

Natural environment impacts
predicted with climate change

Impacts on individual plants

- Projected change can cause spatial shifts in plant distribution
 - Contracted ranges
- Changes in species composition
 - Structural changes: species habitats
 - Economic impacts – e.g. Mopane in rural landscapes
 - Centres of endemism - reduced species numbers
- High risk that rare and vulnerable species can lose all available range by 2085

Impacts on animals

- Slightly harder to predict
- Contraction of ranges into high interior grasslands and eastwards towards humid regions
- Increased dry season aridity
 - Reduced productivity, tree death, lower nutritional benefits to consumers
- Population declines
- Increase in critically endangered and extinct species
 - Ability to shift range hampered by land-use

Ecosystems

- Ecosystems are threatened by
 - Land transformation, N deposition, alien invasive species spread
 - Vulnerabilities exacerbated by climate change
- Biome distributions are controlled by climate and fire
 - Complex response to changing climate
- Predict biome changes in grasslands and savannas
 - Tree increase in savanna
 - Savanna encroachment into grasslands
 - Exotic tree cover increase in grasslands

Tree : grass balance

- Large increase in tree cover
- Carbon 'fertilisation'
- Faster growth in wet savanna
 - Increased C = increase root storage
 - Larger storage allows trees to grow faster
 - Escape fire trap
- Increase water use efficiency in arid areas
 - Improved survival and growth

Fire

- Extreme fire conditions may increase
- 30:30:30
 - +30 deg; +30 knots: -30% humidity +++ dry fuel
 - Increasing temperature in cooler seasons makes these conditions more likely

Water

- Increase in evaporation & Increase rainfall (intensity)
- Increased flooding
- Increase in drought
- Increased erosion
 - Poorer water quality
 - Algal blooms
- Reduced ground-water recharge
- Strong impacts for commercial and rain-fed agriculture
 - Poor water quality, reduced quantity, increased expenses (soil particles in irrigation sprays)

Understanding Impacts

- To develop effective responses, individual - national
 - Understand the nature of the climatic and ecological changes that are likely to occur in their region.
 - Increase awareness and monitoring so adjustments in management strategies can be made
 - Planners and managers need to be reasonably informed about trends in climate, and potential consequences of climate change,
 - Develop local monitoring and adaptation strategies