



UNIVERSITY OF  
LIVERPOOL

# Does money really rule the (coral reef) world:

*Evidence for a Kuznets effect in a  
marine ecosystem?*

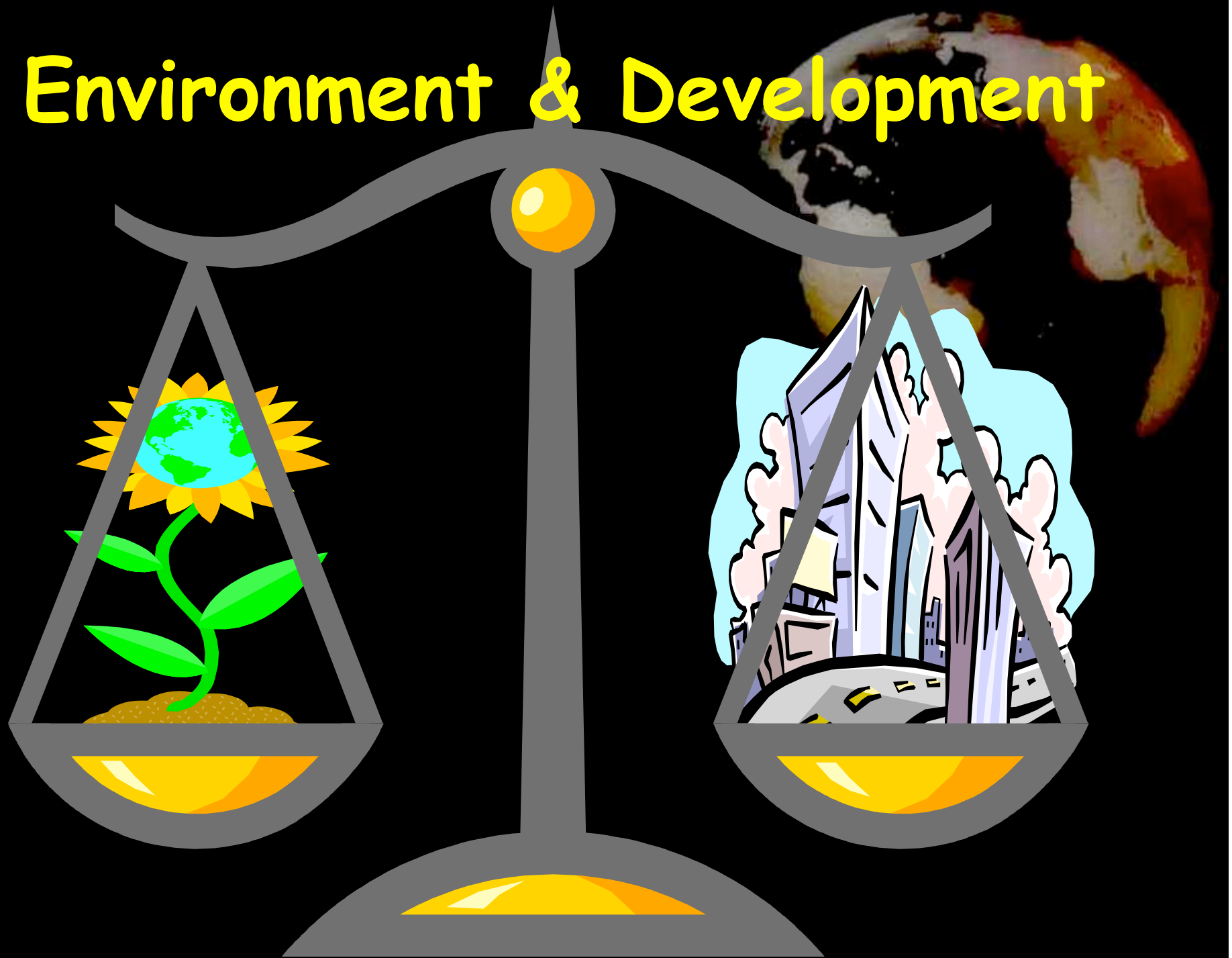
David Hutchinson

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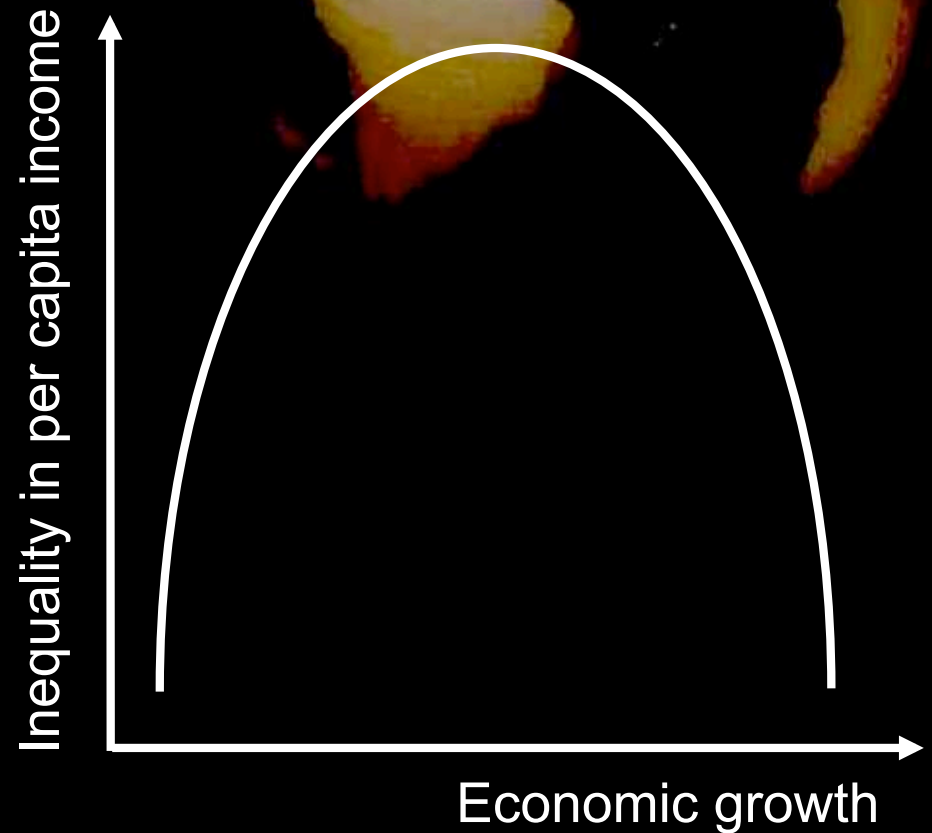
# Environment & Development



# Patterns in Biodiversity:

## *Introducing Environmental Kuznets Curves (EKC)*

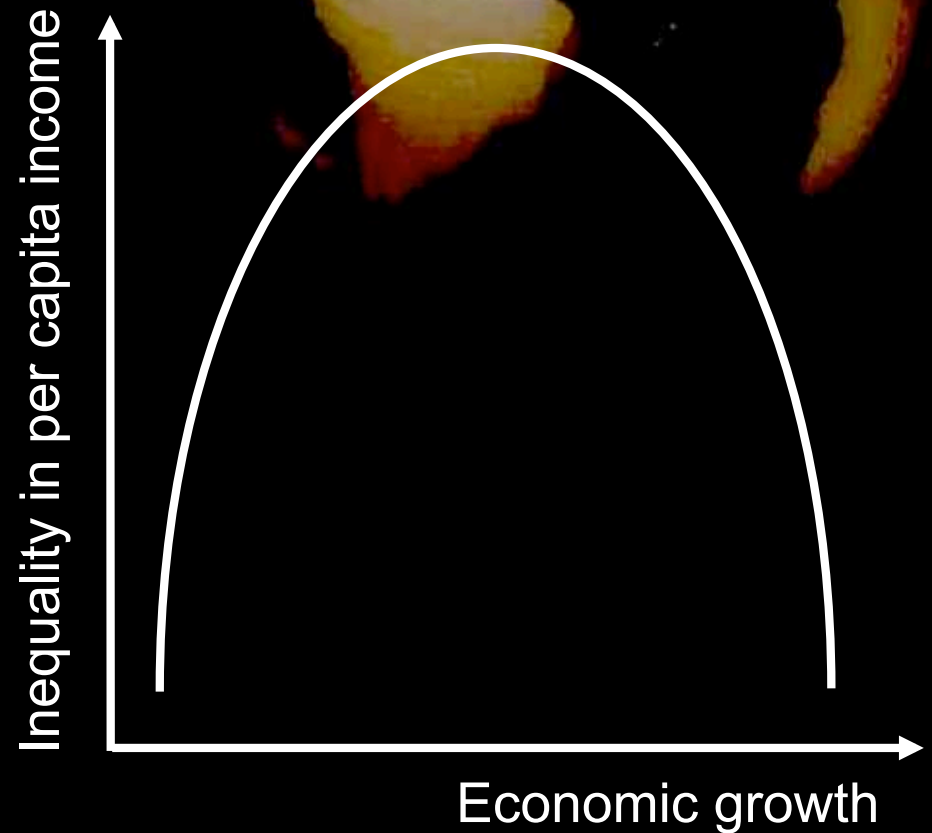
- 🇺🇸 Kuznets (1955) – inequality vs. economic growth



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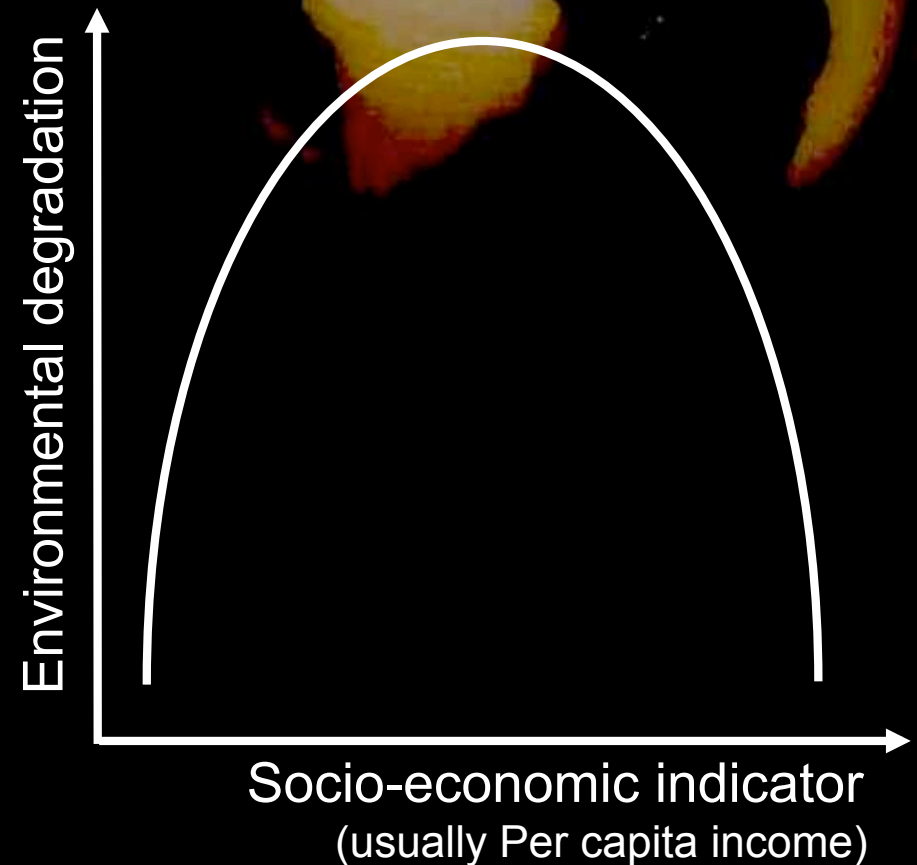
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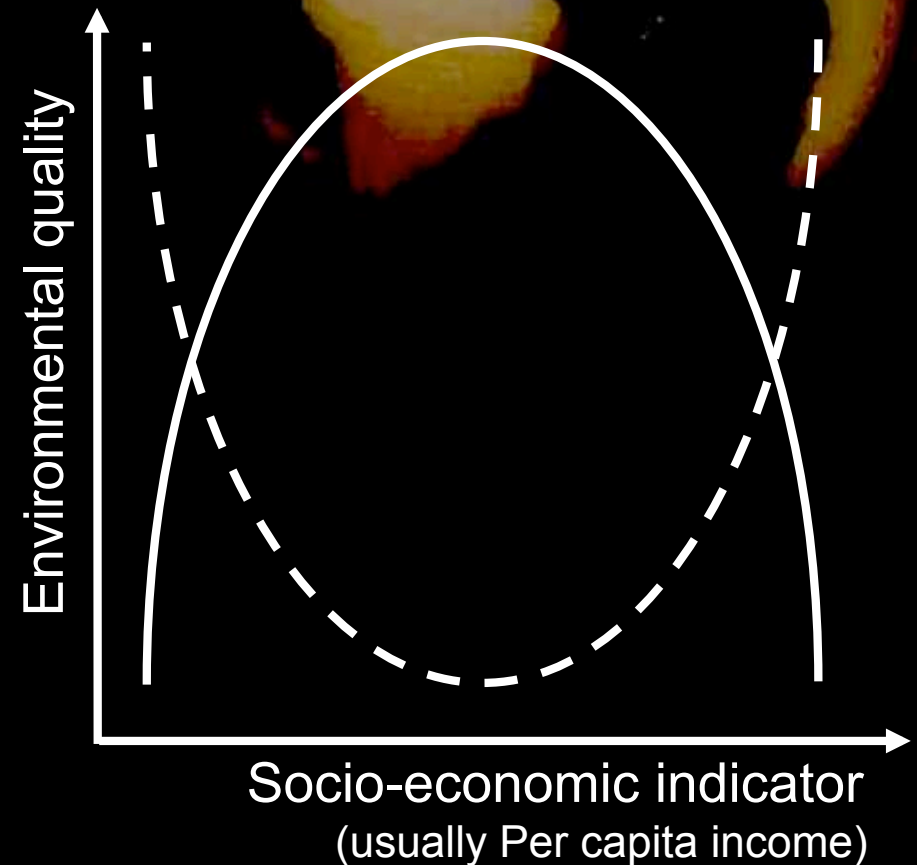
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- Adapted (1990s) – EKC
- Measure of environmental condition vs. social indicator



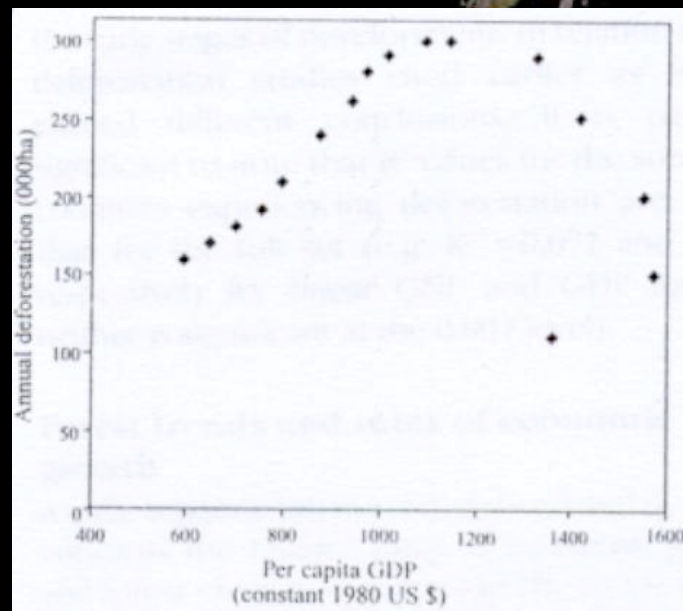
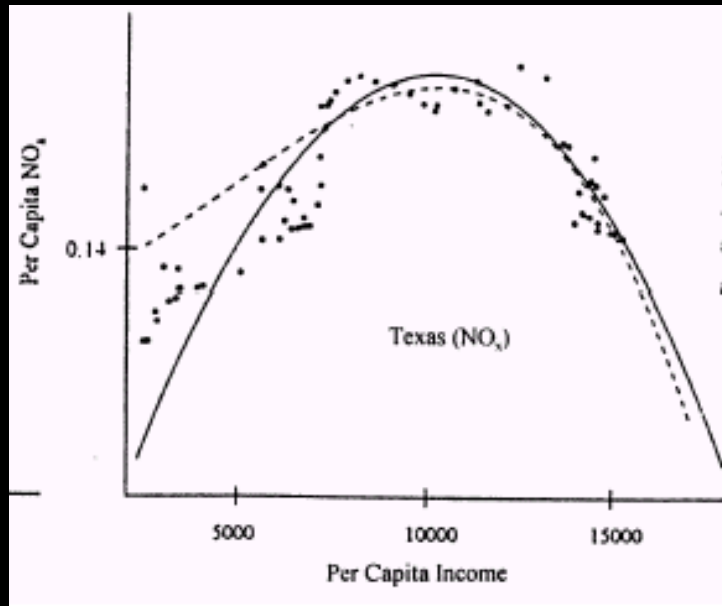
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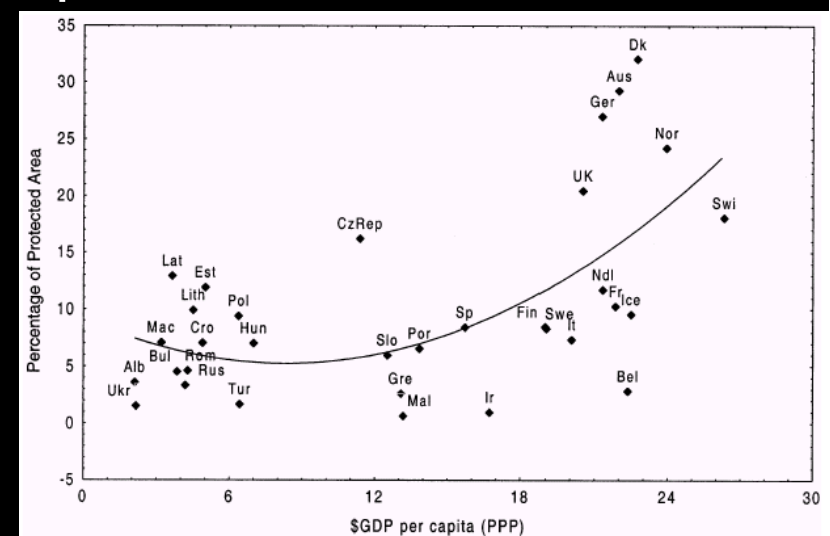
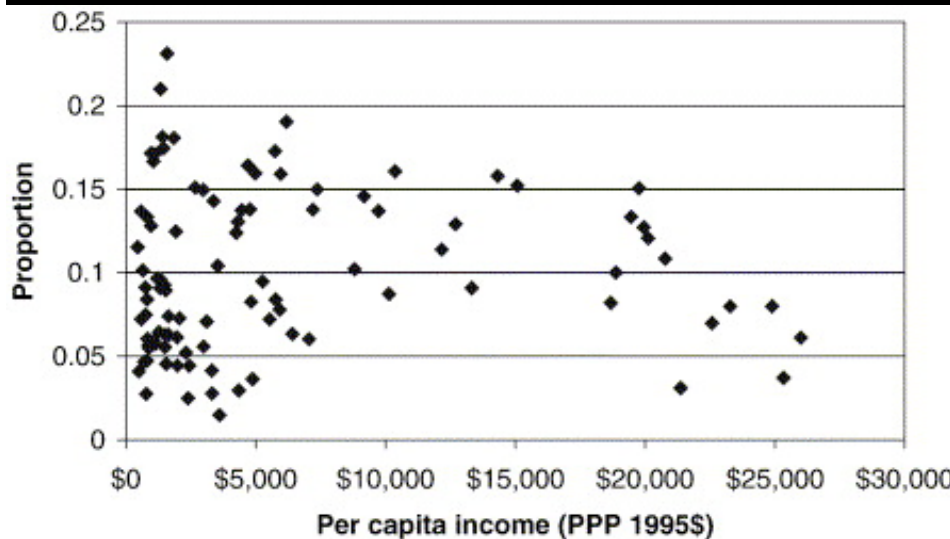
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# Does Kuznets exist



- Concentrations of  $\text{NO}_x$  (List & Gallet, 1999)
- deforestation rates (Mather, 1999)
- Threatened species (McPherson et al. 2004)
- % protected areas (Bimonte, 2002)





# Do EKC's exist in marine ecosystems?



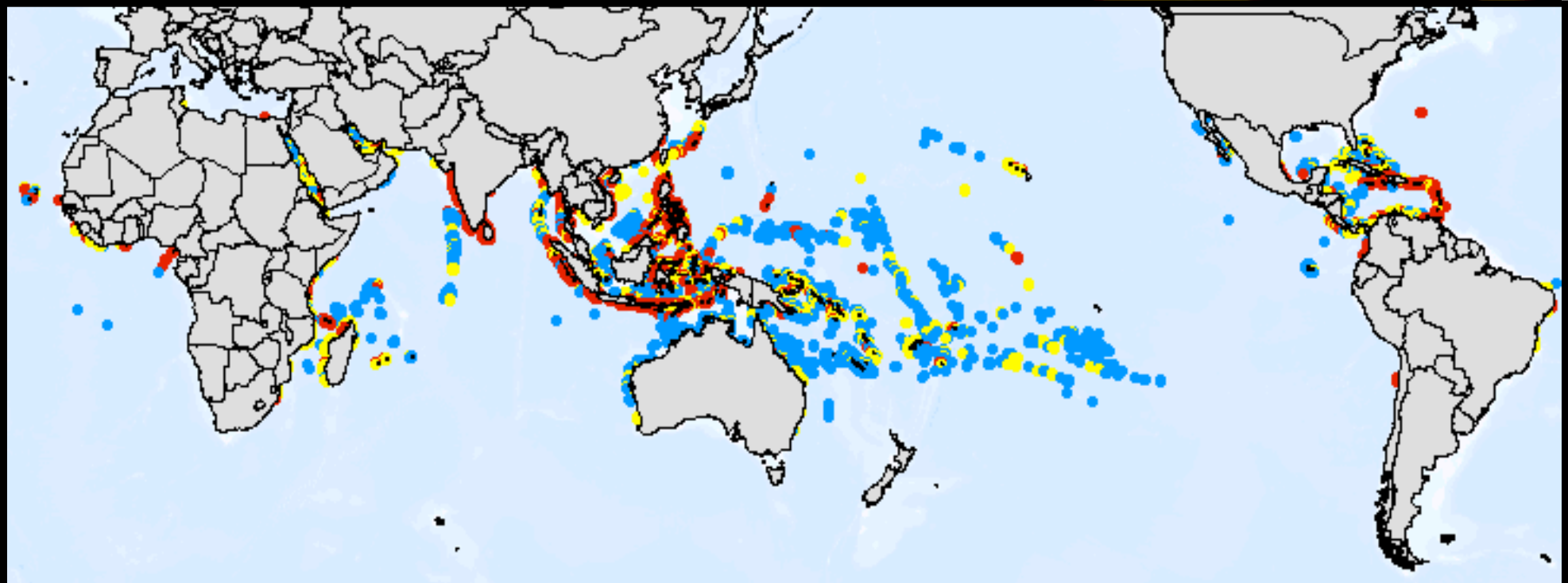




**overexploitation  
and destructive  
fishing**



# Reefs at Risk Indicator

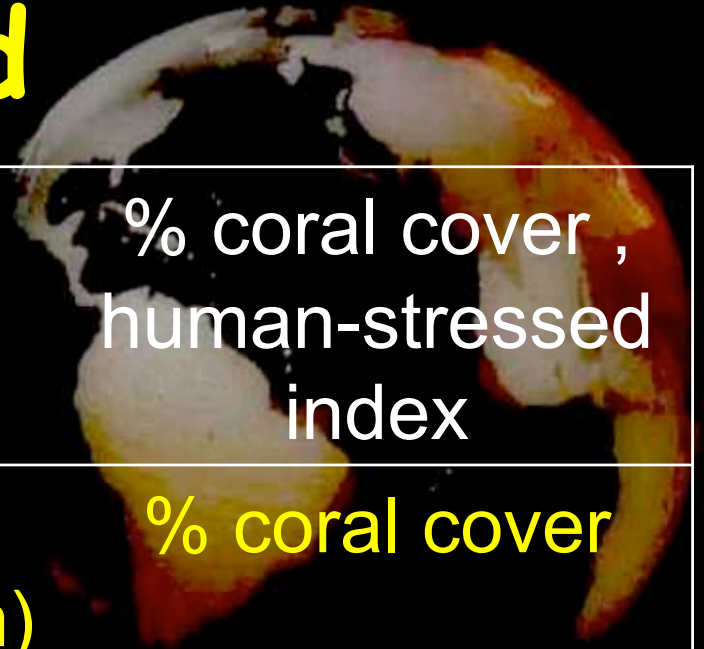


■ Low   ■ Medium   ■ High

[www.wri.org](http://www.wri.org)



# Data used



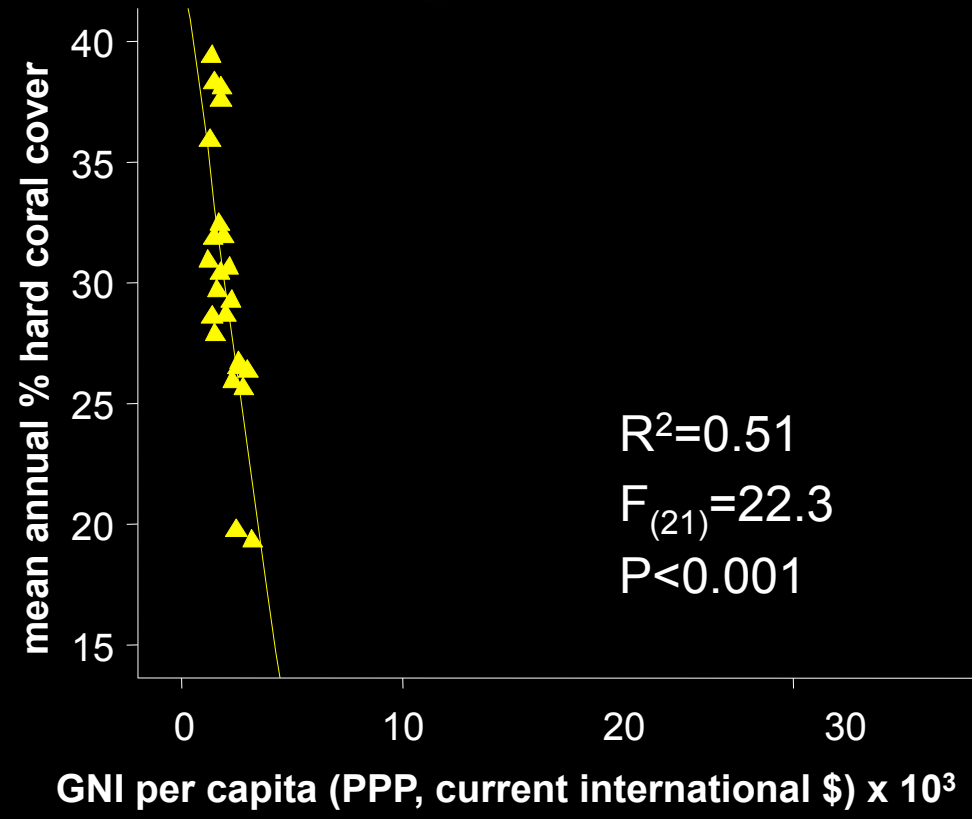
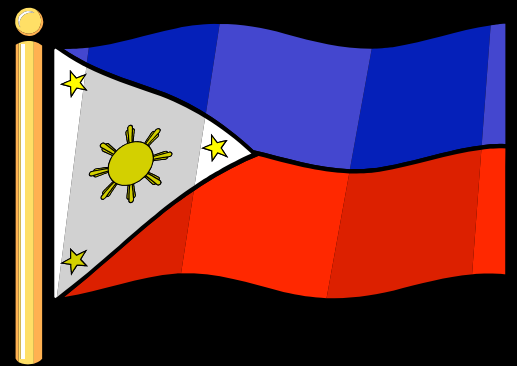
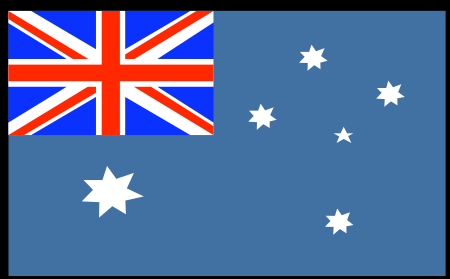
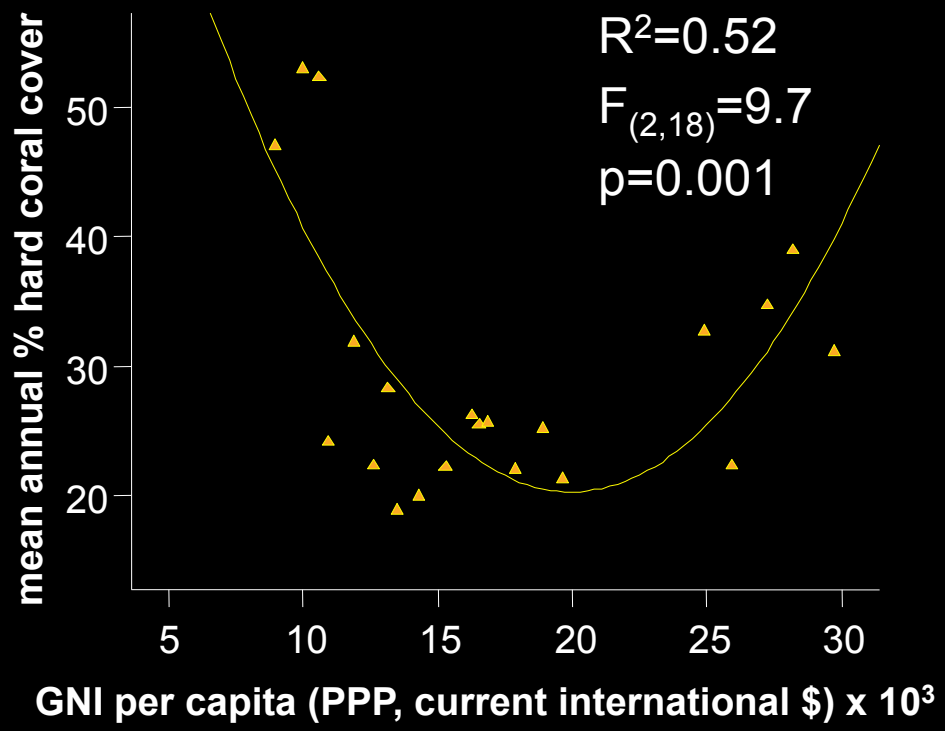
Reefbase	<a href="http://www.reefbase.org">www.reefbase.org</a> ; CD	% coral cover , human-stressed index
Reefcheck	<a href="http://www.reefcheck.org">www.reefcheck.org</a> ; Hodgson (pers comm)	% coral cover
CARICOMP	<a href="http://www.unesco.org/csi">www.unesco.org/csi</a>	% coral cover
WCMC	<a href="http://www.unep-wcmc.org">www.unep-wcmc.org</a>	Area within MPA
World Bank	World development indicators	GDP (PPP int\$), life expectancy, adult literacy
Freedom house	<a href="http://freedomhouse.org">freedomhouse.org</a>	Political index



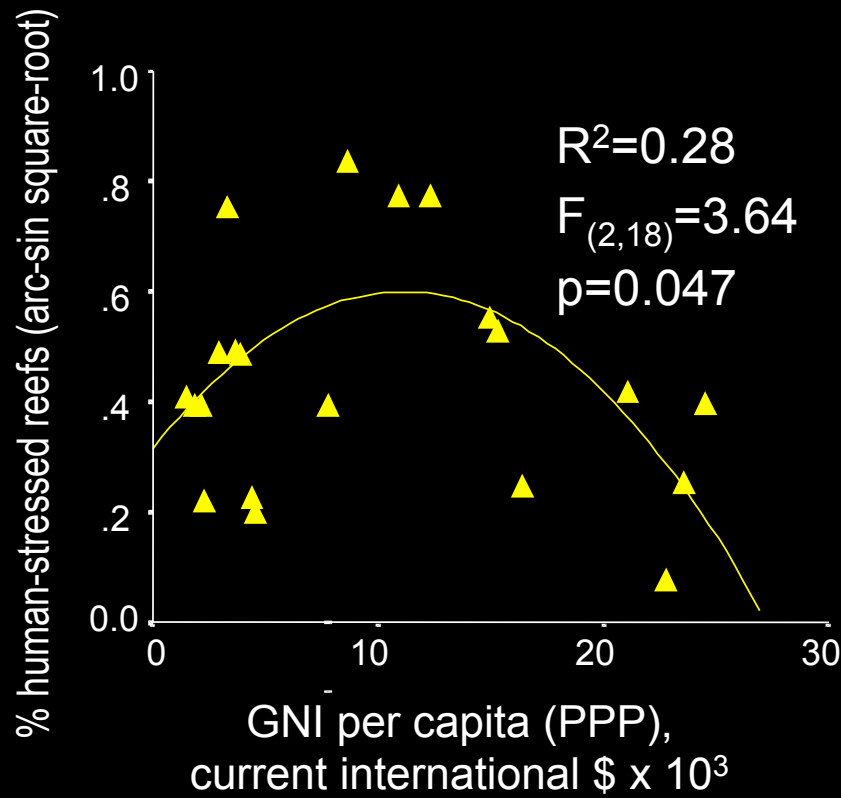




# Intra-country analysis

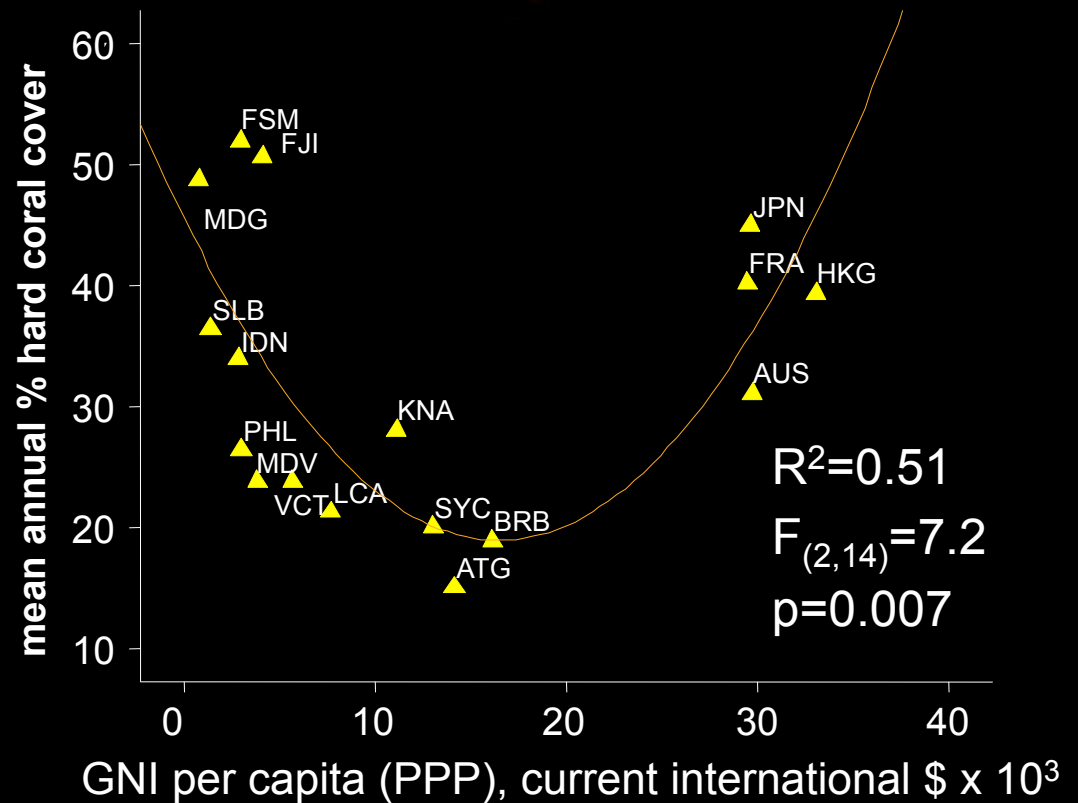


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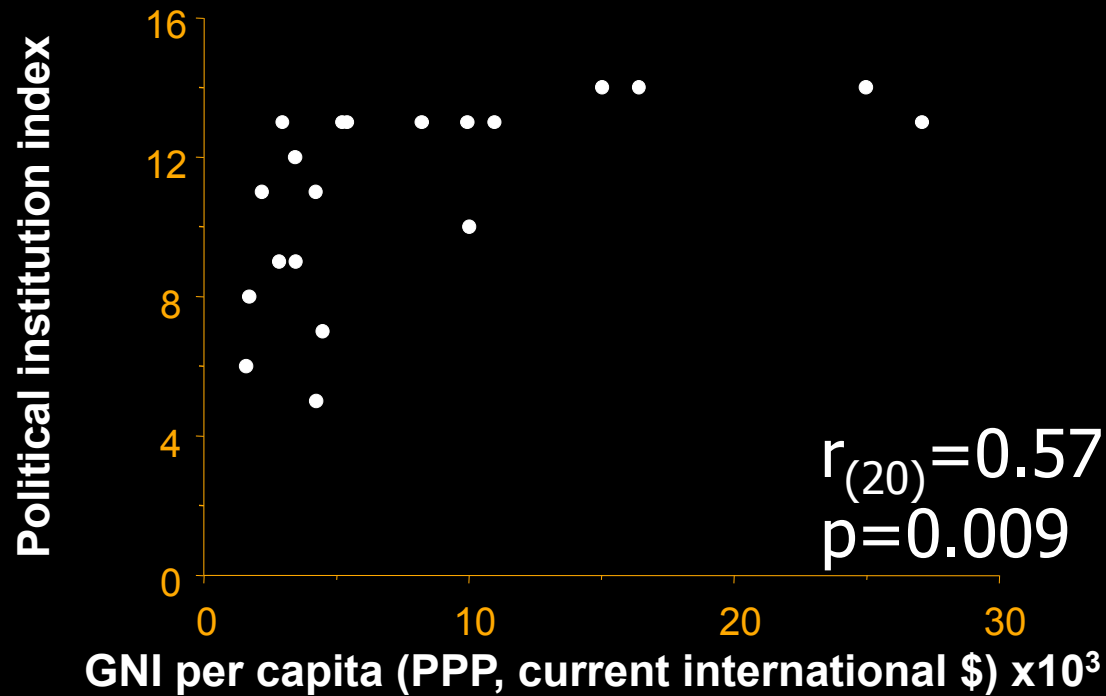
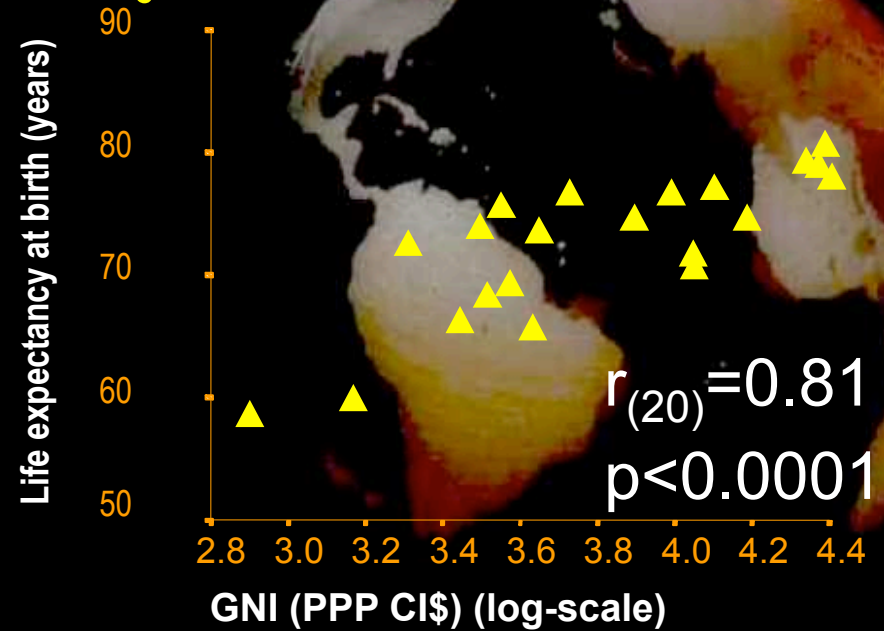
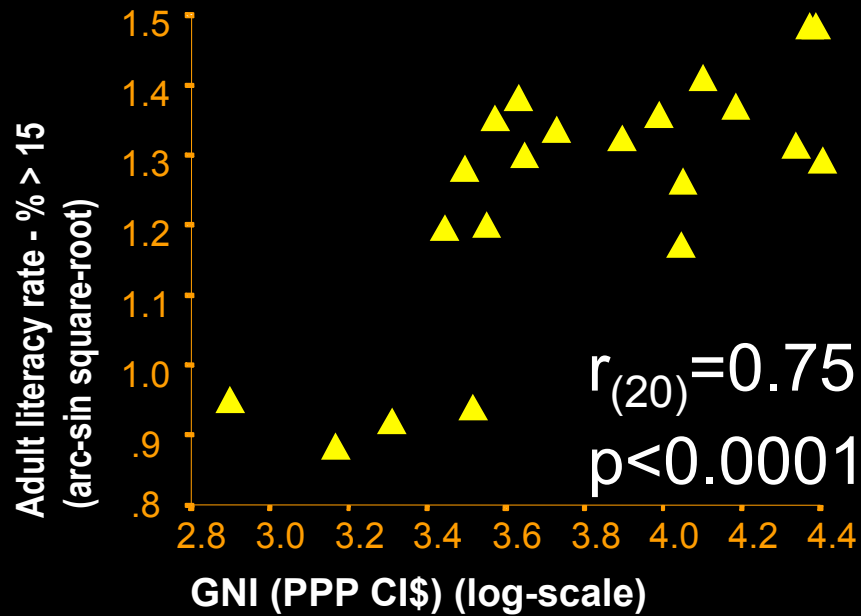


Human-stressed reefs

Hard coral cover



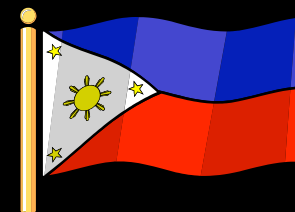
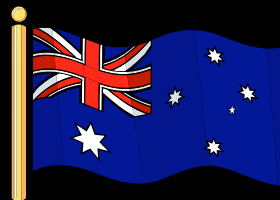
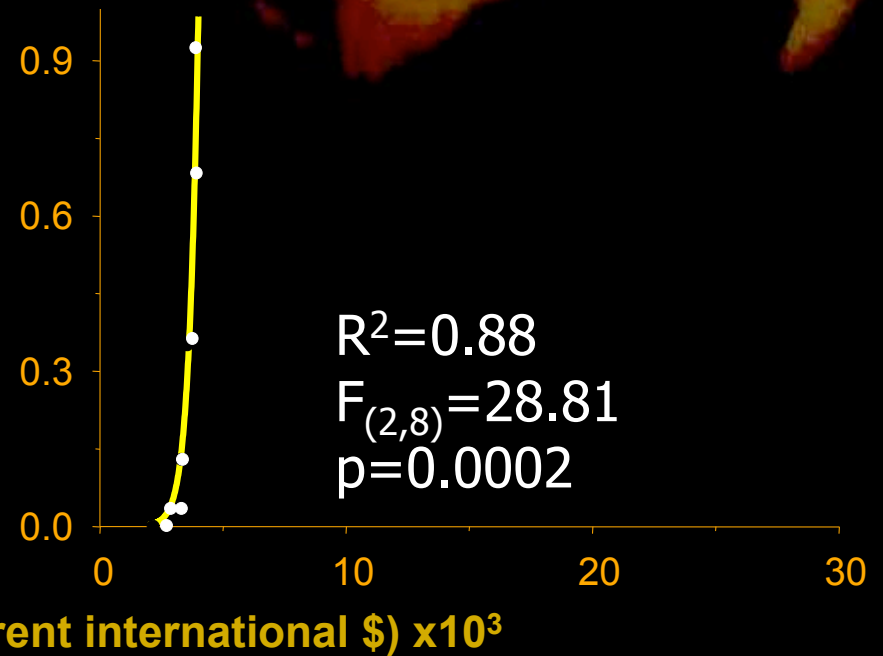
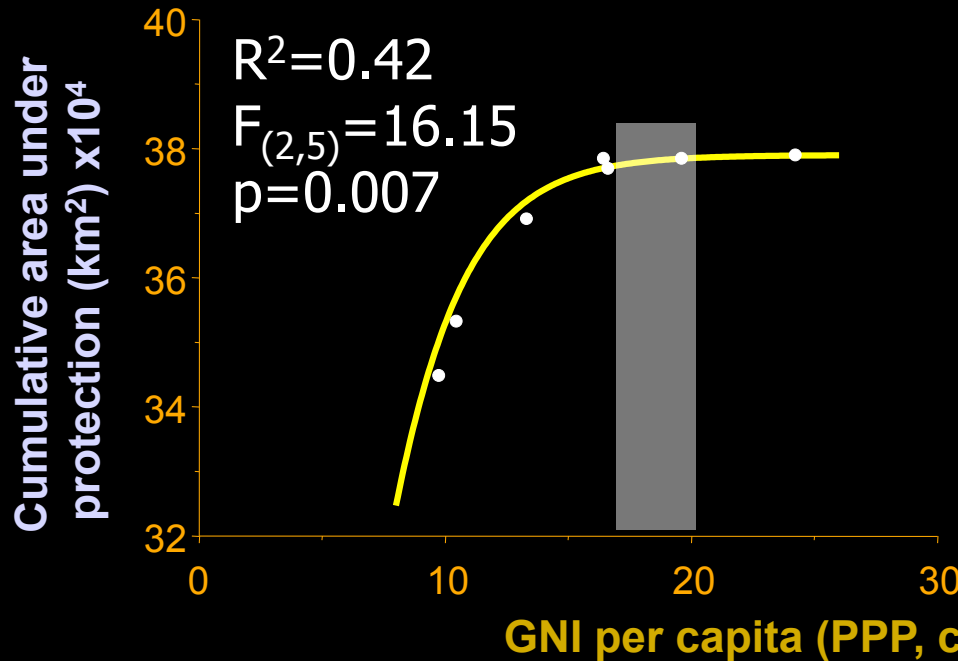
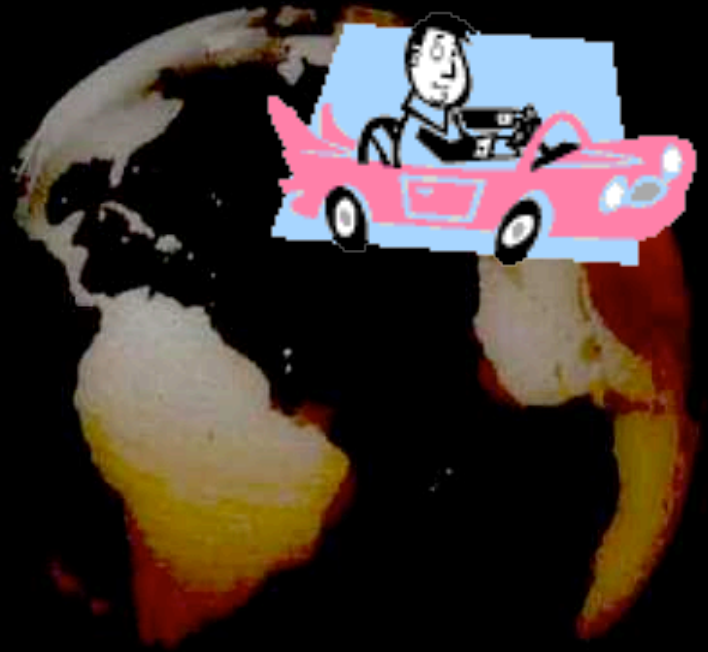
# Correlates of wealth

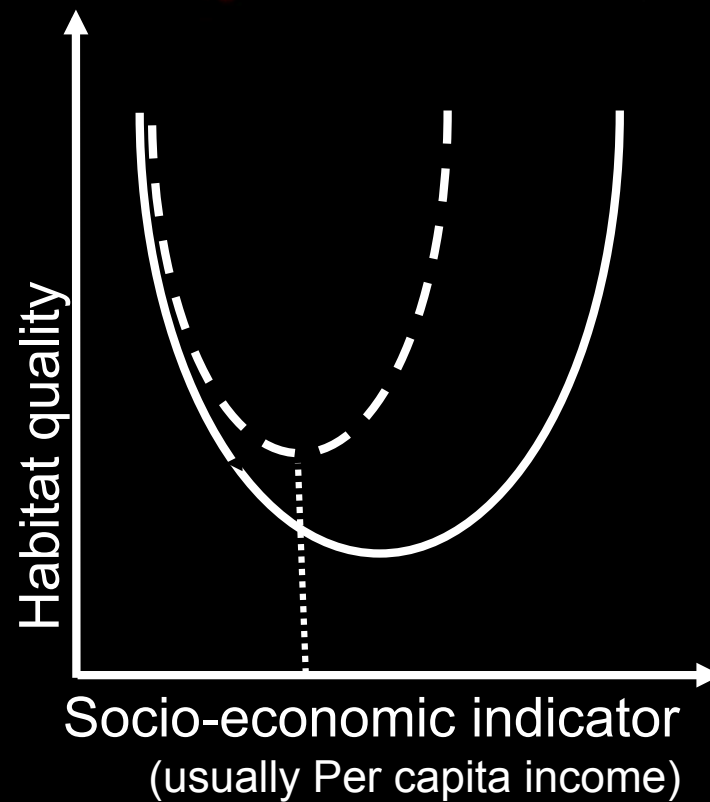
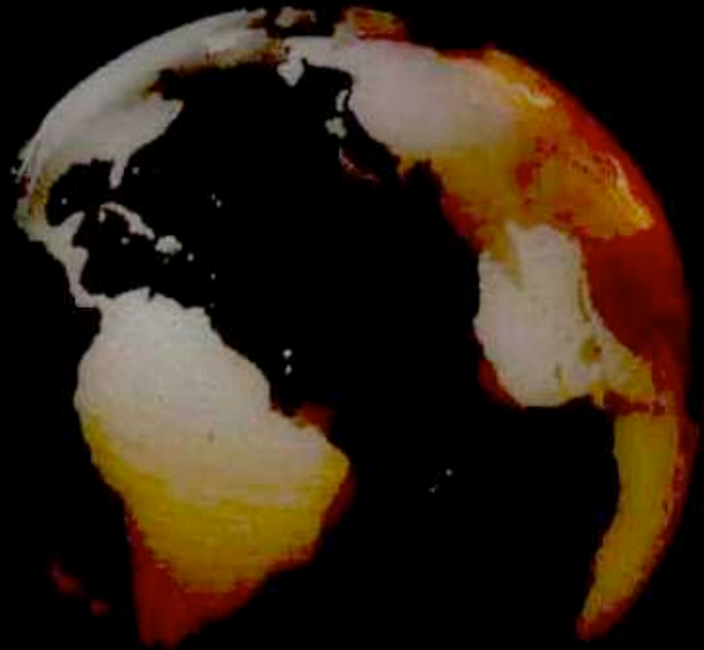
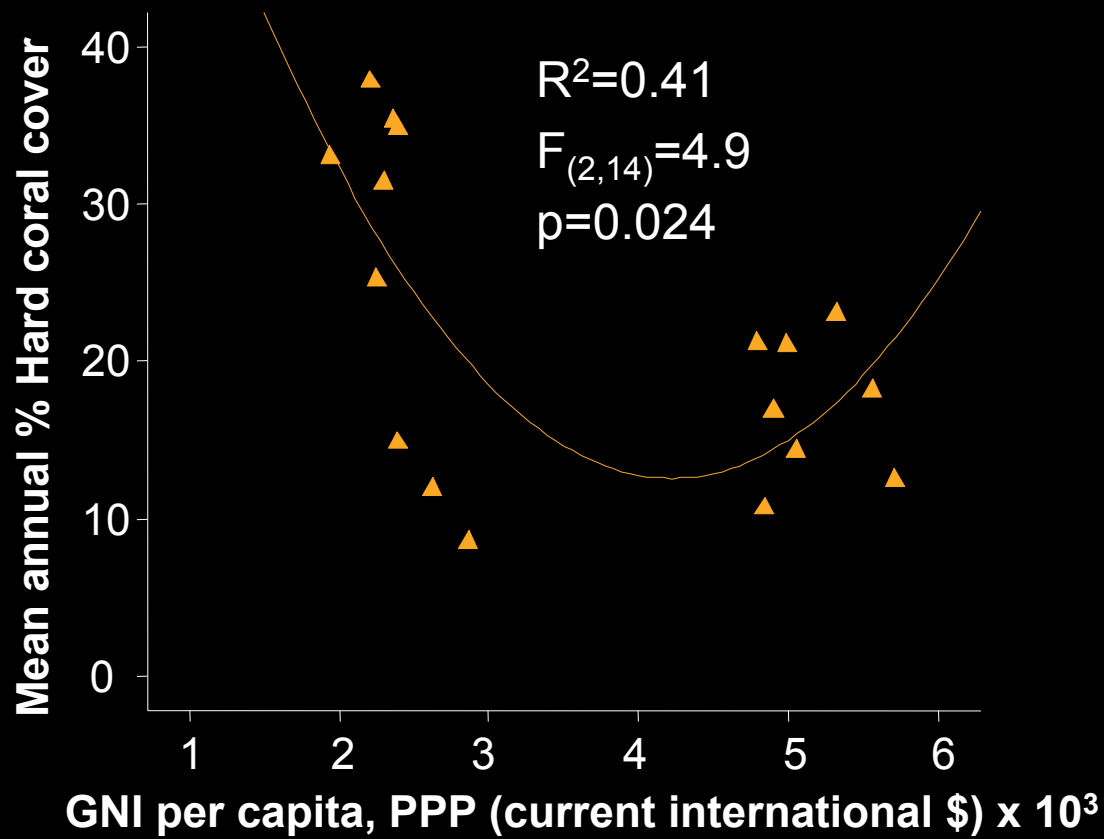




# "Catalysts"

- water quality?
- Area within protection?





# In Summary:

- Useful exploratory tool
- GDP useful indicator, but in turn is correlated with a whole suite of variables
- Solution will NOT*** come by simply pursuing economic growth ...
- Sound under-pinning of political & institutional arrangements; mindful of sustainable development.





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