Environment Agency

a better place

State of the Environment in the South West 2005

We are the Environment Agency. It's our job to look after your environment and make it a better place – for you, and for future generations.

Your environment is the air you breathe, the water you drink and the ground you walk on. Working with business, Government and society as a whole, we are making your environment cleaner and healthier.

The Environment Agency. Out there, making your environment a better place.

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Foreword

One of our primary roles is to ensure that everyone has a clearer picture of our environment. This report is a major contribution to achieving this.

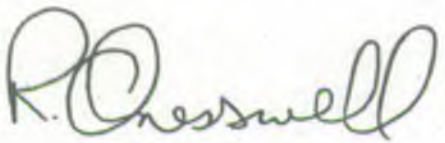
I am pleased to report that much of the region's environment is in good health and we are working constantly towards this goal. However, it is a vulnerable environment and there are concerns over certain issues we need to progress. These include flooding, soil run-off caused by poor land management and what to do with our growing waste problem. Other pressures include a rising population, the reality of climate changes already underway, and the push for ever greater economic development.

This report concentrates on Environment Agency activities and concerns. A follow-up report with regional partners, due later in 2005, will broaden these horizons across the whole environmental sector.

We cannot protect the environment alone. Indeed, none of us are alone when protecting, caring for and improving the region's environment. We recognise the work of other organisations and by joining forces more progress is possible.

There is much to be enjoyed, appreciated and recognised in our region's environment. It is our main asset and is recognised as such by the many thousands who come here to visit, holiday, work or live.

I hope that you find this report useful. Please let us have your feedback on its contents.



Richard Cresswell
Regional Director

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Introduction

The subjects covered in this report come from the Environment Agency's vision for a rich, healthy and diverse environment for present and future generations. It looks at progress and action relating to the nine environmental themes identified in 'Making it Happen', our Corporate Strategy. These are linked to our priorities for 2002–2007.

Each of the subjects covered in this report has been summarised to show briefly what the current regional state/position is and where any trends are known.

More information about the local environment (including flood maps, river water quality, bathing waters and waste) is available in the Environment Agency's What's In Your Backyard at http://www.environment-agency.gov.uk/maps

Information on the state of the environment within the wider Government Office South West boundary can be found at http://www.swenvo.org.uk. This website contains information on a wider range of environmental issues than those directly in the Environment Agency's remit, including health and the economy. This content will be revised later in 2005 and will focus on the Regional Environment Strategy in terms of monitoring its targets, aims, aspirations and indicators.

Summary

A better quality of life

- The South West's population has increased by over 5% since 1992, a rate that is 1.6 times faster than that for England as a whole.
- According to the 2004 Index of Multiple Deprivation, there are 95 census-based 'Super Output Areas' in the South West that are ranked within the most deprived 10% in England. Integrated Pollution Sites (IPC) are disproportionately clustered together in these deprived wards.
- Local quality of life in the region is the highest of any English region.
- 441,913 fly-tipping incidents were reported by local authorities in the South West in the six months prior to November 2003 3% of the national total.
- Climate change will impact on our quality of life in the future. Incidents of malignant melanoma are likely to increase as summer and autumn cloud cover reduces and exposure to radiation increases.
- There is an increasing awareness of the role played by recreational angling in the health of the population. Around 123,000 freshwater rod licence were sold in the South West in 2003-2004, while 25,000 local people go sea angling, along with 750,000 visitor days spent sea angling.

An enhanced environment for wildlife

- Salmon stocks are under serious threat with 16 of our 20 salmon rivers failing to meet their Conservation Limit. However, 2004 showed a slight upturn in the number of salmon caught by rod anglers across the region.

- Stocks of coarse fish are generally healthy in the South West.
- Eel populations are following the national and European trend of a steep decline.
- The Fourth Otter Survey of England between 2000 and 2002 revealed that sites showing positive signs of otters increased by 83% in Devon and Cornwall and by 121% in Wessex on 1991–1994 survey findings.
- Water voles have declined dramatically across the South West, with 87% of known sites lost in Devon and Cornwall and 49% lost in the Wessex region between 1990 and 1998. However, the most recent survey carried out in Dorset reveal a 4.7% increase in positive occupation and almost a 50% total number of positive sites, which is only 3.5% short of the 2010 target.

Cleaner air for everyone

- Air quality in the South West is generally good, with low levels of sulphur dioxide, nitrogen dioxide and particulates compared to the rest of England.
- Although it is not feasible to show definitive trends since the early 1990s, the number of days when air pollution was moderate or higher rose significantly in both rural and urban areas in the South West in 2003, predominantly due however to the hot summer experienced in this year.
- New release limits have been imposed by the Environment Agency on an industry that it regulates in Bridgwater (Somerset), which can cause poor air quality during certain weather conditions in the summer. These new limits will ensure compliance with the air quality objective for 15-minute mean sulphur dioxide concentration from 2006

Limiting and adapting to climate change

- Eight out of the warmest years in the South West have occurred since 1990. 1990 the warmest decade in the region, followed by the 1980s and the 1970s.
- Future seasons in the region will be warmer and drier in the summer whilst winters will be milder and wetter.
- Sea level measurements recorded in Newlyn (Cornwall) reveals a rise of around 200mm since 1916.
- The South West has the lowest emissions of carbon dioxide, sulphur dioxide, nitrogen oxide and particulates (PM10) from regulated industry of any Environment Agency region.

Improved and protected inland and coastal waters

- Water quality in the South West's bathing waters, rivers, estuaries and shellfish waters is generally good.
- River flows in South West rivers are generally good, but the abstraction of water has had an unacceptable environmental impact by reducing river flows on the Rivers Wylye and Avon at Malmesbury (Wiltshire), Piddle (Dorset), Tavy and Taw (Devon).
- Setting of illegal surface gillnets for sea fish is causing problems for the bycatch of salmon and sea trout stocks, as well as seabirds and porpoises and dolphins.

Restored, protected land with healthier soils

- Between 1995 and 2003 the total area of land under agriculture in the South West remained relatively stable, however, the number of agricultural holdings increased by 14%.
- The number of very small farm holdings (of 5 hectares or less) increased by 72% between 1995 and 2003 (compared to almost 65% in England).
- 81% of sites surveyed for cultivated land on silt and fine sandstone landscapes in the South West have severely or highly degraded soil structure.

Reducing flood risk

- In the South West region, recent Environment Agency expenditure in flood risk management has been around £40million. 2005-2006 has seen an increase of approximately £15million reflecting the increasing threat of severe weather events from climate change.
- There are 900km of flood defences and approximately 4,500 individual structures protecting urban areas. Of these flood defences, 56% are in good condition or better and 5% are in poor condition or worse. Of the structures, 68% are in good condition or better and 6% are in poor condition or worse.
- Climate change scenarios predict that winters will be 5 to 15% wetter and

that heavy rainfall will be more common by 2050. There will be higher tides as a result of the predicted rise in sea level. Some locations in the South West will be more vulnerable to coastal flooding. Tidal damage alone will increase by a factor of six over the next 70 years if we do not adapt to rising sea levels.

- The number of planning applications where the Environment Agency objected on flood risk grounds increased slightly from 1,274 to 1,354 between 2003 and 2004 compared to the previous year, although this may be partly explained by changes to the reporting boundary.

Wiser, sustainable use of natural resources

- Almost 2.88 million tonnes of municipal waste were produced in the South West during 2003–2004.
- Regional household waste increased by almost 5% between 2001–2002 and 2003–2004. Household waste is increasing beyond the region's population growth.
- Landfill is still the dominant form of management for municipal waste in the region, accounting for 75% in 2003–2004. However, there are signs that this reliance is slowly starting to reduce (by 6% between 2001–2002 and 2003–2004).
- Climate change will place a greater strain on the region's water resources over the coming century.

- Average monthly flows recorded at most of the gauging stations in South West rivers were below the long-term average in January 2005, largely due to the relatively low annual rainfall.

A 'greener' business world

- There were 3,538 substantiated pollution incidents in the South West during 2004, a reduction of over 30% since 2000. However, the number of Category 1 incidents (the most serious) increased from 3 in 2003 to 11 in 2004.
- Category 2 incidents (significant) have been steadily declining since 2001 and reduced by 29% between 2001 and 2004.
- The total number of Category 3 (minor) pollution events in the South West was 1,609, the second highest in the country. However this is a reduction of 11% compared to 2003 and a 26% reduction since 2001.
- Category 1–3 incidents from agricultural sources reduced by 8% for the third consecutive year, however 3 Category 1 incidents were recorded in 2004.

A better quality of life

Long-term vision

People will have peace of mind knowing that they live in a clean, healthy environment – one they can enjoy to the full yet feel motivated to care for.

People's quality of life is fundamentally dependent upon the quality of the environment in which they live. All of our work contributes to a better quality of life for people living in, working in and visiting the region.

A healthy environment is critical for everyone living, working and visiting the South West. Every community is affected by environmental quality and people feel strongly about the quality of our cities, towns and villages in which they live. The South West has the best local environmental quality of all English regions.

Current trends

Population and development

- The South West's population, estimated at 4.9 million in 2002, has increased by 5.18 % since 1992. This rate of growth is 1.6 times faster than that for England as a whole (which was 3.25%). Only the cities of Bristol and Plymouth showed declines of 4.8% and 6.2% respectively.
- Between 1992 and 2002, all of the region's local authority areas recorded population increases, with the largest recorded rise of over 10% in North Wiltshire and West Wiltshire. The lowest increases were in the Isles of Scilly and Purbeck.
- Population density is highest in Bournemouth Unitary Authority with 3,547 people per sq km, and lowest in the predominantly rural local authority district of West Devon, with only 44 people per sq km.
- By 1998, the percentage growth in housing built was greater in the South West than any other region. It is estimated that 470,000 new houses need to be built between 1998 and 2021 – the equivalent of 10 cities the size of Exeter or over 20,000 houses per year every year in that period. This rate of build is not currently being achieved.
- Our growing population is creating greater pressure on water resources. Although demand has remained fairly stable since 2000 in the region, it is predicted to rise by around 5% over the next 20 years.

Deprivation

- Indicators of deprivation include low income, unemployment, poor health, access to education, poor housing and access to services. It can also be closely related to environmental quality and poor environmental conditions, including litter, vandalism, fly-tipping and the loss of

safe play areas or footpaths.

- According to the 2004 Index of Multiple Deprivation, there were 95 census-based 'Super Output Areas' (SOAs) in the South West which ranked within the most deprived 10% in England (there were 32,482 SOAs in the whole of England). About 142,000 people live in these 95 SOAs, equivalent to 2.8% of the total population.
- Research published by the Environment Agency on environmental quality and social deprivation in England and Wales reveals:
  - There are eight times more people from deprived areas living within the tidal floodplain
  - In fluvial floodplains, those most affected are least likely to be in a deprived area
  - There is strong evidence of a socially unequal distribution of Integrated Pollution Control (IPC) sites and associated potential impacts. There are five times as many IPC sites and authorisations in the most deprived decile wards, there are also seven times as many emission sources as wards in the least deprived decile.
  - Out of the 3.6 million estimated people living within 1km of an IPC site nationally, there are 6 times more people from the most deprived decile compared to the least deprived decile. IPC sites are also disproportionately clustered together in deprived wards. Analysis of emission levels from IPC sites for particulates and carcinogenic emissions to air, shows a disproportionate concentration of emissions in more deprived areas.
- Bristol has 35 of the 95 most deprived SOAs in the region, followed by Plymouth (19), Swindon (7),

Weston-Super-Mare (5), Bournemouth (6) and Gloucester (5) also show concentrations of urban deprivation. These deprived urban SOAs contain about 132,000 people or 2.7% of the region's population.

Local quality of life

- Results of the 2003 Quality of Life Survey by ENCAMS show that the South West has the highest local quality of life of any English region. However, satisfactory standards are yet to be achieved in litter, detritus, highway condition, maintenance of litter bins, street furniture and the overall maintenance of landscaping.
- In the six months prior to November 2004, just 3% (13,081) of the 441,913 fly-tipping incidents reported by local authorities in England took place in the South West. Of these incidents, the majority (almost 64%) were reports of dumped waste along highways, almost half of which originated from households.
- Overall, the people of the South West are generally healthy, with the highest life expectancy in England for women and the second highest for men. The widening gap in life expectancy between professionals and manual workers is a cause for concern. Variations in health are also evident and are primarily a result of lifestyle differences, which are highly correlated with deprivation.
- Malignant melanoma – an aggressive skin cancer – is also a particular problem in the South West recording the highest incidence in England. Incidences of this cancer are likely to rise over time due to climate change as summer and autumn cloud cover reduces and exposure to radiation increases.

An enhanced environment for wildlife

Long-term vision

Wildlife will thrive in urban and rural areas. Habitats will be improved and extended for the benefit of all species. Everyone will understand the importance of safeguarding biodiversity and protecting wildlife.

The UK's biodiversity is in need of protection. To complement the range of UK nature conservation legislation, the UK Biodiversity Action Plan (UK BAP) was published in 1994. It aims to conserve and enhance biological diversity by identifying the actions required to achieve sometimes challenging targets and objectives for 391 species and 45 habitats. We are responsible for the water and wetland elements of the UK BAP.

The regional biodiversity picture is complex. Some of the elements are reported on here to give an overview of trends.

The South West supports some of the UK's rarest and most endangered habitats including:

- Lowland heathland – 25% of the UK total – e.g. Dorset heathlands
- Rhos (marshy) grassland – 13% of the UK total – e.g. Culm grasslands of Devon and Cornwall
- Saline lagoons – 37% of the UK total – e.g. The Fleet (Dorset) is the largest brackish lagoon in England
- Chalk rivers, such as the Hampshire Avon
- Offshore reefs – e.g. those off south and east Devon are among the best in the country.

Current trends

- Salmon are a significant resource in 20 rivers in the South West. 16 of those rivers are failing to meet their conservation limit, indicating that there are insufficient salmon spawning to be able to populate the rivers to their maximum capacity. There is a long-term national trend showing a decline in salmon catches. However, in 2004, the number of salmon caught by anglers across the South West showed a slight upturn, in line with many other rivers in the country.
- Eels are found throughout the rivers and watercourses of the region. There is some commercial fishing for the adult silver or yellow eels, but the biggest commercial fishery is for the young eels called elvers. The rivers of the Severn estuary generally support a large seasonal fishery for elvers, with fishing concentrated around the lower tidal River Parrett to the north east of the region. The numbers of eels across Europe (including Britain) appear to have declined in the last 30 years. Local data is sparse and any trends difficult to detect. As the eel is part of a pan-European population, any action needs to be concerted and taken internationally. A national review of eel licensing and byelaws was conducted in 2000, resulting in new byelaws to protect the remaining stock.
- The Fourth Otter Survey of England between 2000 and 2002 surveyed a total of 399 sites in Devon and Cornwall – 83% of which showed positive signs of otters, an increase of 24% since the last survey in 1991 – 1994. The eastward expansion of otters from Devon and Cornwall appears to be continuing, and otters are now widely but sparsely distributed across the rest of the South West Region (Wessex) – signs

of which were found in 40% of the 172 sites surveyed (a 121% increase on 1991–1994).

- Figures for both the Devon and Cornwall and the Wessex area are above the national figure of 34% - confirming the South West as the stronghold of otters in England. High otter population in the region is due to a number of reasons, including high water quality and low disturbance (being the most rural of the English regions with a relatively low population).
- Otter road kills are probably the greatest issue for otter conservation in Devon and Cornwall, as road kills are particularly high on the Somerset and Devon border. Measures to eliminate the risks at the worst road crossings are being carried out by the Environment Agency and the Highways Agency.

- 47% of all bird species in the South West showed population increases between 1994 and 2002. Lapwing however, an example of a wetland bird, continued to experience major declines – by 71%.
- Water voles have declined dramatically across the South West, with 87% of known sites lost in Devon and Cornwall in just eight years (1990–1998). In the Wessex region 49% of known sites were lost. The most recent survey was carried out during 2001–2002 in Dorset, the results of which confirm a 4.7% increase in positive occupation since the last survey. The total number of positive sites in Dorset has reached 40.9%, which is only 3.5% short of the 2010 target. Overall good progress is being made towards the National Biodiversity target (to restore populations to their former widespread distribution, using the 1989–1990 survey results as a baseline), as populations on the Frome catchment exceeded the target six years ago and continue to grow. The River Frome is now considered one of the best rivers for water voles in the country.
- Almost a fifth of England's Sites of Special Scientific Interest (SSSIs) are in the South West. In April 2005, 52.69% of all SSSIs were in favourable condition, 22.9% were unfavourable but recovering, 16.46% unfavourable with no change, 7.84% unfavourable but declining and 0.12% destroyed or partly destroyed. These results reveal a significant improvement in the area of SSSI in favourable condition (44% in 2002).

Cleaner air for everyone

Long-term vision

People will enjoy cleaner and healthier air. The emission of pollutants into the atmosphere will decline greatly, below the level at which they can do significant harm.

Air is one of the essential natural resources on which all life depends. However, our atmosphere is also in the front line for receiving environmental pollution – some natural (such as volcanic dust), but there are also significant man-made sources (such as from the manufacturing industry, the burning of fuels for energy, electricity, heat and transport).

This man-made pollution affects air quality and potentially impacts on climate change.

To ensure the protection of human health, the region's air quality needs to be improved to meet national air quality objectives for carbon monoxide, lead, nitrogen dioxide, particulates, sulphur dioxide, benzene and 1-3 butadiene.

Air quality in the South West is generally good with low levels of sulphur dioxide, nitrogen dioxide and particulates compared to the rest of England. However, pockets of poor air quality exist in the region, especially within large urban areas associated with heavy traffic loads.

Current trends

- In the last few years, 14 air quality management areas, primarily urban, have been established by local authorities in the region to monitor and reduce air pollution. Traffic is the main source of air pollution in these areas.
- We have taken action to impose new release limits on an industry that we regulate in Bridgwater (Somerset). This industry can cause poor air quality during certain weather conditions in the summer and may not achieve the air quality objective for 15-minute mean sulphur dioxide concentration by the 31 December 2005. These new release limits will apply from 2006 to ensure compliance with the objective.
- The closure of the zinc smelter in Avonmouth in 2003 and the closure of one of the lines at the carbon black plant has resulted in a reduction in the sulphur dioxide to levels considerably below air quality objectives.
- Nationally, there was an average of 22 days with moderate or higher pollution in urban areas, and 41 days in rural areas in 2004. Urban air quality has generally improved significantly since 1993, while rural air pollution, caused largely by ozone, has shown no overall trend.
- In the South West, air quality is monitored at representative sites chosen by the Department for Environment, Food and Rural Affairs Defra). Although it is not feasible to show definitive trends since the early 1990s, the number of days when air pollution was moderate or higher rose significantly in both urban and rural areas in 2003, as can be seen in

the table. Such short-term trends, however, can be masked by variation caused by the weather. The hot summer in 2003 led to an unusually high number of pollution days in most regions.

		Site type	2002	2003
South West	Bristol centre	urban	12	48
	Plymouth centre (Devon)	urban	7	35
	Somerton (Somerset)	rural	29	68
	Yarner Wood (Devon)	rural	26	75
England		urban	19	51
		rural	34	58

See also Limiting and adapting to climate change

Limiting and adapting to climate change

Long-term vision

Society as a whole takes into account and prepares for the probable changes to our climate. Deep cuts are made in the emission of greenhouse gases, such as carbon dioxide.

Although the UK is on line for meeting targets set by the Kyoto agreement by 2008–2012 (12.5% below 1990 levels), it is currently unlikely that it will meet its own domestically set target of 20% below 1990 levels by 2010.

Despite making carbon dioxide cuts we still need to adapt to the changes in the climate system that are unavoidable, due to past emissions.

Current trends

- Records indicate that the world is warming. The UK Climate Impacts Programme in 2002 identified that global temperature has risen by about 0.6°C since the beginning of the 20th century, with about 0.4°C of this warming occurring since the 1970s.
- Nationally, 1998 and 2002 were the two warmest years ever recorded. In England and Scotland, 2003 was the sunniest year on record and the second driest year since 1766. Mean temperatures in January 2005 were also the warmest since 1990.
- In the South West, Meteorological Office records for Exmouth (Devon) exist back to 1855, which show that 8 of the warmest years have occurred since 1990, although 1989 remains the warmest year to date. Moreover, the warmest decade was the 1990s followed by the 1980s and 1970s.
- Future seasons will be warmer and drier in summer and autumn whilst winters will be milder and wetter.
- In terms of rainfall and sunshine, Met Office records show that 2003 was the fourth driest and the fourth sunniest in series for the South West.
- UK climate change scenarios indicate that global sea level will rise between 90mm and 690mm by 2080, primarily as a result of thermal expansion of the oceans, with a secondary but significant input from glacial melt water.
- In the South West, rises in sea levels could have a major impact upon communities in coastal and estuarine areas. Sea level measurements recorded in Newlyn (Cornwall) show a rise of about 200mm since 1916 (from 6,974 to 7,174mm).
- It was estimated that a total of 114 million tonnes of carbon were emitted

Seasonal climate (the range of figures indicates Low and High emissions scenario results)

Season	2050s	2080s
Spring	• Warmer by 1.0 to 2.0°C	• Warmer by 1.5 to 3.5°C
	• Precipitation totals similar to now	• Precipitation totals similar to now
Summer	• Warmer by 1.5 to 3.5°C	• Warmer by 2.0 to 5.5°C
	• Drier by 15 to 30%	• Drier by 25 to 55%
Autumn	• Warmer by 1.5 to 3.0°C	• Warmer by 2.0 to 5.0°C
	• Drier by 0 to 10%	• Drier by 5 to 15%
Winter	• Milder by 1.0 to 2.0°C	• Milder by 1.5 to 3.5°C
	• Wetter by 5 to 15%	• Wetter by 10 to 30%
		• Snowfall will decrease by 70 to 90%

in England in 2001, with 2,300 kg carbon emissions per head. Based on these 2001 figures, the South West had joint lowest carbon dioxide emissions of all the English regions at 8 million tonnes carbon (joint with London) and the second to lowest emissions per head at 1,500 kg carbon. Time series is not available for regions but it is estimated that greenhouse gas emissions attributable to England in 2001 had fallen by 15% since 1990.

- Nationally major industrial processes produce a large proportion of UK greenhouse gas emissions, acidifying gases and particles. In 2002 the processes regulated by the Environment Agency accounted for 40% of carbon dioxide emissions, 76% of sulphur dioxide, 26% of nitrogen oxide and 9% of PM10 (fine particles). However, between 1990 and 2002 emissions from these processes reduced significantly – carbon dioxide by 25%, sulphur dioxide 74%, nitrogen oxides 52% and PM10 87%. These reductions are mainly due to the move away from coal and oil energy generation to gas and nuclear. Methane emissions have also fallen since the mid-1980s mainly because of declining coal mining and better waste management practices.
- In 1995 the South West had the lowest emissions from regulated industry of any Environment Agency region in terms of carbon dioxide (1.9 million tonnes), nitrogen oxides (6.9 k tonnes), sulphur dioxide (5 k tonnes) and PM10 (0.6 k tonnes). This is a reflection of the comparatively low concentrations of large coal-fired power stations and other large combustion plants in the region. Generally, emissions of these pollutants declined between 1990 and

1995 - nitrogen oxides by 34%, sulphur dioxide by 9% and PM10 by 7%. However, emissions of carbon dioxide in the South West and Anglian regions increased (by 6% and 35% respectively).

- Wetter winters will increase the risk of river and urban flooding. However, there is growing pressure for housing development on floodplains which presents challenges to local authorities and the Environment Agency.
- Over the coming century the region's water resources will come under greater strain as summer droughts potentially grow longer, demand for irrigation grows and water sources face possible increases in harmful organisms and nitrates. Reduced summer rainfall will also mean that there is less water in rivers to dilute pollutants.
- Salmon and trout are dependent upon cool river waters with plenty of flow. As rivers warm and flow reduces, it is possible that these species may be replaced by more tolerant species but with less economic benefit to the region.
- The Environment Agency's National Water Strategy outlines long-term (25-year) strategies that aim to ensure the sustainable use of water. This concentrates on improvements in water efficiency and recovery in order to provide for extra demand, in terms of agriculture, industry and public water supply.

More detail on climate changes in the future for the South West are summarised in the South West Region Climate Change Impacts Scoping Study – *Warming to the Idea* (2003).

See also **Cleaner air for everyone**.

Improved and protected inland and coastal waters

Long-term vision

Our rivers, lakes, estuaries, groundwater and coastal waters will be far cleaner. They will sustain diverse and healthy ecosystems and contribute to thriving and healthy communities by supporting recreational pursuits (e.g. water sports and fishing).

Water is essential. It is needed in our homes and in manufacturing, industry and agriculture. Society's demand for water needs to be balanced with the needs of the environment.

In comparison to other regions, the South West is one of the most sparsely populated, least industrial and wettest. As a result, water resources and quality are generally good. However, increasing housing demand, economic development and climate change are placing greater pressure on this natural resource.

The coastline and bathing waters of the South West are vital to everyone's quality of life and the region's economy, particularly in terms of their contribution to the tourism and leisure industries.

Current trends

Rivers

- Of almost 6,060km of rivers monitored in the South West by the Environment Agency in 2003, almost all were of good or fair quality – 97% being of good or fair chemical quality and almost 99% being of good or fair biological quality.
- The chemical quality of rivers in the region has been consistently good and is steadily improving. The number of rivers of good or fair quality has improved by 4% (from 93% in 1990 to 97% in 2003). This is consistently above the English average.
- In 2003, chemical river water quality in all of the South West's counties was above the English average (93%). Though still low, Somerset and Wiltshire had the highest number of rivers of poor and bad quality with 6% and 6.4% respectively. Cornwall had the highest proportion of rivers with good chemical quality.
- In terms of biological quality, rivers in the region have significantly improved since 1990, with the number of good and fair quality rivers increasing by 2%. There has been a 3% increase in the number of rivers of good quality over this time period.
- All rivers in 2003 also recorded biological quality above the English average (95%), with the exception of Cornwall (94%). Dorset had the highest proportion of rivers with good biological quality in the region. The majority of counties had no rivers of bad quality in 2003, whilst Dorset and Somerset also recorded no rivers of poor quality. Cornwall had the region's only recording of bad quality rivers (with 1%) and also had the region's highest percentage of those with poor quality (5%).
- The State of England's Chalk Rivers report describes the character and wildlife in the nation's 161 chalk

rivers. This report sets out plans to protect these most English of rivers. Many are in a fragile state, facing pressure from increased water use, urban and infrastructure development, effluent discharges, agriculture and land drainage. Largely located in the South East, four of these rivers also run through the South West in Dorset and Wiltshire. Water quality in these rivers is improving, although only 37% are very good in both biological and chemical quality.

Groundwater

- Groundwater quality in the South West is generally good when compared to the rest of England and Wales.
- Nitrate levels in the region's groundwater (one of the most significant indicators of quality) have been steadily rising over the past few

decades as a result of increased application of fertilisers to agricultural land. Elevated nitrate levels that exceed or are close to the EC Nitrate Directive standard of 50 mg/l have been found at Egford (Somerset) and Duckaller (Devon).

- Groundwater levels in the South West are currently in a good condition, recovering from the dry summer of 2003. However, there is generally no further water available for additional abstractions.
- Long-term industrial activity in Avonmouth has caused a general deterioration in the shallow groundwater over a large area. This aquifer is not regarded as an important resource, although it will have an impact on the quality of water in the surface water system.
- Maps have been produced for the whole of England and Wales showing the vulnerability of groundwater to pollution. These maps do not consider the risk of pollution occurring, but how easily pollutants can move to the water table.

River flows

- River flows in South West rivers are generally good but, on some rivers, the abstraction of water has had an unacceptable environmental impact by reducing rivers flows. These have been identified as the Rivers Wylye and the Avon at Malmesbury (Wiltshire), Piddle (Dorset), Tavy and Taw (Devon). Low flows on the Wylye, Malmesbury Avon and Piddle are caused by abstraction of groundwater by Wessex Water. Work is underway to restore acceptable flows as agreed by the Environment Agency, Ofwat, English Nature and Wessex Water.
- Other low flow problems of concern are on the River Bourne and Nine Mile River in Wiltshire. These are

addressed by the Environment Agency's National Environment Programme and the regional 'Water Resources for the Future' Strategy.
- Catchment scale analysis of water availability has been compiled in the Environment Agency's Catchment Abstraction Management reports.

See also **'Limiting and adapting to climate change'**.

Bathing waters
- Bathing water quality is one of the 147 UK Government core indicators of sustainable development and is also one of the Environment Agency's headline indicators. Of the 491 bathing waters in England and Wales, more than 80% of them now meet the highest EU standard (guideline) with almost 99% meeting the lesser mandatory grade, an increase of more than 20% since 1990. During the 2004 bathing season 98.6% of all bathing waters met the standards in the Bathing Water Directive.
- Bathing water quality in the South West consistently achieves excellent compliance results and has improved between 1991 and 2004. Analysis of trends since 1990 shows a continued increase in bathing water quality, although there was a slight decline in mandatory compliance in 2004. There was one bathing water closure at Dartmouth and Sugary Cove (Devon), although this was due to problems in access to the beach rather than bathing water quality.
- There were 317 Seaside Award beaches in the UK in 2004, awarded to clean, safe, well-managed beaches with good water quality. 83 of these beaches were in the South West, including 32 in Cornwall, 32 in Devon, 5 in Somerset, 13 in Dorset and 1 in Gloucestershire.

- 122 beaches in the UK were awarded Blue Flag status in 2004. These meet strict criteria dealing with water quality, environmental education and information, environmental management, safety and other services. 24 of these beaches were in the South West, including 6 in Cornwall, 10 in Devon, 7 in Dorset and 1 in Gloucestershire. Fowey Harbour was also one of just 12 to be awarded the 2004 Blue Flag Marine UK award.

Estuaries

- 96% of estuaries in England and Wales were classed as being of good or fair quality in 2000, a 4% improvement from 1995 and 6% from 1990. Just 4.1% of estuaries were classed as being of poor or bad quality in 2000, again an improvement on previous survey years.
- With 78.4%, the South West had the third highest percentage of estuaries of good quality in England and Wales in 2000. This figure shows a 1% increase since 1990.
- Due largely to geology and mining activities, some sediments in the Gannel, Hayle, Fal, Looe and Tamar have been identified as amongst the most contaminated by metals in England and Wales.

Shellfish waters

- The South West contains almost 27% (31 out of 119) of designated shellfish waters in England and Wales.
- Shellfisheries are an important part of the fishing industry in the South West, with shellfish accounting for almost 44% of all landings in the major fishing ports in the region in 2003 (valued at £54,300).

- Water quality in the South West shellfish waters is consistently good. In 2003, 13 out of 119 (11%) of shellfish waters in the region failed to meet the imperative standards set in the Shellfish Waters Directive. These failed for high concentrations of zinc, dissolved oxygen and copper. The number of failures reduced by 3 in 2003 compared to 2002.

Marine litter

- Litter on the region's beaches surveyed in Beachwatch 2004 increased by 21% in comparison to 2003 results. On average 4,277 items of litter were recorded per km, which is around 50% higher than the average for England and is significantly higher than any other English region.

See also **Wiser, sustainable use of natural resources**.

Restored, protected land with healthier soils

Long-term vision

Land and soil in both rural and urban areas will be exposed far less to pollutants. It will support a wide range of uses, including production of healthy, nutritious food and other crops, without damaging wildlife or human health. Contaminated land will be restored and protected.

Our regional priorities are to reduce environmental pollution, prevent soil loss and degradation and to remediate contaminated land.

The food, farming, forestry and fishing sectors are some of the most environmentally important industries in the South West. They underpin the natural, built and historic environment which attracts both tourism and investment. These sectors are at the core of our quality of life and set the South West aside from other regions in the UK.

Current trends

Agriculture

- The farming and forestry sectors are some of the most important, in environmental terms, in the South West. The region's landscapes and wildlife are the results of centuries of farming and woodland management.
- In 2003, agriculture accounted for 9,177,390 hectares (almost three-quarters of the total land area) in England. Over 80% of the South West's land area is under agriculture (1,801,559 hectares) making it the most agricultural region in England, with 20% of the national total. The region also has the highest number of agricultural holdings (41,058), almost 25% of the English total.
- Between 1995 and 2003 the total area of land under agriculture in England has remained relatively stable (increasing by 1.4% or 128,204 hectares), a trend that has been mirrored in the South West which showed an slight increase of 2.6% (or 45,482 hectares). The number of agricultural holdings has also increased, by 12% (19,438) in England and by 14% (5,639) in the South West.
- The number of very small farm holdings (of 5 hectares or less) increased by 72% between 1995 and 2003 (compared to almost 65% in England). The number of farm types classified as 'other' during this period increased by 64% in both England as a whole and the South West. These changes are likely to reflect the fragmentation of holdings and an increase in 'retirement' or part-time farming where farm incomes are supplemented by investment or income received 'off farm'. Over time this polarisation of farm holding size could result in fewer but more serious

pollution incidents, mainly from larger enterprises where the risks are greater.

Priorities in the region include working with landowners and managers to reduce pollution from the leaching and run-off of fertilisers, pesticides and farm wastes. Nationally, livestock waste has been one of the main causes of pollution incidents on farms in recent years. The number of pollution incidences from agriculture has fallen since 1991, with Category 1–3 incidents declining by 8% in 2004 for the third consecutive year (see A 'greener' business world for more information). A number of projects are taking place in the region to help farmers reduce their impact on the environment, such as Landcare, Cycleau Project and the Parrett Catchment Project. These initiatives involve Environment Agency staff alongside external

organisations such as the Farming and Wildlife Advisory Group (FWAG).

- Farmers and landowners in the South West have taken greater advantage of agri-environment schemes than any other region, with 8500 agreements covering 29% of eligible land, worth £40 million to the rural economy.
- Organic farming is of increasing importance in the South West, with 902 organic farms in 2003 covering a total of 97,159 hectares. This accounted for nearly 5.5% of the total agricultural land area in the region and 37% of the English total (258,930). Organic farming varies considerably at the sub-regional level, ranging from almost 9% in Wiltshire to 3.5% in Cornwall and the Isles of Scilly.

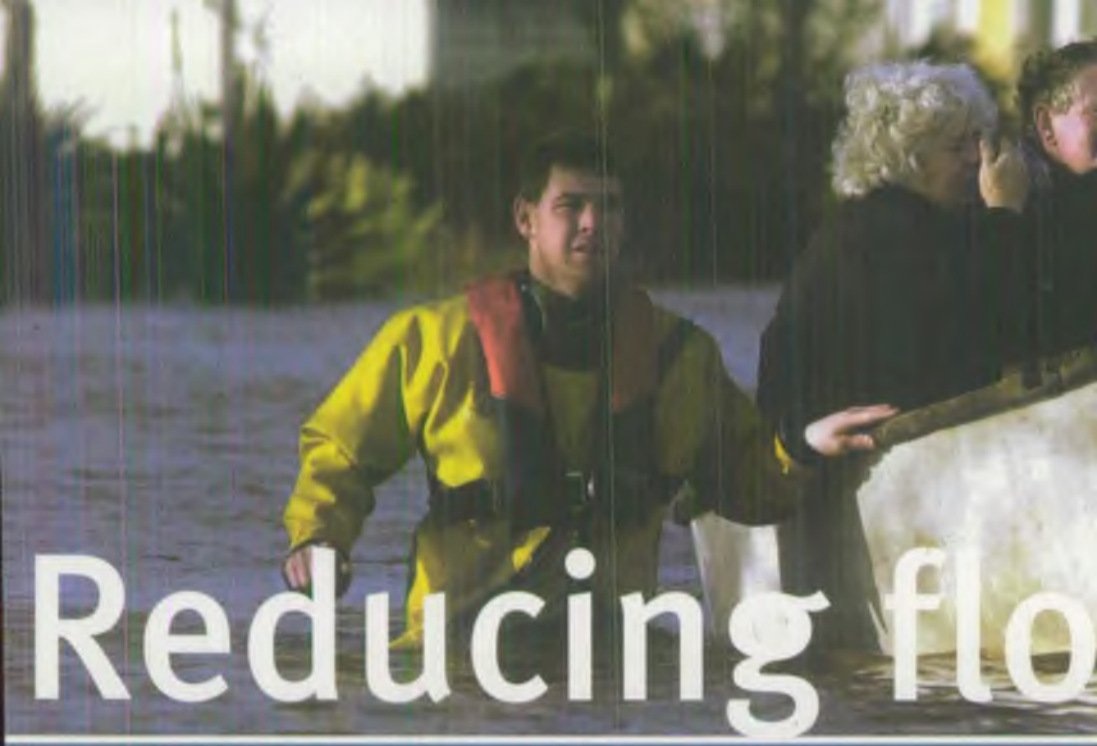
Soils and erosion

- Identifying practical soil management options to reduce erosion has to be undertaken on a case by case basis. Defra launched a new agri-environment scheme for England in March 2005. Known as Environmental Stewardship it contains measures to help reduce soil erosion. Erosion measures may also be included in a scheme being proposed for Wales.
- The region's high rainfall, steep slopes and vulnerable soils result in increasing problems with water pollution and run off. The most vulnerable soils in the region include the Devon Redlands, sandy soils in the South Hams, sandy silt soils in West Cornwall, sandy soils in the Vale of Taunton, the Yeovil sands and the Vale of Pewsey.
- 81% of sites surveyed for cultivated land on silt and fine sandstone

landscapes in the South West have severely or highly degraded soil structure. This is the first major survey of soil structure in the region, which will help to set a baseline for future analysis.

- A report on The State of Soils in England and Wales and a Soil Action Plan 2004-2006 is available from the Environment Agency.

See also **A 'greener' business world.**



Reducing flo

Long-term vision

Flood warnings and sustainable defences will continue to reduce property damage and distress due to flooding. The role of wetlands will be recognised. Flood risks due to land use and climate change will be assessed and used to influence planning decisions.

Flooding impacts on the natural and built environment, with resulting demands across the region on private and public resources, as well as the planning system. About 7% of the region's total area is within tidal or river floodplain and there are currently 100,000 properties in the region at risk of river and coastal flooding, below the national average. Within the currently mapped defended areas, there are 40,000 properties.

The primary role of Flood Risk Management is to reduce the risk of flooding from rivers and the sea. To assist with the allocation of resources a risk-based approach is being adopted to help allocate resources and deliver effective schemes and a reliable flood warning service.

od risk

Aside from national targets we have regional priorities that reflect the largely rural nature of the region and the often remote locations of flooding. These include promoting community self help, improving local flood defence asset condition, and improving the coverage of flood warning services. There are also specific objectives to reduce development within the floodplain.

In order to integrate the environment into planning in the region, opportunities will also be explored for creating/recreating natural ecological systems for managing the effects of climate change, such as restoring natural floodplains and considering opportunities for coastal realignment.

In 2004, there was a major flash flood at Boscastle and elsewhere in North Cornwall. The impacts on both the natural and built environment were dramatic, reminding all involved of the devastation that flooding can bring.

Current trends

Regional Planning Guidance (RPG10) for the South West, produced by the Regional Assembly, provides a spatial strategy within which local authority development and transport plans can be prepared. The guidance sets out a broad development strategy for the period to 2016 and beyond. It also provides the spatial framework for other strategies and programmes.

- The Government has increased investment in Flood Risk Management nationally from £300 million in 1996-1997 to around £564 million in 2005-2006. Flood risk management expenditure in the South West amounted to £56.5 million in 2005–2006, an increase of £14.5 million on 2004–2005 reflecting the increasing threat of severe weather events from climate change (see table).
- In the South West there is 900km of flood defences and approximately

Reporting year	South West Environment Agency expenditure on Flood Risk Management
2002/2003	£39.5 million
2003/2004	£42.8 million
2004/2005	£42 million
2005/2006	£56.5 million

4,500 individual structures protecting urban areas. Of these flood defences, 56% are in good condition or better and 5% are in poor condition or worse. Of the structures, 68% are in good condition or better and 6% are in poor condition or worse. These figures are the result of a new method of reporting, in line with the Environment Agency Strategy for Flood Risk Management and will provide a baseline for future years.

- Climate change scenarios predict that winters will be 5–15% wetter and heavy rainfall events will be more common by 2050. It is estimated nationally that the annual damage from flooding could rise from the present level of £1 billion to about £25 billion in the worst case scenario. The number of people at a high risk from flooding could also rise from 1.5 million to 3.5 million.

Year	Number of properties flooded
1996	313
1997	187
1998	127
1999	631
2000	1,286
2001	323
2002	314
2003	312
2004	582

- We gather data on flood events. A project currently underway is looking through historic records to establish the history of flooding in the South West. The record of flooded properties in the region is not yet complete, but the figures gathered so far show that the number of properties flooded has varied year on year depending on weather patterns.
- The number of planning applications where the Environment Agency objected on flood risk grounds in the region increased slightly from 1,274 to 1,354 between 2003 and 2004

compared to the previous year. However, this may be partly explained by changes to the reporting boundary. The number of decision notices that were returned on these objections also increased slightly from the previous period, from 769 to 872. 86 applications were approved contrary to our advice.

See also **Limiting and adapting to climate change**.

Planning stage	Number of applications
No. of planning applications on which the Environment Agency responded by objecting on flood risk grounds	1,354
Total No. of LPA decision notices received by Environment Agency for objections on flood risk	872
No. of decisions where application was approved by LPAs contrary to Environment Agency advice	86

Wiser, sustainable use

Long-term vision

Everyone will take responsibility for minimising the waste they produce. Waste will increasingly be seen as a potential resource. Intensive re-use and recycling of materials and efficient use of energy will become the norm. More products will be designed, marketed and licensed to minimise environmental costs. Water will be a valued resource, used wisely by everyone.

Minimising waste is always our ultimate goal. When we cannot minimise waste we should strive to recover value from waste materials by recycling, composting and capturing the energy value inherent in materials.

# of natural resources

The Regional Waste Strategy sets out a vision and the actions required over the next 20 years to move the South West away from over reliance on landfill disposal. It also aims to develop the recovery and recycling infrastructure and culture that helps to break the link between economic growth and damage to our environment.

The Environment Agency's National Water Strategy outlines long-term (25-year) strategies that aim to ensure the sustainable use of water. This concentrates on improvements in water efficiency and recovery in order to provide for extra demand in terms of agriculture, industry and public water supply.

Current trends

Waste

- An estimated 29.3 million tonnes of municipal waste were produced in England during 2002–2003, 88% of which came from household sources. This reveals an increase of almost 2% (28.8 million tonnes) in total municipal waste on 2001–2002, which is below the annual average increase of 3% recorded since 1996 – 1997. Around 25% of this was recycled.
- Almost 2.88 million tonnes of municipal waste were produced in the South West during 2003–2004. This was 24,000 less than in 2002–2003 but still 2% (or 42,000) more than 2001–2002.
- Household waste in the region is currently growing at an average of over 3.4% annually, however our population is growing by just 0.5%.
- Offices, shops and factories produced over 5 million tonnes of waste per year. Defra estimate that the commercial sector generates 12% and the industrial sector 14% of the total waste in the region. Around one-third of the South West's commercial and industrial waste was reused or recycled in 2001–2002.
- There has been a continued decrease in the proportion of municipal waste disposed of at landfill in England, from 78% in 2001–2002 to 72% in 2003–2004. In 2001–2002, 81% of all municipal waste was sent to landfill in the South West, the third highest of the English regions (behind the North East and Yorkshire and the Humber). However this reliance mirrored the overall England trend and reduced by 6% between 2001–2002 and 2003-2004.
- The region's household recycling rate increased by almost 5% between 2001–2002 and 2003–2004, from 16.6% to 21.4%. This was the third

highest recycling rate of the English regions (behind the East and South East).

Water resources

- Over the coming century the region's water resources will come under greater strain as summer droughts potentially grow longer, demand for irrigation grows and water sources face possible increases in harmful organisms and nitrates. Reduced summer rainfall will also mean that there is less water in rivers to dilute pollutants.
- Total abstractions increased by 15% in the South West between 1995 and 2002, compared to around 9% nationally. There is little summer water available for increased abstraction in the region, and no further groundwater resources available. However, additional surface water is available in winter, with some exceptions.
- Water consumption used by each individual at home (known as household per capita consumption) has been steadily increasing in the South West, from just over 146 litres/head/day in 2000–2001 to almost 155 litres/head/day in 2003–2004 (an increase of 9 l/h/d over 4 years).
- Average monthly flows recorded at gauging stations in South West rivers were below the long-term average in January 2005, with the exception of Thorverton on the Exe (Devon). These low flows, largely due to relatively low annual rainfall, are a key concern for the Environment Agency in the region and recent studies have focussed on the River Wylye, River Piddle and Malmesbury Avon in the Wessex Water catchment.

A 'greener' business world

Long-term vision

Environmental concerns will be at the heart of business thinking and operations. Industry and business will value the services that come from a rich and diverse natural environment. In the process, they will reap the benefits of sustainable business practices, improve competitiveness and secure trust in the wider community.

Diffuse pollution is defined as 'pollution arising from land-use activities (urban and rural) that are dispersed across a catchment or sub-catchment, and do not arise as a process industrial effluent, municipal sewage effluent, deep mine or farm effluent discharge'. It is distinct from pollution that can be identified as originating from one place, a point source - it is therefore inherently more difficult to trace and prevent, often being transient in nature.

Current trends

- In 2004 there were 25,196 substantiated pollution incidents in England and Wales, a 15% (or 4,398 incidents) decline on 2003. Of these incidents 114 were of the most serious nature or Category 1 (an increase of almost 18% or 20 incidents on 2003) and 594 were significant or Category 2 (a decrease of around 14% or 685 incidents on 2003).
- Of the 25,196 substantiated national pollution incidents, 3,538 (or 14%) occurred in the South West. This ranked the region as having third highest number of incidents in England and Wales. The Midlands had the highest number (4,066) followed by the North East (3,887). Substantiated pollution incidents in the region have declined over the last 5 years - reducing by 10.5% on 2003 (3,952), by 19.5% on 2001 (4,393) and by over 30% since 2000 (5,117).
- Category 1–3 pollution incidents from agricultural sources declined by 8% in 2004 for the third consecutive year, incidents from domestic sources reduced by 11% whilst those resulting from the water industry reduced by over 15%. However, incidents from the manufacturing sector, which previously have not been significant, have increased by 54% in terms of Category 2 (11 compared to 6 in 2003).
- 11 substantiated Category 1 incidents occurred during 2004 in the South West, around 10% of the national total for this category and an increase of 27% (or 3 incidents) on 2003. Oils and fuel (3 incidents) and agricultural slurry (3 incidents) were the main pollutants in these incidents as well as biodegradable materials (2 incidents), suspended solids (1 incident), inorganic chemicals (1 incident) and organic

Category	England and Wales	South West
1 (most serious)	114	11
2 (significant but less severe)	594	69
3 (minor)	10,875	1,609
Total (including Category 4 – no environmental impact)	25,196	3,538

2004 pollution incidents

chemicals (1 incident). The primary sources of these incidents can be seen in the table.

- 69 Category 2 incidents occurred in the region during 2004, accounting for 11% of the national total for this category and the third lowest number in England and Wales. Incidents of this category have been declining steadily and have been reduced by 29% since 2001.
- 1,609 Category 3 (minor) incidents occurred in the region during 2004, the second highest regional figure in the country accounting for around 15% of the national total. The number of minor incidents has declined over the last 5 years, by 11% compared to 2003 and 26% since 2001.

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Sector	Total number of incidents
Agriculture	3
Domestic and residential	2
Manufacturing	3
Waste management	1
No specific premises	2

Primary sources of Category 1 incidents in the South West: 2004

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This map shows the Environment Agency South West Region boundary.

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