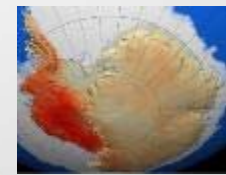


**SCIENCE  
PRIORITIES...**

**DEFINE**

*the global reach of the Antarctic  
atmosphere and Southern Ocean*



Stieg et al 2009

**UNDERSTAND**

*how, where and why ice  
sheets lose mass*



**RECOGNIZE  
AND MITIGATE**

*human influences*



**OBSERVE**

*space and the Universe*



**Antarctic  
and  
Southern  
Ocean Science**

**REVEAL**

*Antarctica's  
history*



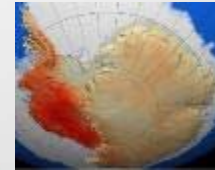
**LEARN**

*how Antarctic life  
evolved and  
survived*

# THE CHALLENGE...

**SUSTAIN  
STABLE FUNDING**

**COMMUNICATE**  
*with all stakeholders*

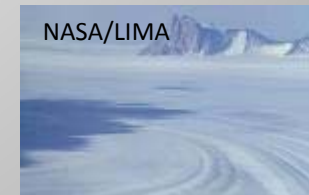


Stieg et al 2009

**PROVIDE ACCESS**  
*Region-wide  
Year-round*



**ENHANCE  
INTERNATIONAL  
COOPERATION**



**APPLY EMERGING  
TECHNOLOGIES**

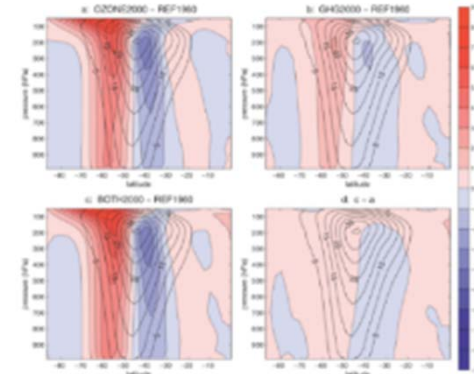
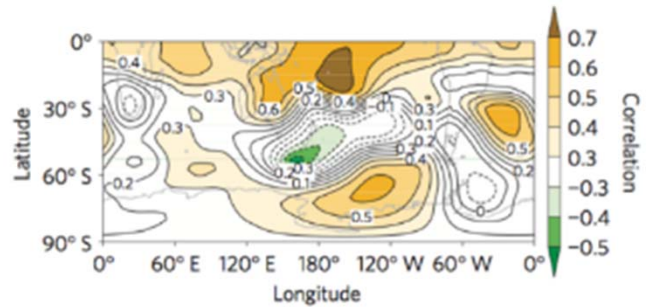


**STRENGTHEN  
ENVIRONMENTAL  
PROTECTION**

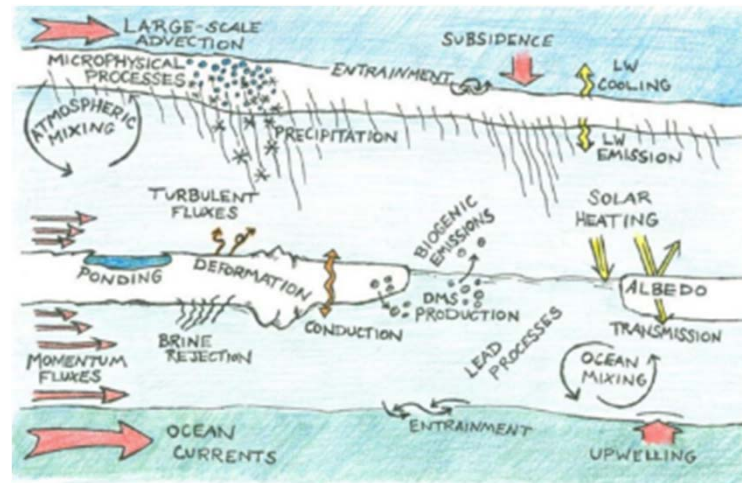


# Antarctic Atmosphere and Global Connections

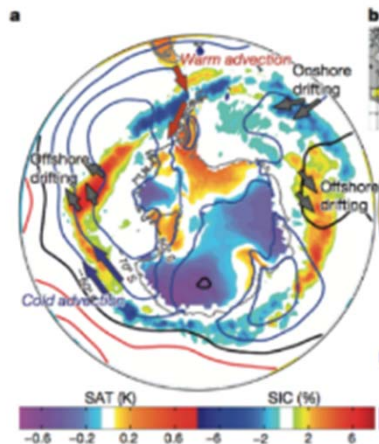
## Tele-connections



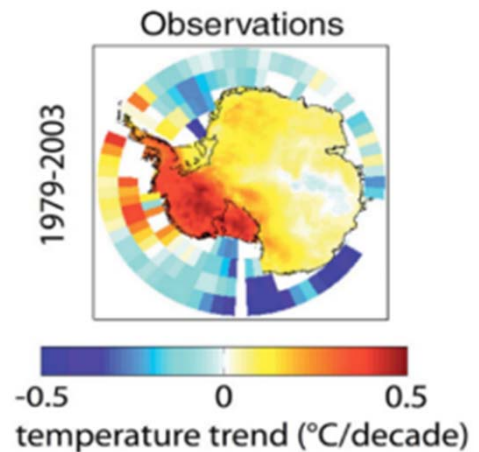
## Processes and interfaces

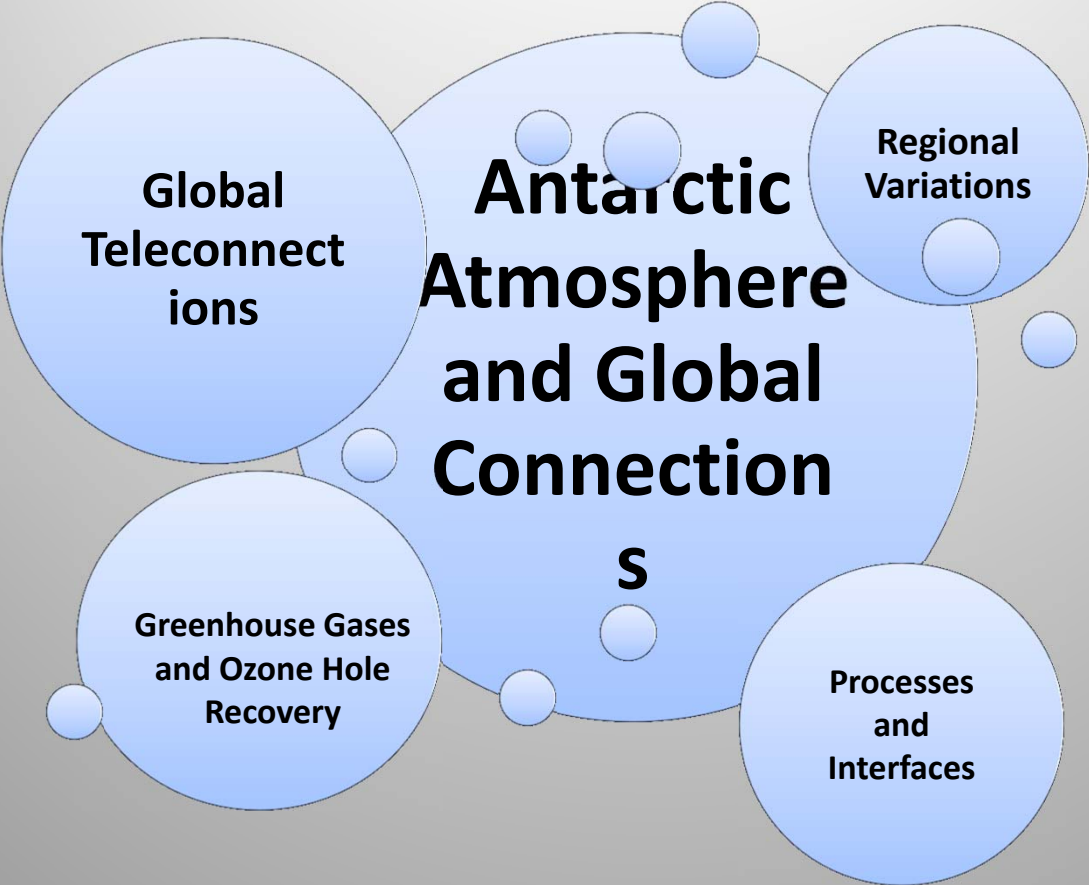


## Greenhouse gases/Ozone recovery



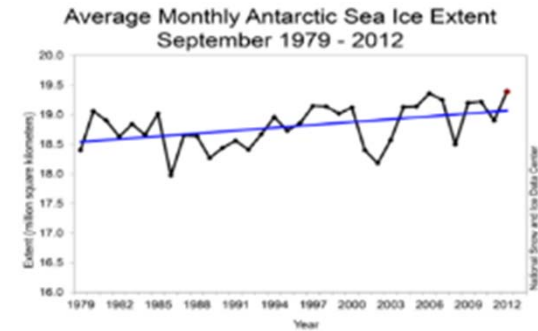
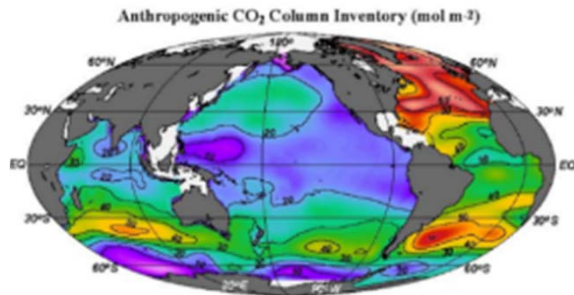
## Regional variations



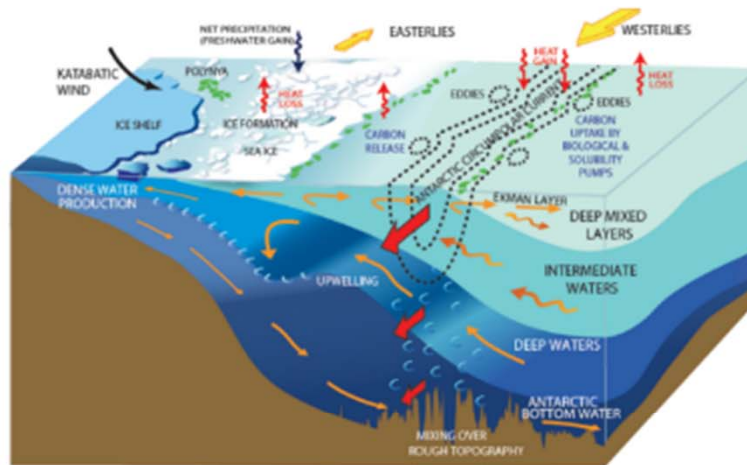


# The Southern Ocean and Sea Ice in a Warming World

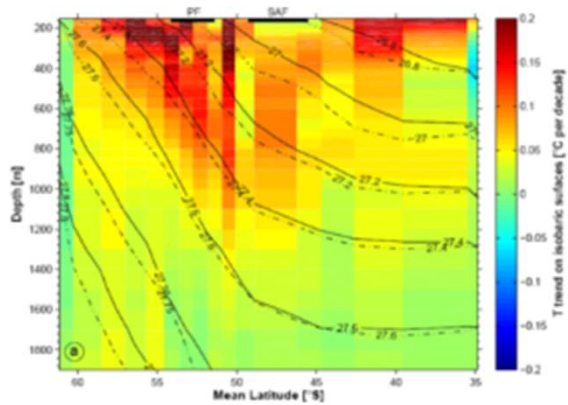
Human role in ocean change



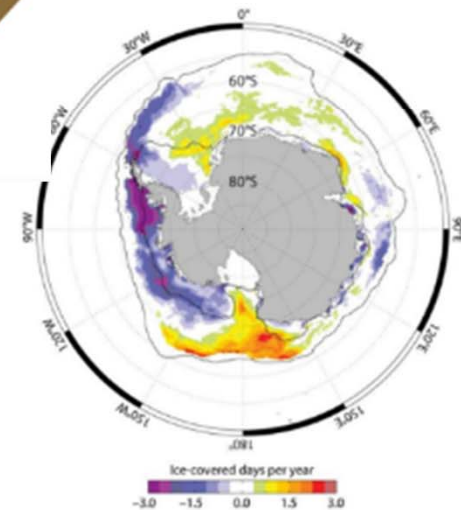
Heat, energy, carbon dioxide, carbon, oxygen and nutrient cycles and budgets



Sea ice variability



Improved climate forecasts



**Defining the human role in ocean change**

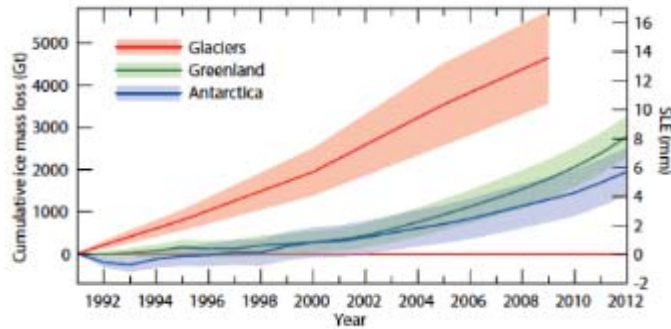
**The Southern Ocean and Sea Ice In a Warming World**

**Heat, energy, and CO2 cycles and budgets**

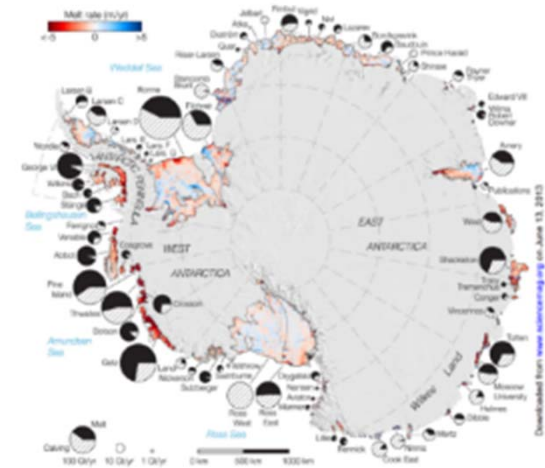
**Ocean warming and sea ice variability**

**Carbon, oxygen and nutrient cycles and budgets**

# Antarctic ice sheet and sea level



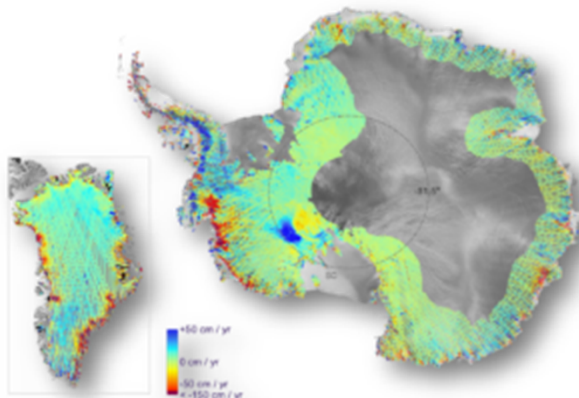
## Controls and processes



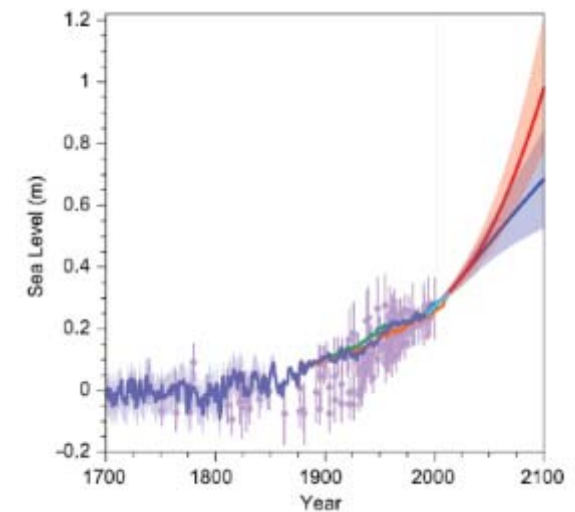
Ice sheet thinning, retreat, and melt

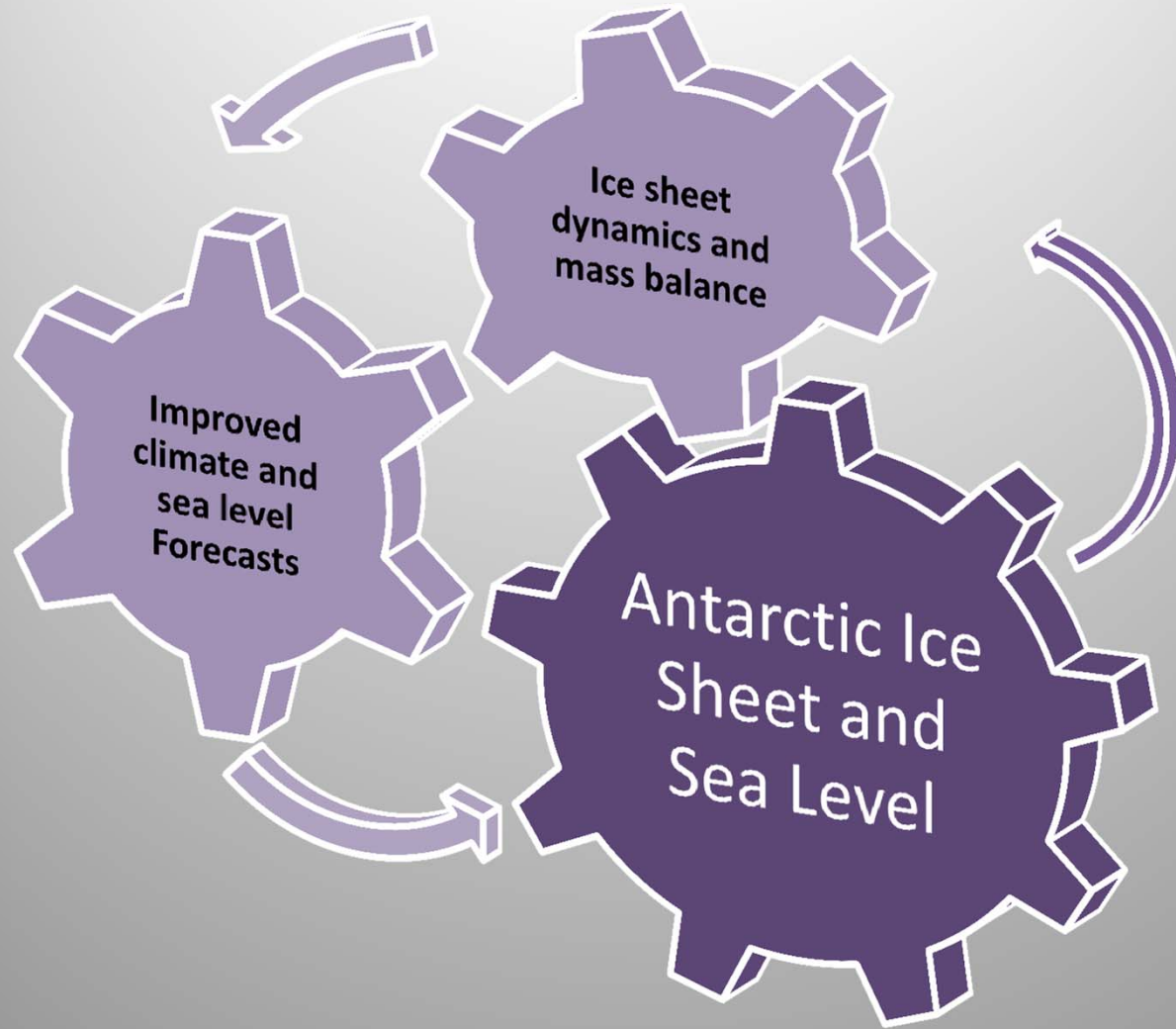


Sea level



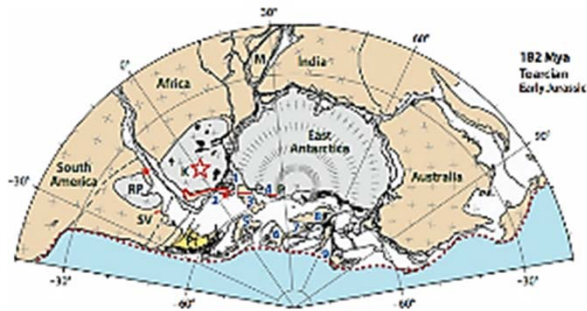
Improved climate and sea level forecasts





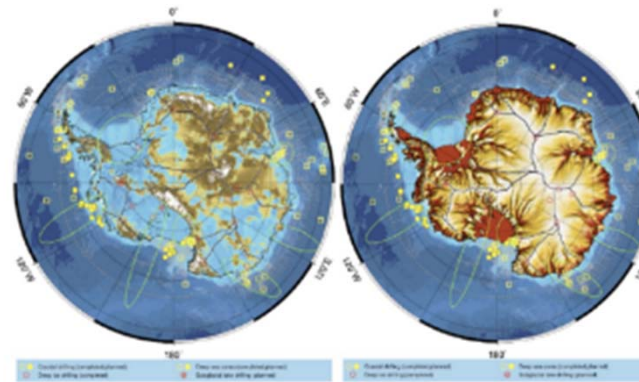
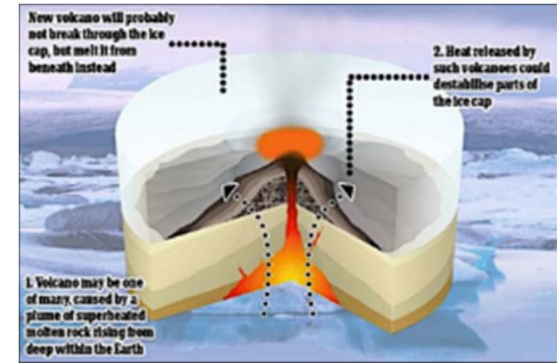


# Dynamic earth – probing beneath Antarctic ice

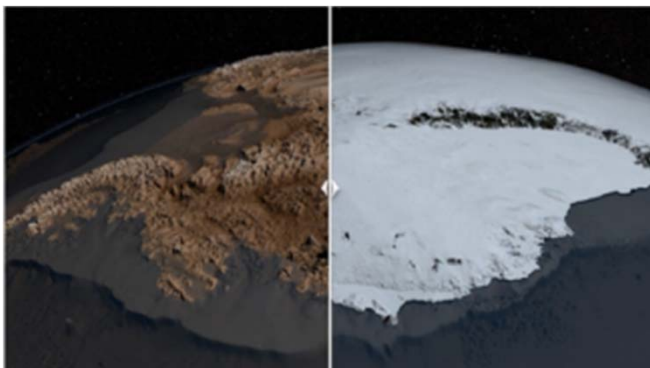


## Super continent assembly

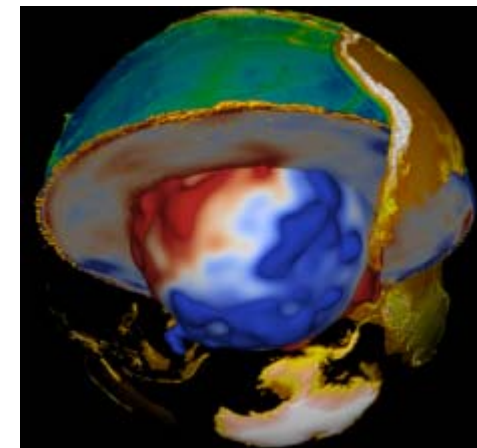
## Heat flux and volcanism



## Deep Earth structure



## Cryospheric feedbacks



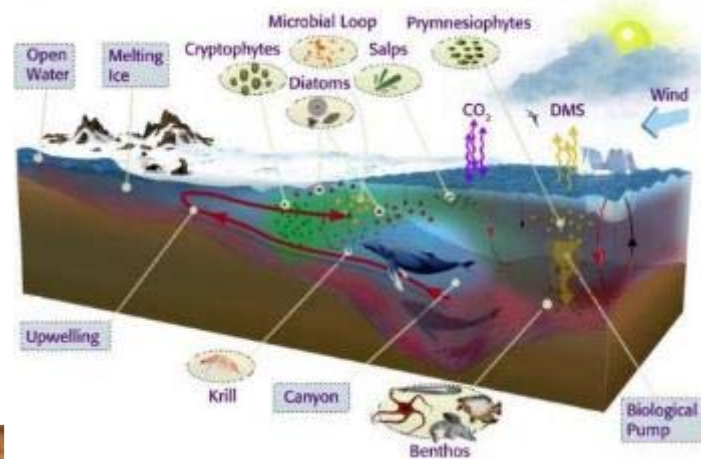
# Antarctic life on the precipice



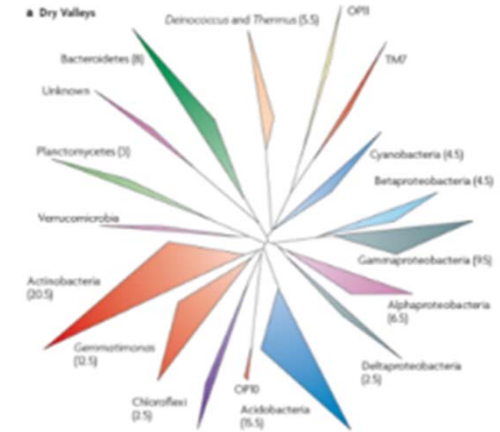
Adaptation and biodiversity



Ecosystem structure and function



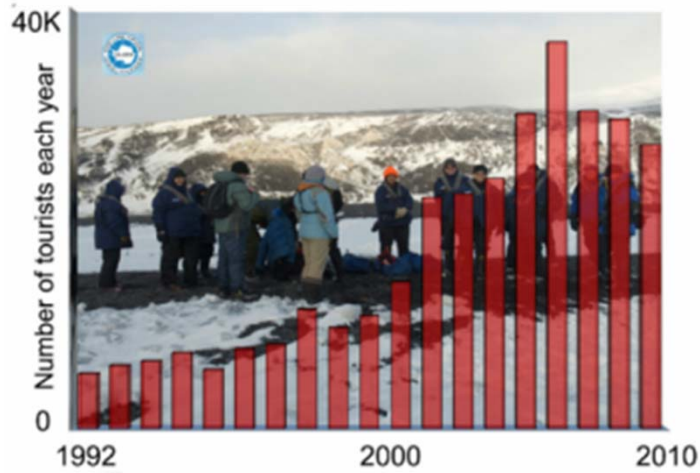
Conservation science



Environmental drivers

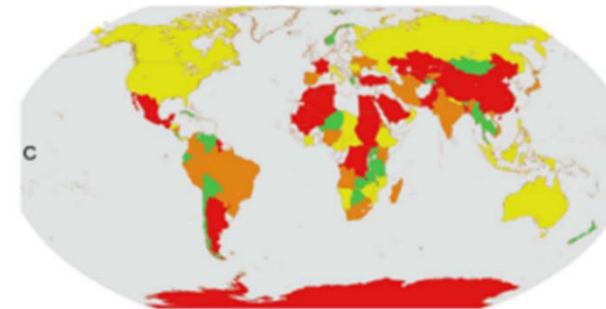
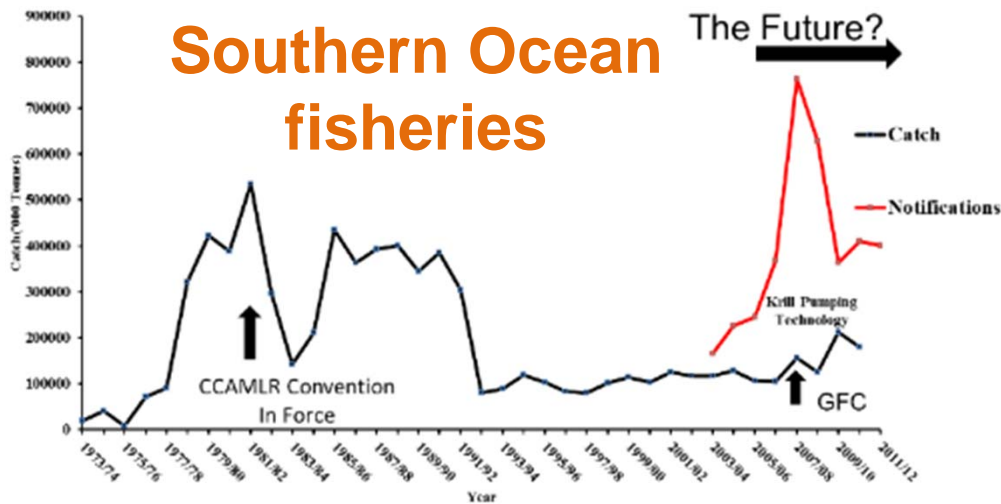


# Human presence in Antarctica



Tourism

Scientific footprint



Antarctica: 69<sup>th</sup> out of 84, between Mali and Kazakhstan

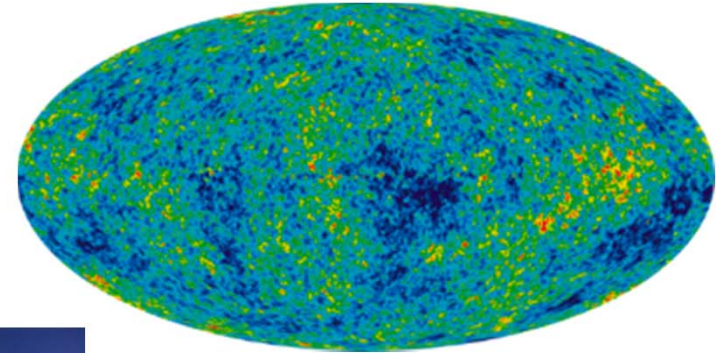
Conservation, protection, ecosystem services, and governance

# Near-Earth space and beyond – eyes on the sky

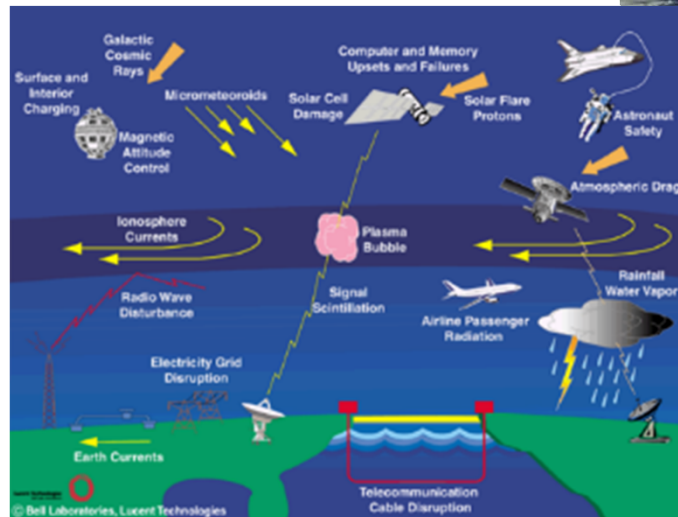
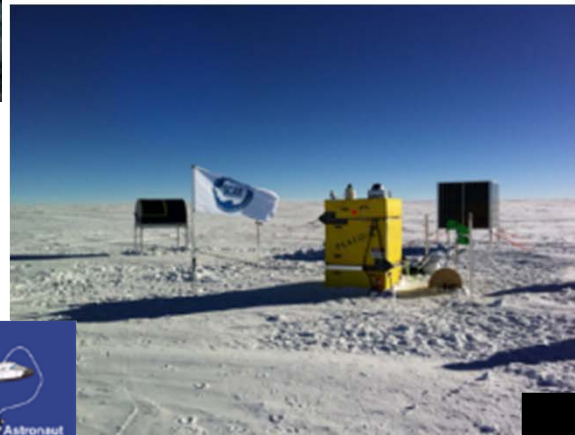


Life beyond Earth

The origins of the Universe



The nature of the dark Universe



Space weather

