Report No. 139

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Climate - Water - Sustainability
Identifying pressures • Informing policy • Developing solutions

Climate Status Report Compilation Guidelines

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Comhshaol, Pobal agus Rialtas Áitiúil
Environment, Community and Local Government

www.epa.ie

ENVIRONMENTAL PROTECTION AGENCY

The Environmental Protection Agency (EPA) is responsible for protecting and improving the environment as a valuable asset for the people of Ireland. We are committed to protecting people and the environment from the harmful effects of radiation and pollution.

The work of the EPA can be divided into three main areas:

Regulation: *We implement effective regulation and environmental compliance systems to deliver good environmental outcomes and target those who don't comply.*

Knowledge: *We provide high quality, targeted and timely environmental data, information and assessment to inform decision making at all levels.*

Advocacy: *We work with others to advocate for a clean, productive and well protected environment and for sustainable environmental behaviour.*

Our Responsibilities

Licensing

We regulate the following activities so that they do not endanger human health or harm the environment:

- waste facilities *(e.g. landfills, incinerators, waste transfer stations)*;
- large scale industrial activities *(e.g. pharmaceutical, cement manufacturing, power plants)*;
- intensive agriculture *(e.g. pigs, poultry)*;
- the contained use and controlled release of Genetically Modified Organisms *(GMOs)*;
- sources of ionising radiation *(e.g. x-ray and radiotherapy equipment, industrial sources)*;
- large petrol storage facilities;
- waste water discharges;
- dumping at sea activities.

National Environmental Enforcement

- Conducting an annual programme of audits and inspections of EPA licensed facilities.
- Overseeing local authorities' environmental protection responsibilities.
- Supervising the supply of drinking water by public water suppliers.
- Working with local authorities and other agencies to tackle environmental crime by co-ordinating a national enforcement network, targeting offenders and overseeing remediation.
- Enforcing Regulations such as Waste Electrical and Electronic Equipment (WEEE), Restriction of Hazardous Substances (RoHS) and substances that deplete the ozone layer.
- Prosecuting those who flout environmental law and damage the environment.

Water Management

- Monitoring and reporting on the quality of rivers, lakes, transitional and coastal waters of Ireland and groundwaters; measuring water levels and river flows.
- National coordination and oversight of the Water Framework Directive.
- Monitoring and reporting on Bathing Water Quality.

Monitoring, Analysing and Reporting on the Environment

- Monitoring air quality and implementing the EU Clean Air for Europe (CAFÉ) Directive.
- Independent reporting to inform decision making by national and local government *(e.g. periodic reporting on the State of Ireland's Environment and Indicator Reports)*.

Regulating Ireland's Greenhouse Gas Emissions

- Preparing Ireland's greenhouse gas inventories and projections.
- Implementing the Emissions Trading Directive, for over 100 of the largest producers of carbon dioxide in Ireland.

Environmental Research and Development

- Funding environmental research to identify pressures, inform policy and provide solutions in the areas of climate, water and sustainability.

Strategic Environmental Assessment

- Assessing the impact of proposed plans and programmes on the Irish environment *(e.g. major development plans)*.

Radiological Protection

- Monitoring radiation levels, assessing exposure of people in Ireland to ionising radiation.
- Assisting in developing national plans for emergencies arising from nuclear accidents.
- Monitoring developments abroad relating to nuclear installations and radiological safety.
- Providing, or overseeing the provision of, specialist radiation protection services.

Guidance, Accessible Information and Education

- Providing advice and guidance to industry and the public on environmental and radiological protection topics.
- Providing timely and easily accessible environmental information to encourage public participation in environmental decision-making (*e.g. My Local Environment, Radon Maps)*.
- Advising Government on matters relating to radiological safety and emergency response.
- Developing a National Hazardous Waste Management Plan to prevent and manage hazardous waste.

Awareness Raising and Behavioural Change

- Generating greater environmental awareness and influencing positive behavioural change by supporting businesses, communities and householders to become more resource efficient.
- Promoting radon testing in homes and workplaces and encouraging remediation where necessary.

Management and structure of the EPA

The EPA is managed by a full time Board, consisting of a Director General and five Directors. The work is carried out across five Offices:

- Office of Climate, Licensing and Resource Use
- Office of Environmental Enforcement
- Office of Environmental Assessment
- Office of Radiological Protection
- Office of Communications and Corporate Services

The EPA is assisted by an Advisory Committee of twelve members who meet regularly to discuss issues of concern and provide advice to the Board.

EPA Research Programme 2014-2020

Climate Status Report Compilation Guidelines

EPA Research Report

Prepared for the Environmental Protection Agency

by

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DISCLAIMER

The EPA Research Programme addresses the need for research in Ireland to inform policymakers and other stakeholders on a range of questions in relation to environmental protection. These reports are intended as contributions to the necessary debate on the protection of the environment.

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Introduction

The first edition of "The Status of Ireland's Climate" was published in early 2013[1]. The State of the Climate was defined specifically in terms of the Essential Climate Variables (ECVs) of the Global Climate Observing System (GCOS). The report presented the status of the climate observation systems themselves and also high level analyses of the data collected by these, in terms of time series and trends in the observations of the variables. The report presented a national perspective on climate change and allowed it to be put in the context of regional and global trends.

By providing periodic updates of this report, it will be possible to highlight improvements or shortcomings of the observation systems and raise awareness of trends and change in the climate itself.

The aim of this document is to give guidance on the compilation of a periodic climate status report, based on the experience of compiling the 2013 edition. It addresses the issues that should be taken into account in terms of the scope of the report, the key content for each chapter, and it provides a step-by-step guide to compiling the individual ECV chapters.

[1] **Dwyer, N, (ed.)** (2013), The Status of Ireland's Climate, 2012, Climate Change Research Programme Report 26, EPA, Dublin,

http://www.epa.ie/pubs/reports/research/climate/ccrpreport26.html

Publication frequency, variables and format

Table 1 lists the ECVs as described by GCOS (2010). These are subject to change, as the observation requirements are reviewed on a regular basis. The Status Report should present information on all variables of relevance to Ireland. In general, the cryosphere variables are not relevant.

The first Status Report was published in January 2013. Where possible, observations to the end of 2011 were presented (e.g. surface temperature, rainfall) and, in some cases, into 2012 itself (e.g. CO_2 concentration). In other cases due, for example, to lack of analysis, discontinued observations or unreliable data, the observation periods finished earlier (e.g. ocean salinity, ocean acidity, Leaf Area Index). In general, the observations should be as up-to-date as possible. The length of the observation period presented varies across the ECVs described (e.g. surface temperature (1880-2011), Leaf Area Index (2002-2009)). Where possible, the longest observation period, containing reliable data, should be presented.

The Status Report should be produced on a regular basis - every four or five years. For example, the EPA's report on Ireland's Environment is produced every four years; the IPCC Assessment Reports have been published every six years. As the main goal of this Status Report is to highlight trends and changes in climate and the observation system itself, more frequent updates are of limited value. A longer interval between reports may delay the highlighting of emerging trends and could also be seen as not recognising the importance of climate observations.

The audience for the Status Report is all those interested in our changing climate. It is not aimed specifically at academics or researchers. In order to be attractive to, and understandable by, such a wide audience, it needs to be graphically appealing and colourful. In terms of layout, it should not appear as an academic or research report but as a more accessible document with a mix of text, graphics and photographs.

The main dissemination mechanism will be electronic, via the Internet. As well as providing access via the EPA's website publications section, a useful location for the report would be Climate Ireland – Ireland's Climate Information Platform. Here, it could be provided as one integral document but it could also be provided in sections, thereby allowing users to search for specific variables. The key indicators section (http://climate.nasa.gov/key_indicators) of NASA's climate change web pages and the web version of the Swiss National Climate Observing System report (http://www.meteoschweiz.admin.ch/web/en/meteoswiss/international_affairs/gcos/uebersicht_klimabeobachtung/nationales_klimabeobachtungssystem/Kohlendioxid.html) are relevant examples. Other agencies such as Met Éireann, the Marine Institute and Teagasc should also be encouraged to publicise the report.

If possible, a number of printed copies should also be produced, as it is a reference document of which people may read particular sections, rather than reading it from cover to cover.

Table 1. The GCOS Essential Climate Variables.

Domain		Essential Climate Variables
Atmospheric	Surface	Air temperature, Precipitation, Air pressure, Surface radiation budget, Wind speed and direction, Water vapour.
	Upper air	Earth radiation budget (including solar irradiance), Upper-air temperature, Wind speed and direction, Water vapour, Cloud properties.
	Composition	Carbon dioxide, Methane, Ozone, Other long-lived greenhouse gases, Aerosol properties.
Oceanic	Surface	Sea-surface temperature, Sea-surface salinity, Sea level, Sea state.
	Sub-surface	Sea ice, Surface current, Ocean colour, Carbon dioxide partial pressure, Ocean acidity, Phytoplankton,Temperature, Salinity, Current, Nutrients, Carbon dioxide partial pressure, Ocean acidity, Ocean tracers, Oxygen.
Terrestrial	Land surface	Albedo, Land cover (including vegetation type), Fraction of absorbed photosynthetically active radiation (fAPAR), Leaf area index (LAI), Above-ground biomass, Soil carbon, Fire disturbance, Soil moisture, Permafrost.
	Hydrology	River discharge, Water use (irrigation), Ground water, Lakes, Snow cover, Glaciers and ice caps, Ice sheets.

Key content for the status report

The content of the climate status report may vary a little in each edition, depending on the interests and style of the author/s and editor/s and the requirements of the EPA. Nevertheless, at a minimum, the following sections are most likely to be relevant:

Executive Summary: It is likely that many readers will only read the Executive Summary, so it needs to provide a coherent and concise overview of the project, with a focus on the main findings, and a recommendations section highlighting remaining gaps, issues and concerns that need to be addressed.

Overview and Context: The work needs to be set in the context of global climate change, observed trends, and research and developments taking place in climate observation science and implementation. Key modifications to the GCOS implementation plan since the publication of previous editions should be highlighted, as well as any other international and national policy, legal or operational issues of relevance.

Aims and Objectives: The focus of the report should be clearly described.

Observations in Ireland: An overview of the climate observation infrastructure itself should be provided and any changes (improvements and degradations), with respect to previous editions of the report, should be highlighted.

Individual ECV descriptions: These are the key elements of the report and the material that should be described is presented in the next section.

Discussion and Recommendations: Any major issues arising as a result of the research should be discussed. This concerns both the observation systems themselves but also the results of the analyses of the data. The discussion should try to pull together any common threads across thematic areas (atmosphere, oceans, terrestrial) and any over-arching issues that have emerged. A clear and short set of recommendations emerging from the research should be presented.

Individual ECV descriptions

For each individual ECV description, a number of sections should be included, and their content is described here.

Justification for the observations

A brief definition and introduction to the ECV should be provided (Figure 1). The reason why it is important to observe this variable should be clearly presented. If possible, present it in an international and/or regional context.

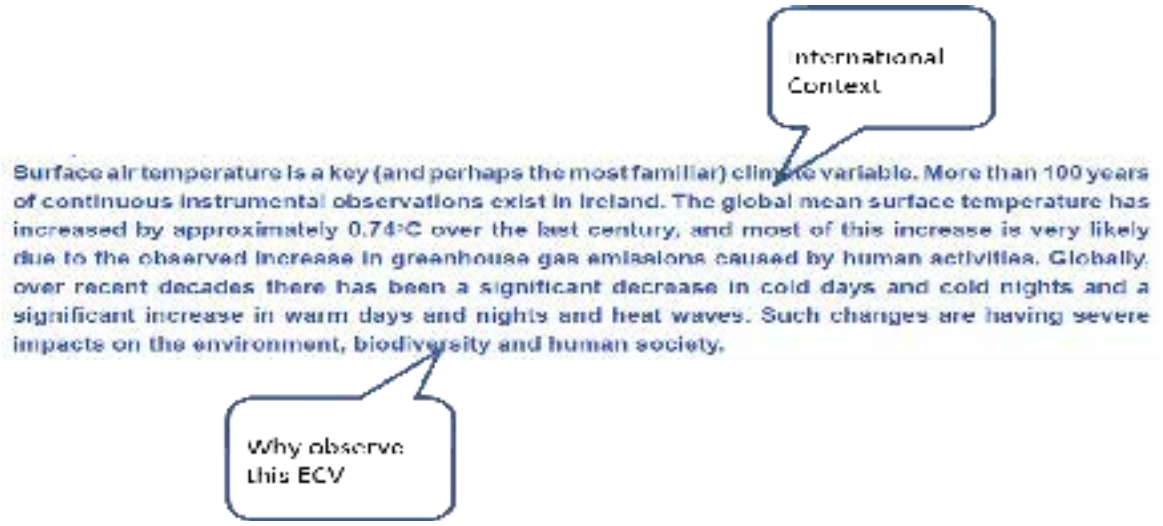

Figure 1. Example of content of section introducing the specific ECV.

Observational infrastructure

This section (Figure 2) should present insofar as is possible:

- The organisation(s) responsible and mandated for carrying out the observations
- The specific parameter(s) that is/are measured
- Where the observations take place, including a map
- How long the observations have taken place – length of period of observation
- The frequency of the observations.

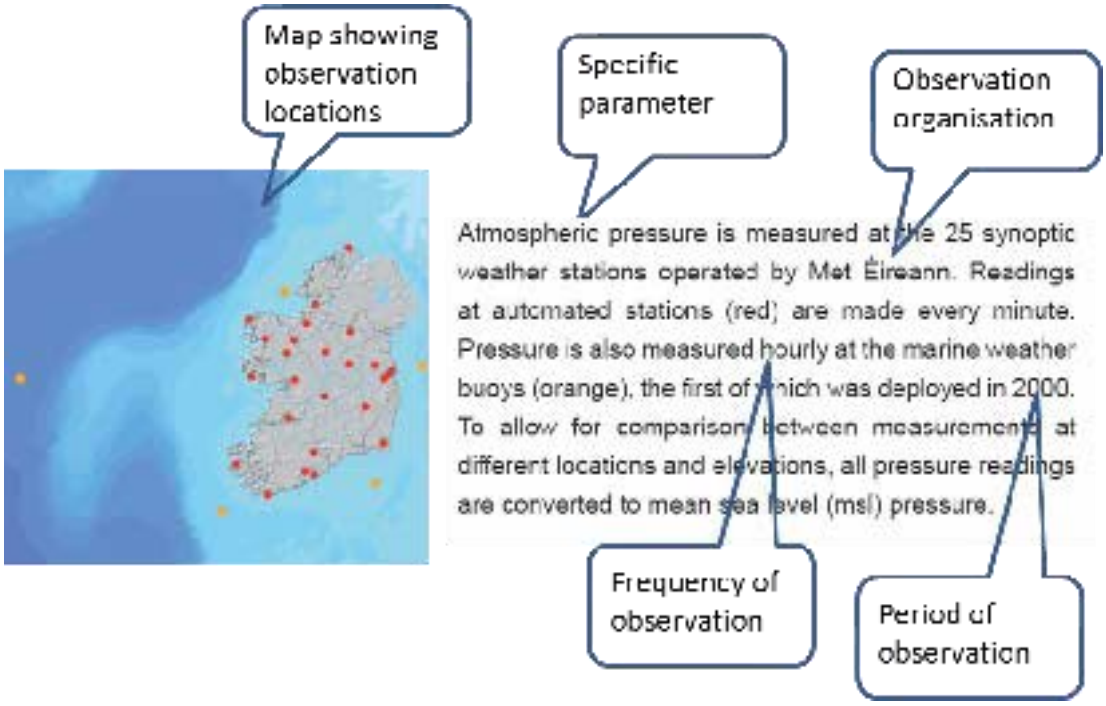

Figure 2. Example of content of section on observational infrastructure.

Time series and trends

This is the focal point of the section. This should present the clearest and most distinctive trends, representative of the national situation, for the ECV. Where possible, draw on the most recently published peer-reviewed material or reports from reputable research or operational organisations.

The textual description should be supported by an appropriate graphic demonstrating the described trend (Figure 3). The graphic needs to be extremely clear, unambiguous, correctly annotated and easy to understand. Where no clear trend exists, or where limited analyses have been carried out, a representative graphic illustrating some aspect of the ECV should be presented. Both in-situ and satellite observations should be presented where appropriate.

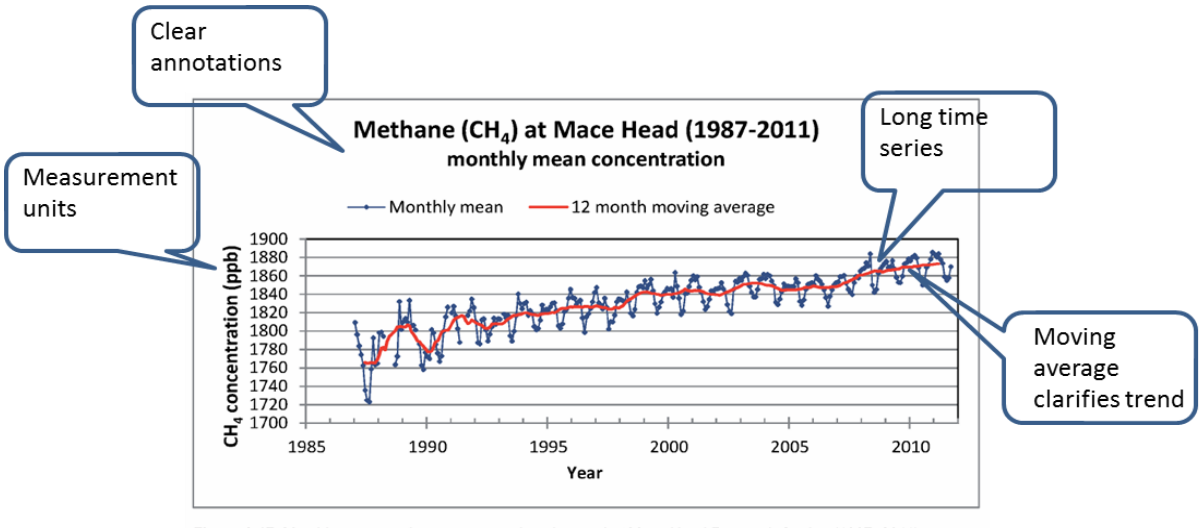

Figure 2.17. Monthly mean methane concentration observed at Mace Head Research Station (1987–2011).

Figure 3. Example of content of section on time series and trends.

Maintaining the observations

This section should highlight any gaps in the observations, in terms of funding, infrastructure or data analysis (Figure 4). It should briefly describe how the observational infrastructure, operations and data analysis are funded, and the security and sustainability of long-term funding. Any inadequacies or shortcomings in the observation network, or plans for upgrades, should be mentioned. The completeness, or otherwise, of analysis should be presented.

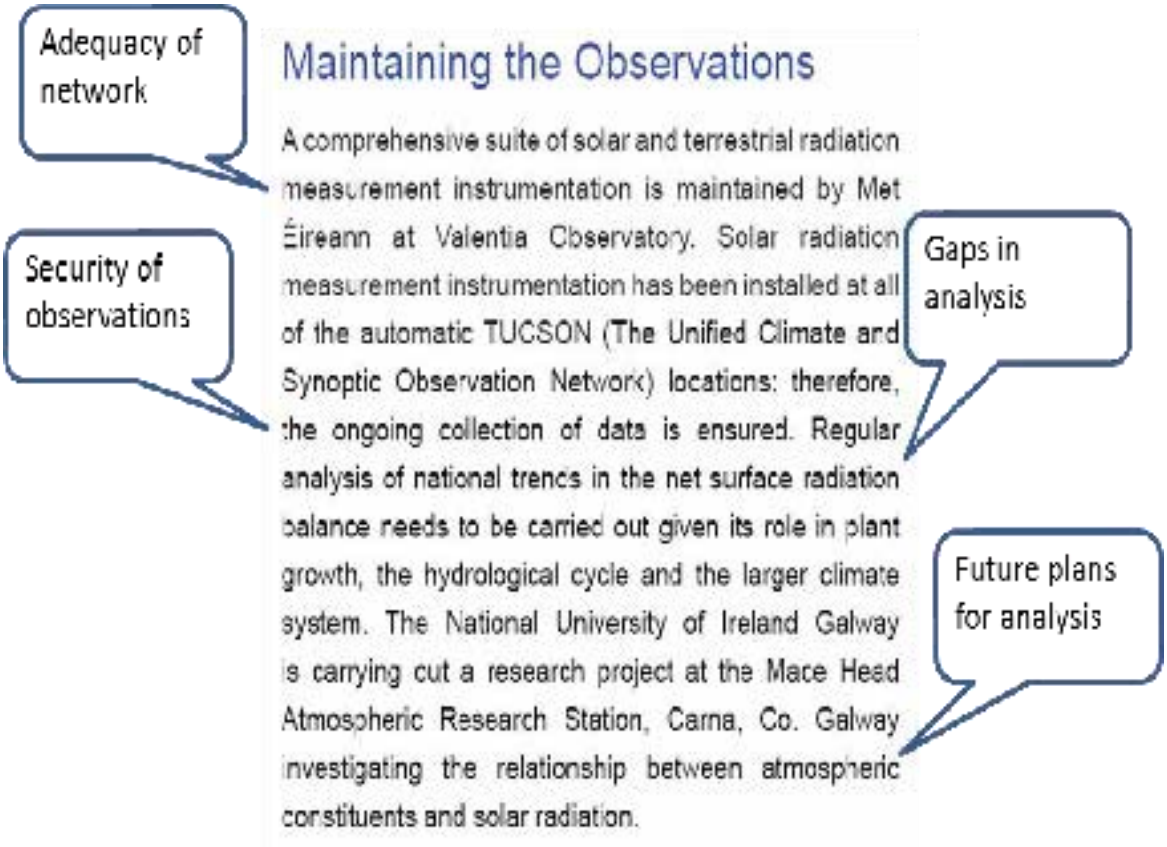

Figure 4. Example of content of section on maintaining the observations.

Further information and data sources

Academic style referencing is not used in the text in order to facilitate accessibility by a wider audience.

However, any documents used to compile the text or figures in the chapters should be listed in this section. Links to related relevant material and data sources should also be provided (Figure 5).

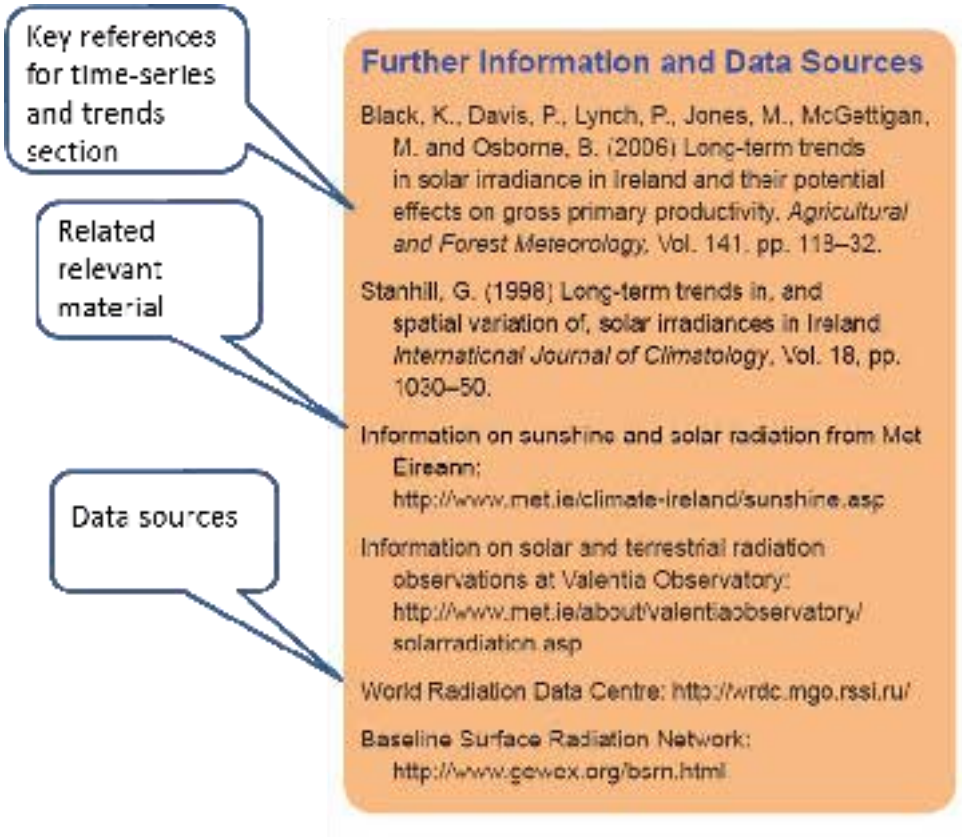

Figure 5. Example of content of section on further information and data sources.

Stepwise guide to producing the content

Step 1 – Establish steering committee

Ensure a steering-committee, representing the main agencies and organisations involved in climate observations in the key thematic areas (atmosphere, oceanic, terrestrial), is established. This should ensure commitment to, and oversight of, the reporting process by these organisations. Ensure that the steering committee is kept up-to-date on the development of the report and has the opportunity to contribute as necessary. The EPA will give guidance on appropriate members for the steering committee.

Step 2 – Select ECV parameters

Review the latest GCOS observation requirements and decide on variables and specific parameters to be presented. For each variable, review the most recent peer-review literature and reports of relevance to the Irish situation, in order to understand the level of data and information availability and degree of analysis that has been carried out.

Step 3 – Decide what to present

For each variable, explore the frequency of observations and decide on the most appropriate to be shown (e.g. daily, monthly, yearly) and the spatial representativeness (e.g. one site, multiple sites, national average).

Step 4 – Identify data holders

Identify primary data holders (institution and contact person) and/or the data infrastructure (e.g. world data centre) from where the most appropriate data may be sourced. This information can usually be found in relevant published materials and reports. In some cases, those who carried out relevant analysis of underlying data may be a more appropriate contact.

Step 5 – Contact data holders

Contact the appropriate data holder and request, as precisely as possible, the data and information required. It is preferable to acquire data rather than pre-made figures or graphs, as the compiler can then create the required figures in the appropriate style and format. If the section is co-authored, provide a section template to the main author and explain clearly what is required. It is useful to provide a worked example.

This step can be a major bottleneck in the process. You may have to send a number of reminders, follow-up by phone, or it may be that the data you requested is not readily available or reproducible.

In some cases, the appropriate information may originate from both in-situ and satellite observations and, in a number of cases, it may be exclusively satellite-derived. Regarding satellite observations, firstly look for data and information that has been processed and analysed specifically for the Irish region. If this is not available, analyse the available data products and information most applicable to Ireland. You may need to illustrate the ECV with a selected example if a complete analysis does not exist. For example, in the Report, the annual average Chlorophyll-a concentration for the period 1997-2010, as derived from satellite, is shown for an area around Ireland, whereas the total column ozone content for the northern hemisphere is shown for only one day in 2010.

Step 6 – Draft example chapters

Draft a couple of complete example ECV chapters for those variables where data are readily accessible. Include section headings, graphical material and appropriate links. Circulate to the steering committee and confirm agreement on layout, content and how time series data and trends should be illustrated.

Step 7 – Prepare figures

Once you receive the data, they need to be prepared, processed and/or analysed and the appropriate figure(s) created. The authors will need to prepare explanatory material to accompany the figures. This should be as non-technical as possible, whilst trying to convey a clear message about any trends or key patterns in the data.

Time series graphs are the most useful to convey any interesting trends in the data. Moving averages and trend lines can be over-plotted to aid visual interpretation, but should be used with caution and in a way that is mathematically rigorous.

Some observations may be derived exclusively from satellite data, whereas in other cases there are both in-situ and satellite observations. Where possible, illustrate how satellite observations can complement those made in-situ. Identify appropriate satellite sources and analyses. Decide on how you want to display the data and what message you want to convey. A brief interpretation of the data displayed is also required.

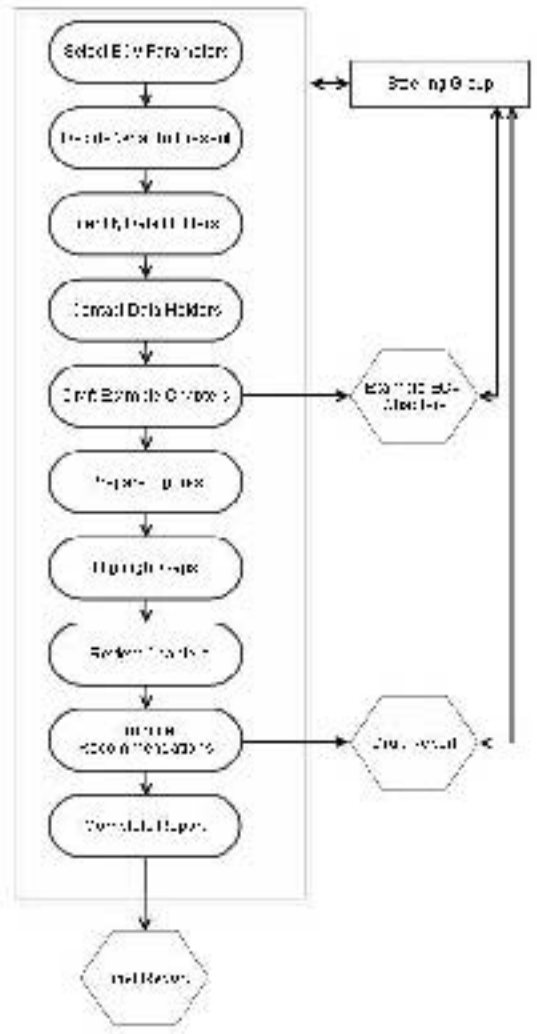

Figure 6. Overview of steps for compilation of Climate Status Report.

Step 8 – Highlight gaps

Determine any gaps or shortcomings that exist in the observational infrastructure, in terms of instrumentation, spatial representativeness and adequacy, operational support, data storage, data analysis, funding and sustainability. Highlight observations that are made only on a project basis, and lack long-term institutional support or resourcing. Document plans for systems' upgrades and planned analyses.

Step 9 – Review chapters

Ensure co-authors are asked to review chapters they contributed to and seek their permission to be named as co-authors. The consent of contributors of photographs, graphics and any other materials used in chapter compilations should be sought and these contributions should be acknowledged.

Step 10 – Produce recommendations

Produce the report conclusions and recommendations. These should be based on an analysis of all the ECV chapters, as well as relevant information from data holders, chapter authors and others consulted during the report compilation itself. Once a draft has been produced, seek agreement from the steering committee.

Step 11 – Complete report

Complete the report by providing introductory material to set the context, summarise changes to the observation infrastructure since the publication of previous editions, and highlight key changes to the climate itself. A clear and concise executive summary, including recommendations, should also be written.

Figure 6 shows a flow diagram of the steps necessary to compile the climate status report.

Illustrations

The report should be visually appealing. High quality photographs should be used, where possible. The first edition of the report contained some photos by the author and colleagues at UCC. A good source is also the Irish Meteorological Society (http://www.irishmetsociety.org/), which co-ordinates an annual photographic competition. The EPA also has a photographic archive. Ensure that permission for reproduction of all photographs is sought and has been given before publication, and that all photographers are appropriately credited.

Gaps in observations and analysis

Table 1.2 in the Climate Status report provides an overview of the periods for which data are available, as well as the level of analysis that has been carried out. Some of the current key concerns around observation programmes, data availability and analysis in each of the three thematic domains, namely atmosphere, oceans and terrestrial, are highlighted here.

Atmosphere

Comprehensive observation programmes are in place for most of the atmospheric variables, although some programmes are funded on an ad-hoc basis. Other shortcomings include data inhomogenities and limited analyses of data already collected.

Project-based data observations

The collection of observations for many of the atmospheric concentration variables is funded via ad-hoc projects, which is less than ideal.

- Observations of column O_3 at Valentia Observatory are funded from Met Éireann's operational budget but the programme lacks long-term committed financing.
- The cloud and aerosol observation programmes at the Mace Head Atmospheric Research Station run by the Centre for Climate and Air Pollution studies (C-CAPS) at NUIG are also lacking long-term and sustainable operational support.
- Observations of CO_2, CH_4 and other greenhouse gases (GHG) at Mace Head are funded by the Laboratoire des Sciences du Climat et l'Environnement (LSCE), France and the Department of Energy and Climate Change (DECC), UK, respectively. It is vital to ensure that ongoing support of these observation programmes is maintained and that alternative potential funding sources are identified, should the support of these organisations be terminated for any reason.

Data homogenisation

Difficulties can arise with time series data because of inhomogenieties due to changes in instrumentation, observer, location and timing of observation, and new building and tree growth in the vicinity of a station. This is the case for Met Éireann's surface and upper air temperature, rainfall, and surface and upper air wind observations, in particular. Nonetheless, all data should be checked for inhomogenities. Homogenisation will need to be carried out on these data before any meaningful analysis of changes or trends is undertaken. A related issue is that many of the earliest observations from the 19th and early 20th centuries are archived on paper only. The observations themselves, as well as the related station metadata, need to be digitised.

Limited analysis

In addition to the difficulties posed by inhomogenous data, limited resources may also be problematic for maintaining observations. For example, Met Éireann has only limited analysis of observations including pressure, water vapour and radiation. The potential of funding such analyses through university research groups or other centres should be explored.

Oceans

Many of the ocean observation programmes have shortcomings from a climate monitoring perspective, as there is no institutional obligation

to long-term observations. In other cases, limited data analyses have been completed.

Resourcing of observation programmes

Funding for the marine data buoys, which make observations of water temperature, salinity and sea state, as well as some meteorological variables, is negotiated on an annual basis. Data Buoy M1 has been out of service for a significant period of time, and it is not clear when it will be redeployed.

Offshore measurements of salinity and nutrients are made by the Marine Institute-operated research vessels on a regular basis, however funding for these surveys is negotiated as part of the ship time fund, which is subject to change.

Observations of ocean acidification and surface and sub-surface currents have been made as part of short-term research projects. The lack of a long-term observation programme represents significant gaps in our observation network.

Phytoplankton are monitored in response to the EU's Water Framework Directive, however there is no programme in place to monitor them from a climate change perspective.

Limited analysis

There is an extensive tide gauge network in place, most of which is used for tidal predictions. The gauges operated by the Office of Public Works (OPW) at Malin Head Co. Donegal and at Castletownbere[2] Co. Cork conform to the Global Sea Level Observing System (GLOSS) standards and should be maintained for long-term sea level rise monitoring purposes.

A tide gauge has been present at Malin Head since 1958, however responsibility for the gauge has resided with a number of organisations over the years, including Ordnance Survey Ireland and OPW. Data from 1958 to 2001 is available via the British Oceanographic Data Centre's (BODC) Permanent Service for Mean Sea Level (PSMSL) facility. Data from 2004 is available from the OPW. It would be useful to collate the full Malin Head data record, carry out quality checks and determine the potential to analyse this data set for a sea level rise signal.

Satellite observations are available for a number of the variables (e.g. ocean colour, SST, salinity, sea level). However, no systematic analyses have been carried out on these from an Irish perspective.

Terrestrial

Terrestrial observations cover both the land and hydrological variables. In a number of cases, no systematic observation programmes exist, whilst in others, limited analyses of collected data have been carried out.

Observation programme

No specific observation programmes are in place for fire disturbance, soil carbon or water use. Estimates are made from proxy measures or models. In-situ soil moisture and LAI observations are made as part of ad-hoc research projects and are location specific.

Limited analyses

A number of variables are predominantly observed by satellite (e.g. Albedo, fAPAR, LAI). Limited analyses of these data have been carried out from an Irish perspective.

Systematic observation programmes for climate purposes of river flows, lake levels and ground water are being established. Limited analyses of lake level and ground water data have been carried out to date.

[2] Incorrectly specified as Castletownsend in the Climate Status Report

Key information and data sources

The tables below, Tables 2, 3 and 4, list the main organisations that possess relevant information and observational data on the ECVs of interest to Ireland. This is a non-exhaustive list. Additional sources can be found in "The Status of Ireland's Climate, 2012".

In some cases, information, and in particular analyses, may be available from other sources, including published reports and literature. *The naming of a source or contact point in this table does not necessarily assign responsibility to that body or person. It is for information only.*

Atmosphere

Table 2. Key sources and contact points for atmospheric ECVs.

Variable	Sources	Contact Point
Surface Temperature, Precipitation, Pressure, Surface Wind, Water Vapour, Surface Radiation, Upper Air Temperature and Wind	Met Éireann	Séamus Walsh
Cloud Properties	Met Éireann	Séamus Walsh
	C-CAPS, Schools of Physics, NUIG	Colin O'Dowd
CO_2	LSCE	Michel Ramonet
	World Data Centre for Greenhouse Gases: http://ds.data.jma.go.jp/gmd/wdcgg/ (hourly, daily and monthly observations from Mace Head)	
CH_4, Other GHG	Bristol University	Simon O'Doherty
	Advanced Global Atmospheric Gases Experiment: http://agage.eas.gatech.edu/data.html (monthly means from Mace Head)	
Total Column Ozone	Met Éireann	Keith Lambkin
	http://www.woudc.org/data_e.html (daily means at Valentia Observatory)	
Ground Ozone	Bristol University	Simon O'Doherty
	EPA	
	Mace Head Research Station, NUIG	Gerard Spain
Aerosols	Met Éireann	Keith Lambkin
	C-CAPS, Department of Physics, NUIG	Colin O'Dowd
	http://ebas.nilu.no (aerosol properties from Mace Head, Valentia Observatory and other sites)	

Oceans

Table 3. Key sources and contact points for oceanic ECVs.

Variable	Sources	Contact Point
Temperature, Salinity, Sea State, Currents, Ocean Colour, Phytoplankton, Nutrients	Marine Institute	Glenn Nolan
Acidification and CO2 Partial Pressure	Marine Institute	Glenn Nolan
	C-CAPS, Department of Physics, NUIG	Brian Ward
Sea Level	OPW	Peter Newport
	Marine Institute	Guy Westbrook
	POL	Phillip Woodworth
	http://www.psmsl.org/data/obtaining/ (monthly data from Malin Head, and Dublin)	
	https://www.bodc.ac.uk/data/information_and_inventories/gloss_handbook/ (data from the GLOSS sites at Malin Head and Castletownbere)	
Dissolved Oxygen	EPA	Shane O'Boyle

Terrestrial

Table 4. Key sources and contact points for terrestrial ECVs.

Variable	Sources	Contact Point
River Flow	EPA (http://hydronet.epa.ie)	Donal Daly
	NUI, Maynooth	Conor Murphy
	OPW (http://www.opw.ie/hydro/home.asp)	
Lake Levels	EPA (http://hydronet.epa.ie)	Deirdre Tierney
	OPW (http://www.opw.ie/hydro/home.asp)	
Groundwater	EPA	Anthony Mannix
	DCENR http://www.dcenr.gov.ie/Spatial+Data	
	GSI http://www.gsi.ie/Programmes/Groundwater	
Land Cover	EPA http://www.epa.ie/soilandbiodiversity/soils/land/corine/	Gavin Smith
Albedo, FAPAR	Various satellite-derived products	
Leaf Area Index	TCD	Matthew Saunders
Above Ground Biomass	EPA	Phillip O'Brien
Soil Carbon	EPA, Teagasc	

Soil Moisture	Met Éireann http://www.met.ie/agmet/default.asp	Séamus Walsh
	UCC	Gerard Kiely
Fire Disturbance	Met Éireann, Forest Service, Coillte	

Selected sources of other relevant information

The GCOS Implementation Plan: http://www.wmo.int/pages/prog/gcos/index.php?name=ClimateObservationNeeds

The Global Terrestrial Observing System: http://www.fao.org/gtos/topcECV.html

The Global Ocean Observing System: http://www.ioc-goos.org/

The Intergovernmental Panel on Climate Change: http://www.ipcc.ch/

Swiss National Climate Observing System: http://www.meteoschweiz.admin.ch/web/en/meteoswiss/international_affairs/gcos/uebersicht_klimabeobachtung/nationales_klimabeobachtungssystem.html

Climate Change Indicators in the United States: http://www.epa.gov/climatechange/science/indicators/

The State of the Climate, an annual report on global climate trends issued as a supplement to *the Bulletin of the American Meteorological Society:* http://www.ncdc.noaa.gov/bams-state-of-the-climate/

Vital Signs of the Planet: http://climate.nasa.gov/

Conclusions

A national climate status report, issued on a regular basis, is a key and necessary document that provides a succinct and accessible overview of the status of Ireland's climate observation system and the state of the climate itself. It highlights trends in key aspects of climate and provides useful baseline information that can assist in decision-making in regard to climate mitigation and adaptation actions. Furthermore, it assists with identifying those aspects of the observation system that are working well and areas that need attention. It can also help inform the regular national communications as part of the UNFCCC.

In compiling a Climate Status report, it is important that the process is as inclusive as possible and that all key stakeholders in national climate observations are engaged. Identifying appropriate data sources, sourcing and preparing data can take a significant amount of time and should not be underestimated. Based on the experience of compiling the first climate status report, the guidelines presented here should assist with streamlining the compilation of future reports.

Acronyms

BODC	British Oceanographic Data Centre
C-CAPS	Centre for Climate and Air Pollution Studies
CMRC	Coastal and Marine Research Centre
DCENR	Department of Communications, Energy and Natural Resources
DECC	Department of Energy and Climate Change
EC	European Commission
ECV	Essential Climate Variable
EPA	Environmental Protection Agency
ESA	European Space Agency
EU	European Union
fAPAR	fraction of Absorbed Photosynthetically Active Radiation
GCOS	Global Climate Observing System
GHG	Green House Gases
GLOSS	Global Sea Level Observing System
GSI	Geological Survey of Ireland
IPCC	Intergovernmental Panel on Climate Change
LAI	Leaf Area Index
LSCE	Laboratoire des Sciences du Climat et l'Environnement
NASA	National Aeronautics and Space Administration
NOAA	National Oceanic and Atmospheric Administration
NUIG	National University Ireland Galway
OPW	Office of Public Works
POL	Proudman Oceanographic Laboratory
PSMSL	Permanent Service for Mean Sea Level
TCD	Trinity College Dublin
UCC	University College Cork
UNFCCC	United Nations Framework Convention on Climate Change

AN GHNÍOMHAIREACHT UM CHAOMHNÚ COMHSHAOIL

Tá an Ghníomhaireacht um Chaomhnú Comhshaoil (GCC) freagrach as an gcomhshaol a chaomhnú agus a fheabhsú mar shócmhainn luachmhar do mhuintir na hÉireann. Táimid tiomanta do dhaoine agus don chomhshaol a chosaint ó éifeachtaí díobhálacha na radaíochta agus an truaillithe.

Is féidir obair na Gníomhaireachta a roinnt ina trí phríomhréimse:

Rialú: *Déanaimid córais éifeachtacha rialaithe agus comhlíonta comhshaoil a chur i bhfeidhm chun torthaí maithe comhshaoil a sholáthar agus chun díriú orthu siúd nach gcloíonn leis na córais sin.*

Eolas: *Soláthraímid sonraí, faisnéis agus measúnú comhshaoil atá ar ardchaighdeán, spriocdhírithe agus tráthúil chun bonn eolais a chur faoin gcinnteoireacht ar gach leibhéal.*

Tacaíocht: *Bímid ag saothrú i gcomhar le grúpaí eile chun tacú le comhshaol atá glan, táirgiúil agus cosanta go maith, agus le hiompar a chuirfidh le comhshaol inbhuanaithe.*

Ár bhFreagrachtaí

Ceadúnú

- Déanaimid na gníomhaíochtaí seo a leanas a rialú ionas nach ndéanann siad dochar do shláinte an phobail ná don chomhshaol:
- saoráidí dramhaíola (m.sh. láithreáin líonta talún, loisceoirí, stáisiúin aistrithe dramhaíola);
- gníomhaíochtaí tionsclaíocha ar scála mór (m.sh. déantúsaíocht cógaisíochta, déantúsaíocht stroighne, stáisiúin chumhachta);
- an diantalmhaíocht (m.sh. muca, éanlaith);
- úsáid shrianta agus scaoileadh rialaithe Orgánach Géinmhodhnaithe (OGM);
- foinsí radaíochta ianúcháin (m.sh. trealamh x-gha agus radaiteiripe, foinsí tionsclaíocha);
- áiseanna móra stórála peitril;
- scardadh dramhuisce;
- gníomhaíochtaí dumpála ar farraige.

Forfheidhmiú Náisiúnta i leith Cúrsaí Comhshaoil

- Clár náisiúnta iniúchtaí agus cigireachtaí a dhéanamh gach bliain ar shaoráidí a bhfuil ceadúnas ón nGníomhaireacht acu.
- Maoirseacht a dhéanamh ar fhreagrachtaí cosanta comhshaoil na n-údarás áitiúil.
- Caighdeán an uisce óil, arna sholáthar ag soláthraithe uisce phoiblí, a mhaoirsiú.
- Obair le húdaráis áitiúla agus le gníomhaireachtaí eile chun dul i ngleic le coireanna comhshaoil trí chomhordú a dhéanamh ar líonra forfheidhmiúcháin náisiúnta, trí dhíriú ar chiontóirí, agus trí mhaoirsiú a dhéanamh ar leasúchán.
- Cur i bhfeidhm rialachán ar nós na Rialachán um Dhramhthrealamh Leictreach agus Leictreonach (DTLL), um Shrian ar Shubstaintí Guaiseacha agus na Rialachán um rialú ar shubstaintí a ídíonn an ciseal ózóin.
- An dlí a chur orthu siúd a bhriseann dlí an chomhshaoil agus a dhéanann dochar don chomhshaol.

Bainistíocht Uisce

- Monatóireacht agus tuairisciú a dhéanamh ar cháilíocht aibhneacha, lochanna, uiscí idirchriosacha agus cósta na hÉireann, agus screamhuiscí; leibhéil uisce agus sruthanna aibhneacha a thomhas.
- Comhordú náisiúnta agus maoirsiú a dhéanamh ar an gCreat-Treoir Uisce.
- Monatóireacht agus tuairisciú a dhéanamh ar Cháilíocht an Uisce Snámha.

Monatóireacht, Anailís agus Tuairisciú ar an gComhshaol

- Monatóireacht a dhéanamh ar cháilíocht an aeir agus Treoir an AE maidir le hAer Glan don Eoraip (CAFÉ) a chur chun feidhme.
- Tuairisciú neamhspleách le cabhrú le cinnteoireacht an rialtais náisiúnta agus na n-údarás áitiúil (m.sh. tuairisciú tréimhsiúil ar staid Chomhshaol na hÉireann agus Tuarascálacha ar Tháscairí).

Rialú Astaíochtaí na nGás Ceaptha Teasa in Éirinn

- Fardail agus réamh-mheastacháin na hÉireann maidir le gáis cheaptha teasa a ullmhú.
- An Treoir maidir le Trádáil Astaíochtaí a chur chun feidhme i gcomhair breis agus 100 de na táirgeoirí dé-ocsaíde carbóin is mó in Éirinn

Taighde agus Forbairt Comhshaoil

- Taighde comhshaoil a chistiú chun brúnna a shainaithint, bonn eolais a chur faoi bheartais, agus réitigh a sholáthar i réimsí na haeráide, an uisce agus na hinbhuanaitheachta.

Measúnacht Straitéiseach Timpeallachta

- Measúnacht a dhéanamh ar thionchar pleananna agus clár beartaithe ar an gcomhshaol in Éirinn (m.sh. mórphleananna forbartha).

Cosaint Raideolaíoch

- Monatóireacht a dhéanamh ar leibhéil radaíochta, measúnacht a dhéanamh ar nochtadh mhuintir na hÉireann don radaíocht ianúcháin.
- Cabhrú le pleananna náisiúnta a fhorbairt le haghaidh éigeandálaí ag eascairt as taismí núicléacha.
- Monatóireacht a dhéanamh ar fhorbairtí thar lear a bhaineann le saoráidí núicléacha agus leis an tsábháilteacht raideolaíochta.
- Sainseirbhísí cosanta ar an radaíocht a sholáthar, nó maoirsiú a dhéanamh ar sholáthar na seirbhísí sin.

Treoir, Faisnéis Inrochtana agus Oideachas

- Comhairle agus treoir a chur ar fáil d'earnáil na tionsclaíochta agus don phobal maidir le hábhair a bhaineann le caomhnú an chomhshaoil agus leis an gcosaint raideolaíoch.
- Faisnéis thráthúil ar an gcomhshaol ar a bhfuil fáil éasca a chur ar fáil chun rannpháirtíocht an phobail a spreagadh sa chinnteoireacht i ndáil leis an gcomhshaol (m.sh. Timpeall an Tí, léarscáileanna radóin).
- Comhairle a chur ar fáil don Rialtas maidir le hábhair a bhaineann leis an tsábháilteacht raideolaíoch agus le cúrsaí práinnfhreagartha.
- Plean Náisiúnta Bainistíochta Dramhaíola Guaisí a fhorbairt chun dramhaíl ghuaiseach a chosc agus a bhainistiú.

Múscailt Feasachta agus Athrú Iompraíochta

- Feasacht chomhshaoil níos fearr a ghiniúint agus dul i bhfeidhm ar athrú iompraíochta dearfach trí thacú le gnóthais, le pobail agus le teaghlaigh a bheith níos éifeachtúla ar acmhainní.
- Tástáil le haghaidh radóin a chur chun cinn i dtithe agus in ionaid oibre, agus gníomhartha leasúcháin a spreagadh nuair is gá.

Bainistíocht agus struchtúr na Gníomhaireachta um Chaomhnú Comhshaoil

Tá an ghníomhaíocht á bainistiú ag Bord lánaimseartha, ar a bhfuil Ard-Stiúrthóir agus cúigear Stiúrthóirí. Déantar an obair ar fud cúig cinn d'Oifigí:

- An Oifig Aeráide, Ceadúnaithe agus Úsáide Acmhainní
- An Oifig Forfheidhmithe i leith cúrsaí Comhshaoil
- An Oifig um Measúnú Comhshaoil
- An Oifig um Cosaint Raideolaíoch
- An Oifig Cumarsáide agus Seirbhísí Corparáideacha

Tá Coiste Comhairleach ag an nGníomhaireacht le cabhrú léi. Tá dáréag comhaltaí air agus tagann siad le chéile go rialta le plé a dhéanamh ar ábhair imní agus le comhairle a chur ar an mBord.

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Climate Status Report Compilation Guidelines

Report Author: Ned Dwyer, The Coastal and Marine Research Centre, University College Cork

The aim of this report is to give guidance on the compilation of a periodic climate status report, based on the experience of compiling "The Status of Ireland's Climate 2012"

Identifying Pressures

The availability of high-quality climate observations is a critical starting point from which an understanding of past and emerging trends in the current climate can be developed. Such observations are vital for detecting change and providing the information needed to help manage and plan for the future in a wide range of socio-economic sectors. By providing periodic updates on the state of Ireland's climate , it will be possible to highlight improvements or shortcomings of the observation systems and raise awareness of trends and change in the climate itself.

Informing Policy

Observations are essential to help build robust projections of future climate, which can in turn inform policy formulation for appropriate mitigation and adaptation measures. Such measures should help us limit the negative socio-economic impacts and position us to take advantages of opportunities offered by a changing climate. Regular updates on the state of the observation systems and the climate itself are vital to ensure that appropriate policy measures are being put in place to address responses to climate change

Developing Solutions

As important as systematic collection and management of climate data is their regular analyses and the reporting of status, trends and projections. This report provides guidance on how to compile and present the relevant information on our climate and the observation systems which can help us improve our planning for the future under a changed climate.

Comhshaol, Pobal agus Rialtas Áitiúil
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