

# Climate change in Mauritius

The current state of knowledge

## Recorded temperature changes

Temperature variation at Plaisance (1950 - 2007)

Average temperature at Vacoas and Plaisance during the last ten years (1998-2008) was higher than that of the decade 1951- 60 by 0.74 and 1.1 °C respectively.

Source: Meteorological Services, Mauritius

## Recorded temperature changes

Temperature variation at Pte. Caenn (1950 - 2007)

Similar warming trends were also observed at Rodrigues, St Brandon and Agalega, where the temperature rise is in the range of 0.5 to 1.0 °C

Source: Meteorological Services, Mauritius

## Changes in averages and extremes

Schematic example: heat waves

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## Changes in extremes

Maximum Temperature During Summer Months (Dec-Jan-Feb) at Vacoas Period 1951-2008

At Vacoas during the last ten years summer maximum temperatures became warmer by an average of 1.0 °C. By all comparisons of temperatures the summer of 2008 – 2009 was a unique one: day time maxima stayed between 33 – 34 °C almost continuously for weeks.

Source: Meteorological Services, Mauritius

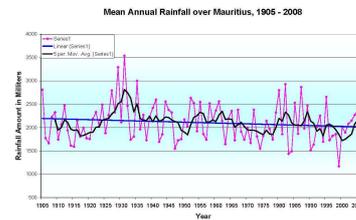
## Sea level rise

The mean sea level rise during the past decade (1998-2007) was 2.1 mm/yr at Port Louis. Tide gauge data from Rodrigues gives values of the same order of magnitude. Although these findings are consistent with IPCC conclusions, longer period of measurements are necessary for reliable conclusions.

Source: Meteorological Services, Mauritius



## Rainfall changes



Long-term time series of rainfall amount over the past century (1905 to 2008) show a decreasing trend in annual rainfall over Mauritius.

Source: Meteorological Services, Mauritius



## Duration of dry months

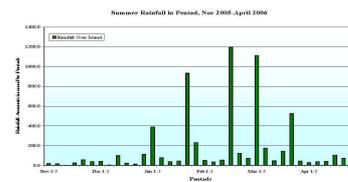


The duration of the intermediate dry months, the transition period between winter and summer, is becoming longer.

Photo: <http://www.valley-ae.com>



## Rainy days and rainfall intensity



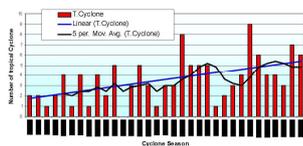
The number of rainy days has decreased but the frequency of heavy rainfall events has increased.

While in the old days, most of the summer rains resulted from cyclones, since the past five or so years summer rains have been harvested outside cyclones.

Source: Meteorological Services, Mauritius



## Tropical cyclones



Analysis of data from Mauritius Meteorological Services does not show any increase in the number of storms in the South West Indian Ocean basin (SWIO).

However, decadal plot of the number of storm formations over the last 32 years (1975- 2008) clearly shows the increasing trend in the number of intense cyclone (winds above 165 km/hr).

Source: Meteorological Services, Mauritius



## Recent climate trends UNDP Climate Change Country Profile

### Temperature

- Mean annual temperature has increased by 0.6°C since 1960, an average rate of 0.13°C per decade.
- This increase in temperature is most rapid in JFM (0.16°C per decade) and least rapid in OND (0.10°C per decade).
- There is insufficient daily temperature data available from which to determine trends in daily temperature extremes.

Source: McSweeney et al. UNDP Climate Change Country Profile



## Recent climate trends UNDP Climate Change Country Profile

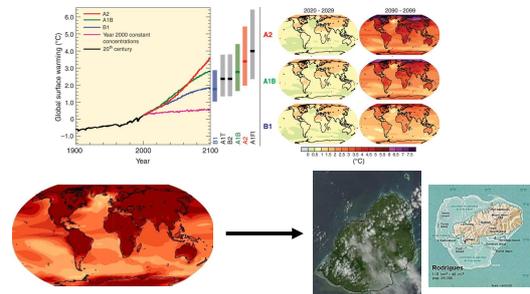
### Precipitation

- The large inter-annual and inter-decadal variations in rainfall in this part of the world mean that it is difficult to identify long term trends. Whilst there is no evident trend in annual rainfall, OND rainfall has declined over the period 1960 to 2006, at an average rate of 7.7mm per month (8.7% per decade).
- There are insufficient daily rainfall observations available to identify trends in daily rainfall extremes.

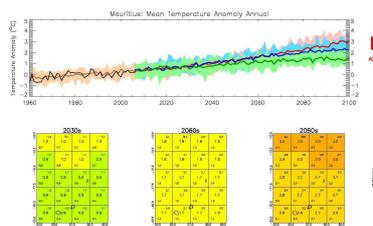
Source: McSweeney et al. UNDP Climate Change Country Profile



## Projected changes



## Projected temperature changes

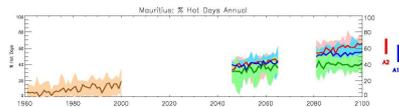


- The mean annual temperature is projected to increase by 1.0 to 2.0°C by the 2060s, and 1.1 to 3.4°C by the 2090s.
- The range of projections by the 2090s under any one emissions scenario is 1.0-1.5°C.

Source: McSweeney et al. UNDP Climate Change Country Profile



## Projected changes in 'hot' days



- All projections indicate substantial increases in the frequency of days and nights that are considered 'hot' in current climate.
- Annually, projections indicate that 'hot' days will occur on 29-48% of days by the 2060s, and 33-71% of days by the 2090s. Days considered 'hot' by current climate standards for their season are projected to occur on 100% of days in JFM and JAS by the 2090s.

Source: McSweeney et al. UNDP Climate Change Country Profile



## Projected rainfall changes

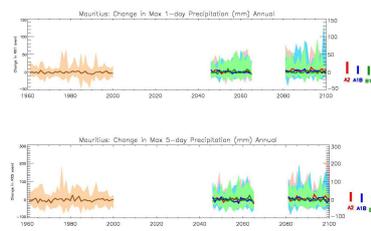


The range of projections in mean annual rainfall from different models is large and straddles both negative and positive changes (-20% to +24%), with ensemble median changes close to zero.

Source: McSweeney et al. UNDP Climate Change Country Profile



## Projected changes in rainfall extremes



- The projections of change in the proportion of rainfall that falls in heavy events range between both increases and decreases.
- The models are broadly consistent in indicating overall increases in 1- and 5-day rainfall maxima by the 2090s.

Source: McSweeney et al. UNDP Climate Change Country Profile



## Projected changes in tropical cyclones

- Tropical cyclones are poorly captured by GCMs and thus potential changes in intensity and tracks of tropical cyclones in the future are very uncertain.
- The uncertainty in potential changes in tropical cyclones contributes to uncertainties in future wet-season rainfall.

Source: McSweeney et al. UNDP Climate Change Country Profile



## Projected sea-level rise

- Sea level in this region is projected by climate models to rise by the following levels by the 2090s, relative to 1980-1999 sea level:
  - 0.13 to 0.43m under SRES B1
  - 0.16 to 0.53m under SRES A1B
  - 0.18 to 0.56m under SRES A2

Source: McSweeney et al. UNDP Climate Change Country Profile



## Projected sea-level rise caveat

- The possibility of a sea level rise of up to 1m, or possibly even more, by 2100 cannot be excluded based on current evidence
- This is due to continued uncertainty regarding the West Antarctic and Greenland ice sheets



## Climate changes – summary

- More frequent heat waves in summer
- Milder winters
- Uncertain changes in average rainfall
- The possibility of increased frequency of heavy precipitation events
- The possibility of increased duration of dry spell
- Uncertainty regarding changes with tropical cyclones
- Storm surges, flooding and inundation as a result of sea-level rise

