

## CHAPTER 13

### PRIORITIES FOR FUTURE RESEARCH

#### Introduction

The following areas have been highlighted for further research:

#### Climate Science

Undertake further research in order to improve the quality of climate scenarios data.

1. Specifically with regard to extreme events and probability, and particularly with regard to coastal storms. It is recognised that this is a difficult area for climate science but this is an aspect of the data that is important to many domains.
2. Make the data currently published on the UKCIP website available in a more user-friendly format for use at a sub-regional scale.

Both of the above may form part of both national and regional studies.

#### Natural Environment Domains

##### Vulnerable locations

Further monitoring and assessment is required of the impact of climate change on vulnerable locations within the region, such as Dartmoor, Isles of Scilly and the Somerset Levels.

##### Agriculture

Research into opportunities for new food and non-food crops, water management and diversification as climate change may result in the loss of the region's competitive advantage in a variety of locations and for a variety of crops.

Further research to produce an authoritative, comprehensive and detailed study on climate change and agriculture in the South West in order to identify key issues and recommendations.

##### Biodiversity

Investigate further the effects of climate change on habitats and species in the region, including:

1. contemporary monitoring;
2. computer modelling;
3. analysis of long-term biological records.

#### Coastal Issues

Monitor the erosion of coasts and beaches, and examine further the vulnerability of coastal defences.

Research into the movement of sand and shingle to ensure the maintenance of beaches.

Assess the risk of re-mobilisation of toxic substances in riverine/estuarine sediments.

Research within the coastal zone to assess the impact of climate change upon transport infrastructure eg rail network.

#### Forestry

Research the impacts of climate change for forestry and woodland ecosystems.

#### Marine Fisheries

Investigate the shifting geographic ranges of fish species based upon an understanding of thermal boundaries for fish species.

Maintain, develop and utilize existing databases (e.g. ERICA, operated out of the Cornwall Wildlife Trust) providing long-term data on marine fisheries.

Create a baseline mapping of stocks and species of marine fisheries presently found in the region.

Undertake continuous monitoring and the upkeep of databases to identify changes in fish species and stocks as well as to monitor temperature changes in the marine environment.

#### Rivers and Flooding

Research is still required into how aspects of water quality will change with global warming and for assessing the ecological impacts of those changes in rivers and other freshwater ecosystems.

Prepare detailed baseline information on the quality of rivers in the South West on which to base future predictions of climate change impacts, using available models.

Prepare accessible future-based information on the impacts of flooding and low-flow at a regional scale.

Investigate the impacts of climate change on other catchment processes such as soil erosion, sediment mobilisation and yield and land slipping.

Assess the risk of re-mobilisation of toxic substances in riverine and estuarine sediments.

Identify locations of drainage infrastructure which will be particularly vulnerable to flash flooding.

Develop further understanding of potential applications of Sustainable Urban Drainage Systems (SUDS).

## Water Resources

Investigate further the potential changes in demand for quality and quantity of water.

Investigate the potential for more efficient use of piped water through the use of alternative sources of water, such as grey water, in domestic and other applications.

## Society and Lifestyle Domains

### General

Track possible lifestyle changes and their wider implications, especially for the socially excluded.

### Built Environment

Undertake action research in the construction sector to develop sustainable design strategies (and products) to respond to the anticipated climatic conditions, particularly in response to increased summer temperatures.

Develop regional or sub-regional climate scenarios to be used for modelling, for example thermal performance as part of a decision making and design process, as in the BRE tools for determining insulation, glazing etc. Such work informing building design and construction at a sub-regional level can achieve a local distinctiveness.

### Health

Investigate the thresholds for heat related deaths and illness, and the vulnerability of particular localities.

Investigate the role of temperature in food and water-borne disease transmission.

Investigate the uncertainties which currently exist on such matters as:

- How fast will people acclimatise to the warmer climate?
- How great is the risk of introduction of "new" diseases?
- How will adaptation measures in other sectors affect health, for example, increased use of insecticides in agriculture or home gardening?

Increase knowledge and understanding of the implications of climate change and appropriate changes in lifestyles to enhance good health.

The biggest challenge and easiest way to protect and improve the health of those living in the region is to increase awareness of issues and responses.

Many health risks relating to climate change will be avoidable if appropriate changes in behaviour are encouraged.

## Heritage

Establish vulnerability of specific heritage landscapes and determine policy for defence or retreat, in conjunction with landlords and tenants.

Establish vulnerability of specific heritage buildings and determine policy for management, in conjunction with landlords and tenants.

Confirm anecdotal evidence that environmental stratigraphy may be disrupted as a consequence of increased seasonal waterlogging.

### Housing

Investigate potential issues of fuel poverty related to the need for summer cooling, and link to current issues of fuel poverty for winter heating.

Undertake action research to develop appropriate strategies for responding to changing climate in each of the different modes of housing tenure (eg. private rented, social housing, owner-occupied).

### Transport

Identify more accurately the specific locations within the region where transport infrastructure is vulnerable to flooding; landslips; tidal surges; etc.

### Utilities

Undertake further research into the impacts of changing climate on each of the renewable energy technologies, as the greater use of renewable energy will both reduce greenhouse gas emissions and sustain economic growth. There are opportunities to build on existing regional strengths including wind, tidal, biomass and earth energy systems.

Undertake specific regional research into the impacts of changing climate on offshore renewable energy sources (eg wind, wave, tide) and reassess the environmental and economic effects of the Severn Barrage.

## Business Domains

### General

Research is required within all major sectors as although many impacts are generic (eg buildings) others are sector specific and require detailed understanding of the different goods, services, markets, processes, etc.

Continuous monitoring of key determinants of environmental quality is essential to monitor change in the region and encourage proactive industry responses.

## **Tourism**

Further work is required, In conjunction with trade associations etc, to assess the impact of the climate on existing and future tourism provision, as tourism plays a significant role in the South West Region and much of its business is weather sensitive.

Specifically, identify the scope for extending the tourist season, and therefore enhancing the regional economy, as a response to predicted climate change in the region, and recommend appropriate courses of action for relevant agencies.

## **Local Authority Domains**

Action research to assist local authorities to develop detailed adaptation responses across the wide range of activities for which they are responsible and which are vulnerable to climate change. Some of this work may be undertaken at a regional level, but it is probably more appropriate to work at a sub-regional scale, in clusters or partnerships of local authorities.

Investigate the ways in which traditional land-use planning will need to change to accommodate climate change and sustainability issues.

Action research to identify the appropriate strategic frameworks in which to nest adaptation strategies.

Action research to explore how climate change might be further incorporated into emergency planning systems.

## **Others**

Further work at Regional, Sub-Regional and Local levels to encourage integrated planning in response to climate change adaptation.

Investigate the effectiveness and further potential of initiatives such as the Dorset Coastal Forum, Local Strategic Partnerships, Strategic Coastal Plans as appropriate partnerships and inter-agency co-operation in addressing cross-sectoral issues.

Investigate the most effective means of increasing awareness of climate change adaptation issues, both within organisations and amongst individuals across the region.

In particular seek to understand why it might be (as the Scoping Study suggests) that individuals do have some general understanding of climate change impacts and potential adaptation responses, but that this understanding is not applied within organisations.