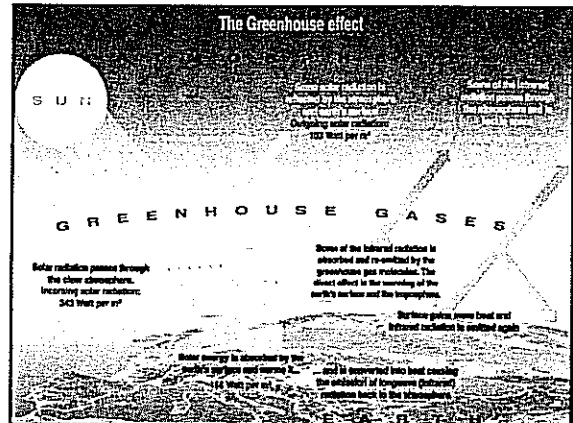


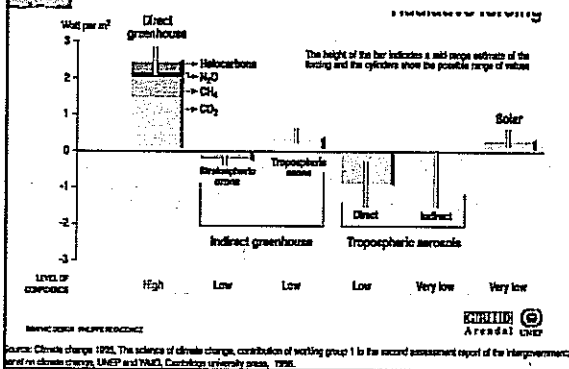
Climate Change and Namibia

Bob Scholes
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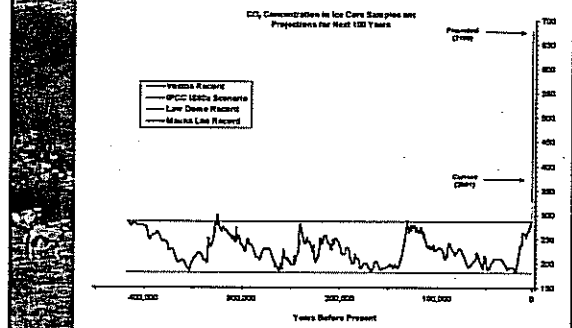
Lead Author, Third Assessment Report
 Intergovernmental Panel on Climate Change
 Team Leader, Namibia First National
 Communication to the UNFCCC



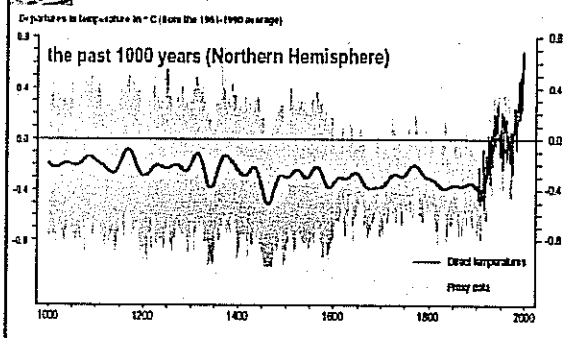
Radiative forcing



Unprecedented in the history of our species

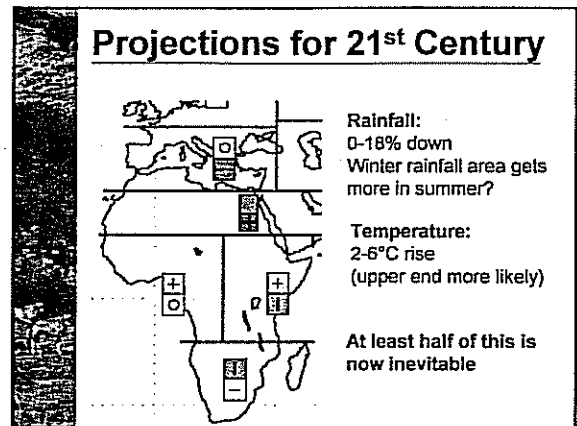
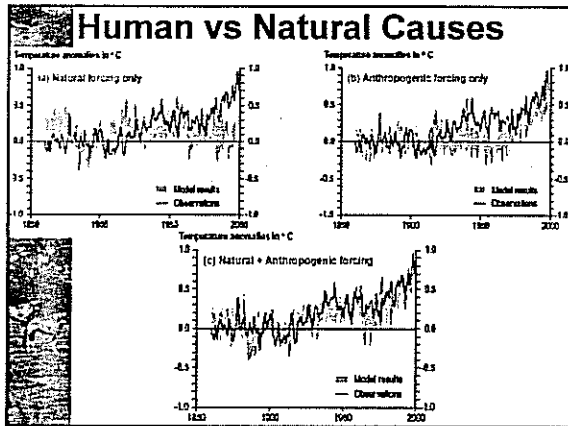


Tree rings: a proxy for temperature

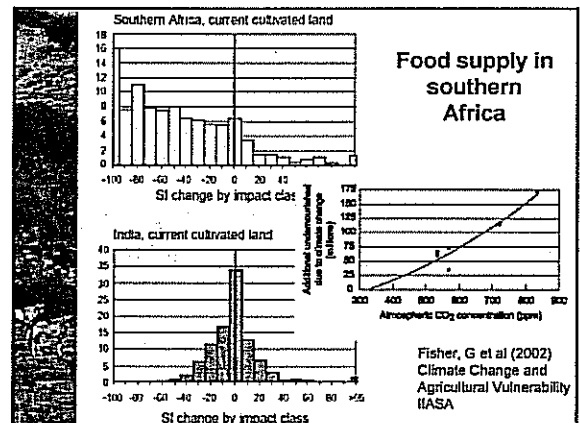


The climate record at Windhoek

- Mean Annual Temperature has increased by 1.2°C since 1920
 - Some of this may be urban heat island effect
 - Interannual variability is about 1°C
- Rainfall shows a declining trend of 2.4 mm/decade (6.3% per century) since 1892
 - Interannual variability (CV) is about 30%

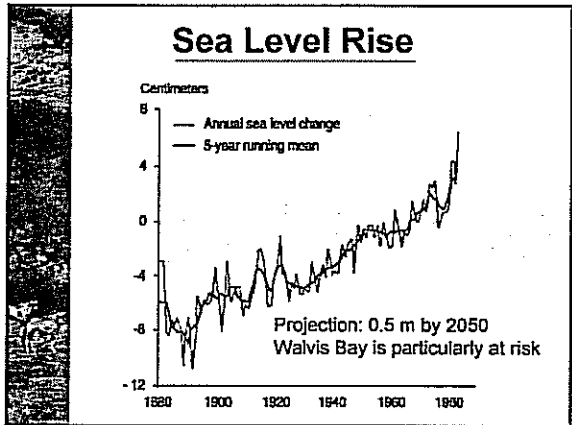
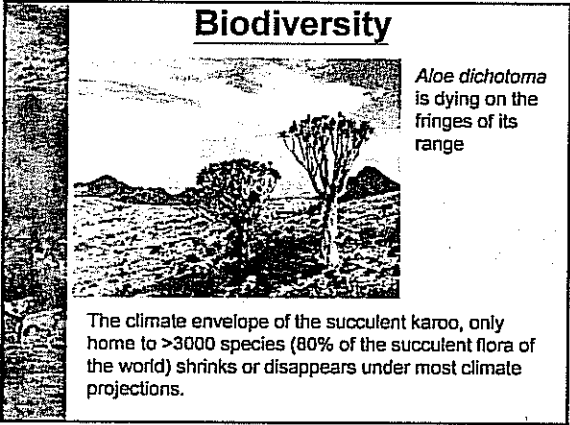
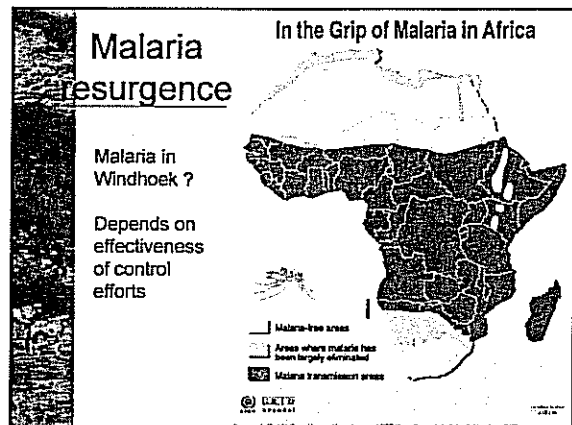
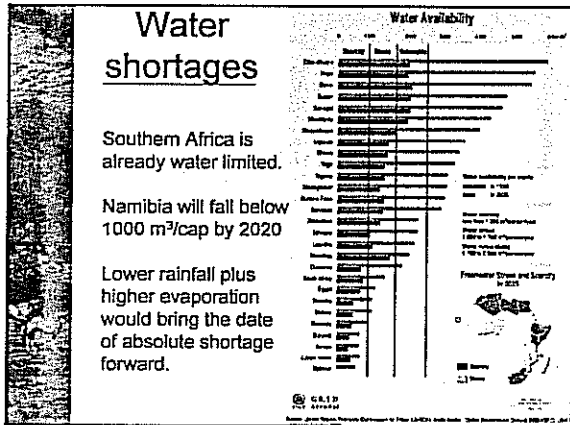


- ### Impacts on crop and range productivity
- Gross productivity of dryland crops and pasture grasses probably unaffected
 - Elevated CO₂ balances the drying trend
 - Irrigated crop productivity may increase, but irrigation water will be scarcer and more expensive



- ### Bush encroachment
- Some evidence that bush encroachment may partly be due to rising CO₂ and temperatures
 - Main effect is probably still management (overstocking and underburning)
 - Encroachment could become harder to control in future

- ### Heat Stress
- European breeds approach their tolerance limits over larger parts of the interior plateau
 - Bos indicus* breeds better adapted
 - Dairy cattle milk yield strongly affected by temperatures above 30°C
 - Seed set in some cereals (wheat, rice) declines above about 30°C



- ### Adaptation
- now a necessity
- Similar strategies as used for coping with climate variability
 - Conservative stocking rates
 - Heat tolerant breeds
 - Wildlife?
 - Emphasis on economic efficiency in irrigation systems
 - High value crops, low wastage

- ### Mitigation
- Namibia contributes 5.6 Tg CO₂ equivalent annually to the greenhouse problem
 - 0.013% of global total, 1/100th of South Africa
 - 66% of this is from agriculture, mostly through methane
 - Actually, due to bush encroachment, Namibia may be a net greenhouse gas sink
 - Can't claim credits for this under current Kyoto rules
 - Hydro, gas, solar, biomass and wind energy are all favourable



Some take-home messages

- **Is the climate changing?**
 - Yes, beyond reasonable doubt
- **Is it changing because of us?**
 - About ¾ of the effect is human
- **Does it matter?**
 - Winners and losers (Namibia loses)
- **What can be done about it?**
 - Adaptation and mitigation technologies exist