Photo courtesy of Derek Gosling

Adaptation responses:
what communities can do

Regional adaptation needs to be focused on local partnerships and individual and collective actions aimed at building region-wide resilience.

Environment Bay of Plenty already does a lot of relevant work, for example through its holistic team approach to pest management, biodiversity protection and enhancement, and land management. Community care groups are a very positive way to get people involved in positive actions.

Crisis management
or change management?

Lasting and effective change doesn't come about from crisis. It comes from individuals and communities developing positive visions for the future and making them happen. As many people as possible need to be engaged in change management. Environment Bay of Plenty and the Bay of Plenty community are well placed to develop a positive and proactive approach to adaptation.

Some key adaptation
actions & interactions:

Education and communication are paramount.

Everyone needs to be aware of, and take responsibility for, the biosecurity challenges of both present and future. Be informed about pest threats and seek advice and information on both suitable and unsuitable plants for your patch.

Support efforts that are focused on ecological restoration, particularly of waterways, roadsides, and small remnants of bush.

Be aware of the value that farming and horticulture bring to the region. Support farmers and orchardists to deal with the challenges that they are facing.

There needs to be serious discussion in the community about the on-going costs of drainage in low-lying coastal areas against the need to consider establishment of wetland buffer zones.

Everyone needs to work together for mutual benefit.

This brochure has been prepared for Environment Bay of Plenty by Dr Gavin Kenny of Earthwise Consulting Limited. It is a summary of a more comprehensive report on 'Biotic effects of climate change in the Bay of Plenty'.

For a copy of the full report contact Environment Bay of Plenty:
Telephone: 0800 ENV BOP (368 267)
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For more information on climate change:
In the Bay of Plenty region, go to www.envbop.govt.nz and click on 'Climate change', or phone or email Environment Bay of Plenty using the contacts above.

In New Zealand, go to www.climatechange.govt.nz and www.niwa.co.nz/ncc/clivar

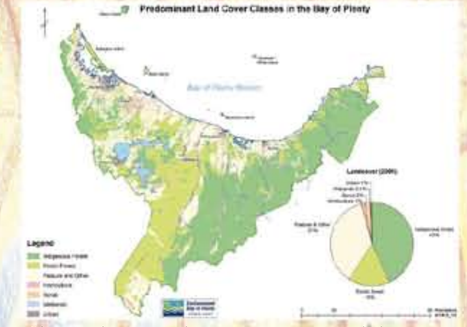
For information on 'Adapting to climate change in eastern NZ' go to www.earthlimited.org

Climate change
in the Bay of Plenty

What might happen to pest plants and animals, native plants and our farms and orchards?

What sort of responses might be required?

The Bay of Plenty is a biological melting pot. Many ingredients have been mixed in and new ones are being introduced all the time. It is a dynamic, interactive and changing mix.



Climate change can be seen as a warming of this pot.

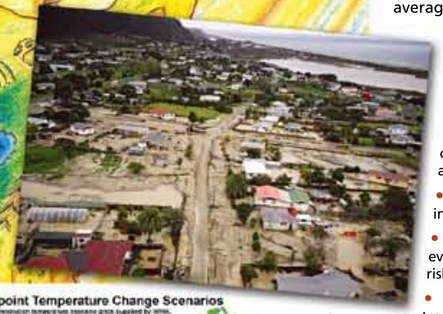
What is climate change?

Climate change has taken place over thousands and millions of years but there is now an influence on climate from a rapidly increasing world population and its use of resources. In a few generations humankind is exhausting fossil fuel reserves that were generated over several hundred million years. More greenhouse gases such as carbon dioxide in the atmosphere are enhancing the natural greenhouse effect. The result of the enhanced greenhouse effect is called "anthropogenic climate change", or climate change that is a result of human activity.

What will climate change mean for New Zealand and the Bay of Plenty?

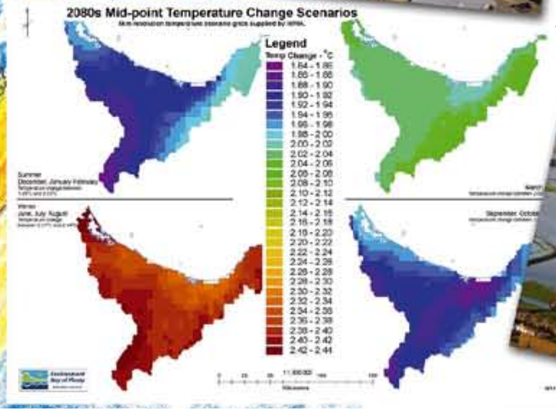
Climate change is likely to bring wetter average conditions in the west of New Zealand and drier average conditions in the east. By 2050 temperatures could be up to 1˚C higher on average in the east and possibly 10 percent drier on average. These small shifts in temperature and rainfall could lead to significant changes in the frequency of extreme weather events. The result could be increased drought and flood risk.

In the Bay of Plenty temperatures could increase on average by 0.5˚C to 3.8˚C over the next 70 to 100 years. Rainfall changes are uncertain but there could be drier average conditions, particularly in coastal areas.



Changes in climate that might happen in the Bay of Plenty include:

- Warmer winters, reduced frequency of frost inland and at higher elevations, and a longer growing season.
- Drier average conditions will lead to increased drought risk.
- More frequent and intense rainfall events could take place, with an increased risk of flooding and erosion.
- It isn't clear if there could be more tropical cyclones and periods of intensive storminess, but it is possible that this could happen.



What might happen to pest plants and animals, native plants and our farms and orchards?

Native forests have been cleared, exotic plants and animals introduced, wetlands drained, rivers contained and urban settlements and the infrastructure of a modern economy have been developed.

The current biological melting pot is dynamic and rapidly changing. Climate change, along with other changes that are happening, could lead to even more rapid change than has happened over the last 100 years.

Some key biological changes could include:

Biosecurity effects

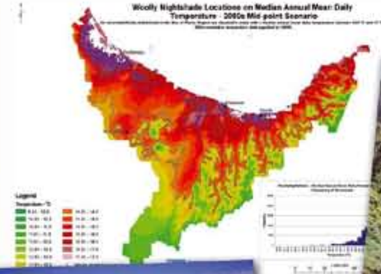
- Wider establishment and spread of new and existing pest plants.
- Greater abundance of existing animal pests.
- Greater survival of a range of insect pests.

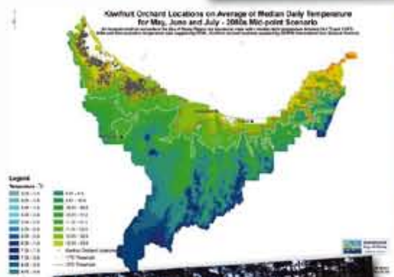
Indigenous biodiversity effects

- Shifts in suitable climate zones for species and communities.
- Strong impacts from increased weather extremes, particularly in areas already stressed such as smaller remnants of native vegetation.
- Changes to ecosystem productivity.
- Disruption to both coastal and fresh water ecosystems.

Agriculture and horticulture effects

- Direct and indirect changes to economic land uses through effects on water quality, drought risk, flood risk, and water availability.
- Southward spread of kikuyu and other subtropical grass species.
- Hayward kiwifruit production could become uneconomic in warmer parts of the region with a shift towards cooler, inland sites.
- A range of other changes to agriculture and horticulture including changes in pests and diseases, effects on animal health, impacts on nutrient cycling, increased rural fire risk, and effects from sea-level rise in low-lying areas.





Three case studies

The biological ingredients are different in different parts of the Bay of Plenty. These are influenced by climate, soils, topography, past and present land use, and urban development.

Climate change will have different effects around the region.

Effects in the Tauranga Harbour Catchment

Climate change, in combination with on-going pressures from urban expansion and land use change, will lead increasingly to a biosecurity situation comparable to Auckland and Northland.

Warmer temperatures and sea-level rise will affect coastal vegetation, with the possibility of increased growth and spread of mangroves and favourable conditions for wetland ecosystems.

Pressures on bush margins from invasive weeds are likely to increase.

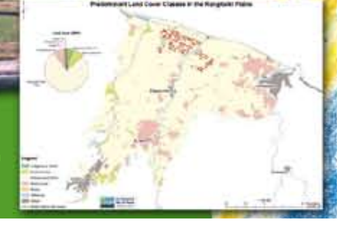
There will be on-going changes in agriculture and horticulture, with an increasingly subtropical environment in coastal areas.

Effects on the Rotorua Lakes

There will be changes to both land and freshwater ecosystems.

Subtropical weeds, such as woolly nightshade, could become more prevalent.

Changes in temperature and rainfall patterns will have both direct and indirect effects on lake ecosystems.



Effects on the Rangitaiki Plains

Coastal areas that are already below sea level will be at increased risk from both river flooding and sea-level rise.