areas                                | WB             | UNEP-WCMC, WRI   | 2010           | 202                          | 34                      | direct         | percentage of total terrestrial area   |
| 33                     | Ecoregion protection                                       | NRMI           | CIESIN   | 2011           | 233                          | 40                      | direct         | percentage of biome area protected within country's land area; capped at 10% for each biome, consistent with international target, and weighted by share of biome's area in the country land area.   |
| 34                     | Percentage of country's territory in threatened ecoregions | ESI 2005       | Jonathan M. Hoekstra, Timothy M. Boucher, Taylor H. Ricketts, and Carter Roberts. (2005). Confronting a biome crisis: Global disparities of habitat loss and protection. <i>Ecology Letters</i> , 8, pp. 23-29 | 2004           | 230                          | 39                      | inverse        | threatend ecoregions are ecoregions with high ratios of habitat conversion to habit protection that are classified as vulnerable, endangered, or critical  |
| 35                     | Critical habitat protection (proximity to target)          | EPI 2012       | UNEP-World Conservation Monitoring Centre  | 2011           | 88                           | 22                      | direct         | percentage of the total Alliance for Zero Extinction site area that is within protected areas  |
| 36                     | Wilderness protection (proximity to target)                | EPI2006        | World Database on Protected Areas  | 2000           | 204                          | 31                      | direct         | percentage of wild areas that are protected; for each biome in a country, the following were calculated: the mean and standard deviation of Human Influence Index values, the sum of the footprint of human habitation (settlements, land use), infrastructural development (transportation and electric grid), and the population density |

Table S1. *Cont.*

| #   | Name of the Variable   | Source of Data  | Original Source                     | Reference Year            | Total Number of Observations | Number of Island States | Interpretation | Explanation  |
|---|--|-----------------|-------------------------------------|---------------------------|------------------------------|-------------------------|----------------|--|
| <b>Forest and vegetation</b>                |  |                 |                                     |                           |                              |                         |                |  |
| 37  | Growing stock change (proximity to target)                                   | EPI 2012        | FAO                                 | 1990, 2000, 2005 and 2010 | 155                          | 19                      | direct         | the standing tree volume of the forest resources, ratio of period 1 to period 0  |
| 38  | Forest loss (proximity to target)  | EPI 2012        | FAO                                 | 1990, 2000, 2005 and 2010 | 189                          | 31                      | direct         | the percentage loss of forest area owing to deforestation from either human or natural causes  |
| 39  | Forest cover change (proximity to target)                                    | EPI 2012        | FAO                                 | 1990, 2000, 2005 and 2010 | 215                          | 37                      | direct         | percentage change in the forest cover from period 0 to period 1  |
| 40  | Percentage of total forest area that is certified for sustainable management | ESI 2005        | The Forest Stewardship Council, WRI | 2000, 2004                | 230                          | 40                      | direct         | percentage of total forest area that is certified for sustainable management by The Forest Stewardship Council or Pan-European Forest Certification Council              |
| 41  | Natural vegetation cover remaining   | EVI2004         | WRI, FAO                            | 2000–2001                 | 155                          | 19                      | direct         | percentage of original (and regrowth) vegetation cover remaining   |
| 42  | Loss of natural vegetation cover   | EVI2004         | WRI, FAO                            | 2000–2001                 | 155                          | 12                      | direct         | net percentage change in natural vegetation cover over the last five years   |
| 43  | Timber harvest rate (proximity to target)                                    | EPI2006         | FAO                                 | 2000 and 2004             | 168                          | 19                      | direct         | timber harvest rate (percentage)   |
| <b>Fisheries and the marine environment</b> |  |                 |                                     |                           |                              |                         |                |  |
| 44  | Fishing stocks overexploited (proximity to target)                           | EPI 2012        | Sea Around Us Project               | 1950–2006                 | 181                          | 40                      | direct         | fraction of exclusive economic zone with overexploited and collapsed stocks  |
| 45  | Coastal shelf fishing pressure (proximity to target)                         | EPI 2012        | Sea Around Us Project               | 1950–2006                 | 185                          | 40                      | direct         | the catch from trawling and dredging gears divided by the exclusive economic zone area, tons per square kilometer  |
| 46  | Overfishing (proximity to target)  | EPI2006         | Environmental Vulnerability Index   | 1993–1998                 | 172                          | 38                      | direct         | average ratio of productivity to catch for five years 1993-1998  |
| 47  | Fish catching capacity per fish producing area score                         | Wellbeing index | FAO, <i>etc.</i>                    | 1995                      | 154                          | 32                      | direct         | the score (0–100) for weight of fish catching capacity per unit of fish producing area   |
| 48  | Fishing effort   | EVI 2004        | WRI                                 | 1994–1996                 | 97                           | 11                      | inverse        | average annual number of fishers per kilometer of coastline over the last 5 years, captures the risk of damage to fisheries' stocks through overcapacity of human effort |

Table S1. *Cont.*

| #  | Name of the Variable                                  | Source of Data  | Original Source   | Reference Year | Total Number of Observations | Number of Island States | Interpretation | Explanation   |
|----|---|-----------------|---|----------------|------------------------------|-------------------------|----------------|---|
| 49 | Percentage of fish species overexploited and depleted | Wellbeing index | FAO Marine Resources Service  | 1995           | 80                           | 14                      | inverse        | overexploited species + depleted species + depleted but recovering species as a percentage of assessed species  |
| 50 | Fisheries protection score                            | Wellbeing index | FAO Marine Resources Service  | 1995           | 80                           | 14                      | direct         | score (0–100) for overexploited species + depleted species + depleted but recovering as a percentage of assessed species, but the tops were set at five times those for the wild species indicators, since depleted and overexploited species are not necessarily threatened  |
| 51 | Fish catch in marine and inland waters                | Wellbeing index | FAO   | 1995           | 157                          | 32                      | inverse        | metric tons of catch  |
| 52 | Tons of fish catch per ton of fish catching capacity  | Wellbeing index | FAO   | 1995           | 157                          | 32                      | direct         | the score (0–100) for weight of catch per unit of fish catching capacity  |
| 53 | Ecosystem imbalance                                   | EVI2004         | University of British Columbia, Fisheries Centre, Lower Mall Research Station | NA             | 180                          | 39                      | inverse        | + or – change in trophic level calculated by weighting each trophic level present in the national catch by the tons reported.; captures the risk of ecosystem stress and loss of diversity/ balance; the greater the downward trend, the more likely that the marine biomass and trophic structures have been damaged |
| 54 | Food provision—Wild caught fisheries                  | OHI 2012        | Ocean Health Index  | 2012           | 157                          | 39                      | direct         | index, 0–100; reflects the amount of seafood captured in a sustainable way; the more seafood harvested or cultured sustainably, the higher the goal score   |
| 55 | Food provision—Mariculture                            | OHI 2012        | Ocean Health Index  | 2012           | 157                          | 39                      | direct         | index, 0–100; reflects the amount of seafood raised in a sustainable way; the more seafood harvested or cultured sustainably, the higher the goal score   |
| 56 | Natural products                                      | OHI 2012        | Ocean Health Index  | 2012           | 157                          | 39                      | direct         | index, 0–100; measures how sustainably people harvest non-food products from the sea  |

Table S1. *Cont.*

| #             | Name of the Variable                    | Source of Data | Original Source                   | Reference Year | Total Number of Observations | Number of Island States | Interpretation | Explanation  |
|---------------|---|----------------|-----------------------------------|----------------|------------------------------|-------------------------|----------------|--|
| 57            | Carbon storage                          | OHI 2012       | Ocean Health Index                | 2012           | 157                          | 39                      | direct         | index, 0–100; compares the current extent and condition of carbon dioxide storing coastal habitats (mangrove forests, seagrass meadows, and salt marshes) relative to their condition in the early 1980s.  |
| 58            | Coastal protection                      | OHI 2012       | Ocean Health Index                | 2012           | 157                          | 39                      | direct         | index, 0–100; measures the condition and extent of habitats that protect the coasts against storm waves and flooding; compares the current extent and condition of five key habitats that protect coastlines (mangrove forests, seagrass meadows, salt marshes, tropical coral reefs, and sea ice) from flooding and erosion relative to their condition in the early 1980s. |
| 59            | Sense of place—Iconic species           | OHI 2012       | Ocean Health Index                | 2012           | 157                          | 39                      | direct         | index, 0–100; measures the condition of iconic species to indicate some of ocean’s intangible benefits   |
| 60            | Sense of place—Lasting special places   | OHI 2012       | Ocean Health Index                | 2012           | 157                          | 39                      | direct         | index, 0–100; measures the percent of protected coastline to indicate some of ocean’s intangible benefits  |
| 61            | Clean waters                            | OHI 2012       | Ocean Health Index                | 2012           | 157                          | 39                      | direct         | index, 0–100; measures contamination of waters by trash, nutrients, pathogens, and chemicals   |
| 62            | Biodiversity – Habitats                 | OHI 2012       | Ocean Health Index                | 2012           | 157                          | 39                      | direct         | index, 0–100; reflects conservation status of marine species   |
| 63            | Biodiversity—Species                    | OHI 2012       | Ocean Health Index                | 2012           | 157                          | 39                      | direct         | index, 0–100; reflects the condition of key habitats that support high numbers of species  |
| <b>Energy</b> |   |                |                                   |                |                              |                         |                |  |
| 64            | Energy efficiency (proximity to target) | EPI2006        | Energy Information Administration | 1994–2003      | 182                          | 31                      | direct         | percentage of hydroelectric, biomass, geothermal, solar, and wind power production of total energy consumption   |

Table S1. *Cont.*

| #   | Name of the Variable  | Source of Data  | Original Source                         | Reference Year                                    | Total Number of Observations | Number of Island States | Interpretation | Explanation   |
|---|---|-----------------|---|---|------------------------------|-------------------------|----------------|---|
| 65  | Renewable energy (proximity to target)                                | EPI2006         | Energy Information Administration       | 1994–2003   | 210                          | 36                      | direct         | hydropower and renewable energy production as a percentage of total energy consumption; some countries exceed 100 percent because they are net exporters of renewable energy  |
| 66  | Energy materials score  | Wellbeing index | FAO                                     | 2001  | 180                          | 32                      | direct         | the lower score of two indicators: energy consumption per hectare of total area and energy consumption per person; it is limited to an energy index because of a lack of data on consumption of materials and waste generation. |
| <b>Waste</b>                                |   |                 |   |   |                              |                         |                |   |
| 67  | Generation of hazardous waste   | ESI 2005        | UNEP                                    | 1992–2001   | 91                           | 15                      | inverse        | metric tons of hazardous waste to be managed in the country   |
| <b>Agriculture, pesticides, fertilizers</b> |   |                 |   |   |                              |                         |                |   |
| 68  | Salinized area due to irrigation as a percentage of total arable land | ESI 2005        | FAO                                     | Arable land: 2000, Salinized area: MRYA 1990–1999 | 73                           | 10                      | inverse        | percentage of total salinized arable land from irrigation   |
| 69  | Fertilizer consumption per hectare of arable land                     | ESI 2005        | World Bank World Development Indicators | MRYA 2001–2003                                    | 176                          | 27                      | inverse        | 100 grams fertilizer consumption per hectare of arable land   |
| 70  | Pesticide consumption per hectare of arable land                      | ESI 2005        | FAO                                     | MRYA 1990–2003                                    | 127                          | 17                      | inverse        | kilograms of pesticide consumption per hectare of arable land   |
| 71  | Intensive farming   | EVI 2004        | FAO                                     | 1995–2000   | 176                          | 32                      |                | mean tons of intensively farmed animals produced per year per square kilometer of land  |
| <b>Land use</b>                             |   |                 |   |   |                              |                         |                |   |
| 72  | Percentage of modified land   | Wellbeing index | WCMC, etc.                              | mid–1990s   | 180                          | 32                      | inverse        | percentage  |
| 73  | Percentage of land cultivated   | Wellbeing index | FAO, UNECE & FAO                        | 2001  | 180                          | 32                      | inverse        | percentage  |
| 74  | Percentage of land that is built upon                                 | Wellbeing index | WCMC, etc.                              | mid–1990s   | 180                          | 32                      | inverse        | percentage  |

Table S1. *Cont.*

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|----|--|-----------------|------------------|----------------|------------------------------|-------------------------|----------------|--|
| 75 | Percentage of cultivated and modified land area with light soil degradation    | Wellbeing index | UNEP/ISRIC, etc. | 1990           | 167                          | 19                      | inverse        | a percentage of land with somewhat reduced agricultural suitability, where the light degree explains the level of soil degradation affecting an area given the weighted total percentage by the factors given; restoration to full productivity possible by modifying management; original biotic functions still largely intact |
| 76 | Percentage of cultivated and modified land area with moderate soil degradation | Wellbeing index | UNEP/ISRIC, etc. | 1990           | 167                          | 19                      | inverse        | percentage of land with greatly reduced agricultural suitability; major improvements required to restore productivity; original biotic functions are partly destroyed  |
| 77 | Percentage of cultivated and modified land Area with strong soil degradation   | Wellbeing index | UNEP/ISRIC, etc. | 1990           | 167                          | 19                      | inverse        | percentage of land that is non-reclaimable at farm level; major engineering works required for restoration; original biotic functions destroyed  |
| 78 | Percentage of cultivated and modified land area with Extreme soil degradation  | Wellbeing index | UNEP/ISRIC, etc. | 1990           | 167                          | 19                      | inverse        | percentage of land that is unreclaimable and beyond restoration; original biotic functions fully destroyed   |
| 79 | Degradation  | EVI2004         | FAO              | 2000           | 165                          | 12                      | inverse        | percentage of a country's land area considered severely and very severely degraded; reflects the status of loss of ecosystems in a country (land can no longer revert to its natural ecosystem without active and costly rehabilitation by humans to reverse permanent damage, if at all)  |
| 80 | Desertification sub-index  | EVI2004         | EVI              | 2004           | 234                          | 39                      |                | unweighted average of the scores for environmental risk occurrence (dry periods, hot winds, etc. )   |

Table S1. *Cont.*

| #                   | Name of the Variable   | Source of Data | Original Source  | Reference Year | Total Number of Observations | Number of Island States | Interpretation | Explanation  |
|---------------------|--|----------------|--|----------------|------------------------------|-------------------------|----------------|--|
| 81                  | Fragmented habitats  | EVI2004        | World Bank World Development Indicators 2001             | 1990–1999      | 169                          | 23                      | inverse        | total length of all roads in a country (km)/land area (sq km); cumulative area of all fragments of natural cover greater than 1000 hectares in the country as a percent of total land area; a proxy measure for pressure on ecosystems resulting from fragmentation into discontinuous pieces that also relates to habitat disturbance and degradation; fragmentation is likely to affect biodiversity |
| <b>Ecofootprint</b> |  |                |  |                |                              |                         |                |  |
| 82                  | Water footprint of consumption—total                         | WWF 2008       | Living planet report, WWF 2008                           | 1997–2001      | 138                          | 14                      | inverse        | gigameters cubed/year; total amount of water that is used to produce the goods and services consumed by the inhabitants of the nation  |
| 83                  | Water footprint of consumption—internal                      | WWF 2008       | Living planet report, WWF 2008                           | 1997–2001      | 138                          | 14                      | inverse        | water footprint from domestic supply   |
| 84                  | Water footprint of consumption—external                      | WWF 2008       | Living planet report, WWF 2008                           | 1997–2001      | 138                          | 14                      | inverse        | water footprint from imported water  |
| 85                  | Water footprint of production—Green water                    | WWF 2008       | Living planet report, WWF 2008                           | 1997–2001      | 138                          | 14                      | inverse        | volume of rainwater stored in the soil that evaporates from crop fields  |
| 86                  | Water footprint of production—Blue water                     | WWF 2008       | Living planet report, WWF 2008                           | 1997–2001      | 138                          | 14                      | inverse        | volume of freshwater withdrawn from water bodies that is used and not returned   |
| 87                  | Water footprint of production—Return flows                   | WWF 2008       | Living planet report, WWF 2008                           | 1997–2001      | 138                          | 14                      | inverse        | volume of water polluted as a result of the production process   |
| 88                  | Water footprint of production—stress on blue water resources | WWF 2008       | Living planet report, WWF 2008                           | 1997–2001      | 138                          | 14                      | inverse        | Ratio of total production water footprint minus the green component to total renewable water resources available in a country.   |
| 89                  | Ecological footprint per capita                              | ESI 2005       | Redefining Progress Ecological Footprint of Nations 2004 | MRYA 1999–2000 | 145                          | 10                      | inverse        | hectares of biologically productive land required per capita   |

Table S1. *Cont.*

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|-------------------------------------|---|----------------|---|----------------|------------------------------|-------------------------|----------------|--|
| <b>Other anthropogenic pressure</b> |   |                |   |                |                              |                         |                |  |
| 90                                  | Percentage of total land area (including inland waters) having very low anthropogenic impact  | ESI 2005       | The Human Influence Index, CIESIN         | 2004           | 222                          | 39                      | direct         | measures anthropogenic impact on land and inland waters based on human land uses, human access from roads, railways or major rivers, electrical infrastructure, and population density   |
| 91                                  | Percentage of total land area (including inland waters) having very high anthropogenic impact | ESI 2005       | The Human Influence Index, CIESIN         | 2004           | 222                          | 39                      | inverse        | Some repeat of above?  |
| 92                                  | Spills  | EVI2004        | ITOPF 2002, CRED 2000                     | 1996–2000      | 150                          | 36                      | inverse        | number of spills greater than 1000 liters between 1996–2000; captures the risk to marine, estuarine, riverine, lake, ground water, and terrestrial ecosystems from spills of hydrocarbons and other toxic fluids.  |
| 93                                  | Mining  | EVI2004        | USGS—US Geological Survey                 | 1996–2000      | 233                          | 39                      | inverse        | average total mining production from 1996–2000 in tons/square kilometers/year; captures the risk to terrestrial, aquatic ecosystems, and ground waters from the effects of ecosystem disturbance, accidents, oil spills and toxic leachates, and processing from mining of all kinds.  |
| <b>Environmental regulation</b>     |   |                |   |                |                              |                         |                |  |
| 94                                  | Number of environmental agreements total  | ENTRI          | ENTRI                                     | 2008           | 202                          | 39                      | direct         | Number of environmental agreements signed  |
| 95                                  | Participation in international environmental agreements                                       | ESI 2005       | 9 major environmental treaties considered | 2004           | 230                          | 40                      | direct         | Score between 0 and 1 with 0 corresponding to no participation and 1 equal to full participation; combines ratifications of treaties and conventions with the level of active participation in, contribution to, and compliance with the treaties' obligations; comprises nine major environmental treaties including Kyoto protocol, CITES, UNCCD |

Table S1. *Cont.*

| #   | Name of the Variable   | Source of Data | Original Source  | Reference Year                           | Total Number of Observations | Number of Island States | Interpretation | Explanation   |
|-----|--|----------------|--|--|------------------------------|-------------------------|----------------|---|
| 96  | Number of memberships in environmental intergovernmental organizations                   | ESI 2005       | Yearbook of International Organizations                              | 2003–2004                                | 230                          | 40                      | direct         | number of memberships in environmental intergovernmental organizations  |
| 97  | Pesticide regulation (proximity to target)   | EPI 2012       |  |  | 232                          | 40                      | direct         | legislative status of countries on the Stockholm Convention on POPs usage, and also the degree to which the country has followed through on the objectives of the conventions by limiting or outlawing the use of certain toxic chemicals |
| 98  | World Economic Forum Survey on environmental governance                                  | ESI 2005       | World Economic Forum (WEF) Survey, The Global Competitiveness Report | 2003–2004                                | 102                          | 12                      | direct         | survey questions addressing several aspects of environmental governance   |
| 99  | Local Agenda 21 initiatives per million people   | ESI 2005       | International Council for Local Environmental Initiatives, WDI       | 2001                                     | 112                          | 13                      | direct         | number of Local Agenda 21 initiatives per million people  |
| 100 | Percentage of variables missing from the CGSDI "Rio to Joburg Dashboard"                 | ESI 2005       | Consultative Group on Sustainable Development Indicators             | 2002                                     | 159                          | 17                      | inverse        | percentage; the greater the number of missing variables, the poorer the data availability in that country; environmental monitoring and data systems are vital for tracking progress towards environmental sustainability                 |
| 101 | IUCN member organizations per million population   | ESI 2005       | IUCN-The World Conservation Union                                    | IUCN memberships: 2004, Population: 2003 | 207                          | 37                      | direct         | number of member organizations per million people;  |
| 102 | Participation in the Responsible Care Program of the Chemical Manufacturer's Association | ESI 2005       | International Council of Chemical Associations                       | 2002                                     | 230                          | 40                      | direct         | score 1–4; participation in the Responsible Care Program of the Chemical Manufacturer's Association; responsible handling of chemicals is important for environmental sustainability  |

Table S1. *Cont.*

| #            | Name of the Variable  | Source of Data | Original Source  | Reference Year                      | Total Number of Observations | Number of Island States | Interpretation | Explanation  |
|--------------|---|----------------|--|-------------------------------------|------------------------------|-------------------------|----------------|--|
| 103          | Number of ISO 14001 certified companies per billion dollars GDP (PPP)                             | ESI 2005       | For ISO14001/EMAS registered companies: Reinhard Peglau, c/o Federal Environmental Agency, Germany, For GDP (PPP) data: World Bank World Development Indicators 2004   | ISO14001: 2003, GDP: MRYA 1998–2002 | 222                          | 38                      | direct         | number of ISO 14001 certified companies per billion dollars GDP (PPP)  |
| <b>Other</b> |   |                |  |                                     |                              |                         |                |  |
| 104          | World Economic Forum Survey on private sector environmental innovation                            | ESI 2005       | World Economic Forum   | 2003, 2004                          | 102                          | 12                      | direct         | survey questions on private sector environmental innovation, which contributes to developing solutions to environmental problems |
| 105          | Contribution to international and bilateral funding of environmental projects and development aid | ESI 2005       | Global Environmental Facility (GEF) contributions and receipts and Organisation for Economic Co-operation and Development (OECD) bilateral environmental aid; For ancillary economic data (GNI, PPP, USD current income): World Bank, World Development Indicators 2004; For population data: CIA World Factbook | 2004                                | 178                          | 35                      | direct         | score, 0–100   |

Note: Direct interpretation of the indicator implies that higher values stand for “better” performance on this indicator. Inverse interpretation means that higher values mean “worse” performance on this indicator.