Brisbane's Plan For Action on Climate Change and Energy

Introduction

Scientists agree that climate change is occurring worldwide. The expected increases in climate variability, the higher temperatures and greater extreme weather will pose significant challenges for Brisbane. Increasing energy prices will also impact on businesses and the community. Local governments such as Brisbane City Council are in key positions to respond to these challenges.

Brisbane City Council's response is the *Plan for Action on Climate Change and Energy*. This plan is based on recommendations made by the independent Climate Change and Energy Taskforce commissioned by Council. To ensure the successful implementation of the *Plan for Action*, Council will partner and work with the Commonwealth and State Governments, the community, business and industry to make deep and meaningful cuts in Brisbane's greenhouse emissions.

The Council will continue its successful approach of **avoiding** taking actions that produce or increase greenhouse gas emissions in the first place; then **abating** or reducing, our contribution to greenhouse gas emissions. We will also **adapt** to climate change by ensuring the opportunities, such as new "green" businesses and industries are maximised and the negative impacts (from storms, flooding and heatwave) are minimised. Where we can't avoid or abate our greenhouse emissions we will **offset** them by reducing emissions elsewhere through initiatives such as planting trees to absorb and store carbon dioxide.

Background

In August 2006, Brisbane City Council set up the Climate Change and Energy Taskforce. Its aim was to advise Council on how to prepare and respond to the challenges of:

- climate change
- increasing energy consumption
- · rising petrol prices
- peak oil (when the global supply of oil begins to fall)

The Taskforce was an independent body and its members included Professor Ian Lowe (chairperson), John McEvoy, Jim McKnoulty, Patrice Derrington (retired from Taskforce), and Scott Losee.

The final taskforce report, *Climate Change and Energy Taskforce Final Report: A Call for Action*, was presented to Council's Establishment and Coordination Committee on 12 March 2007. This report included some 31 recommendations across eight strategy areas. It was decided that full Council would debate the final taskforce report at a special meeting on 30 April 2007 and agree on the recommendations to be adopted.

Community Feedback Received

Prior to the finalisation of the Taskforce report (September 2006):

On behalf of the Taskforce, Council established an online forum to provide an opportunity for the public to contribute ideas for consideration by the Taskforce. The website received 69 postings. Community input focussed on reducing greenhouse gas emissions. These comments were considered by the Taskforce and contributed to the recommendations included in their report.

After the release of the Taskforce report (April 2007)

In April 2007, prior to the debate the final Taskforce report was posted on Council's website. The webpage included an online community discussion forum and email address to enable community members to provide comments on the report before the debate. The online discussion forum received 22 comments and there were 10 emails received. Key points raised in the comments were that action should be taken now. The majority of people commended Council for taking action and leadership and there was strong support for the recommendations. All comments received were given to the Councillors.

A Plan For Action

The special meeting of Council was held on 30 April 2007 and the final taskforce report was debated. The majority of recommendations in the report had bipartisan support and were adopted by Council. These recommendations now form Council's *Plan for Action on Climate Change and Energy*. They show the direction Council will be taking to respond to climate change and energy conservation.

The *Plan for Action* is available on Councils website at www.brisbane.qld.gov.au/climatechange. It should be read in conjunction with the final taskforce report, which provides context to the recommendations and actions.

Implementation of the Plan for Action on Climate Change and Energy

Over the coming months, Council officers will be developing implementation plans for some of the recommendations and, at the same time, implementing others. Some actions will require whole new projects while others will be dealt with as part of existing Council planning and operational processes.

The community now has an opportunity to provide feedback on the *Plan for Action* and to provide comments that will help Council officers with the future delivery the recommendations and actions. Future opportunities for community feedback may also arise as part of the implementation of specific projects.

30-day public consultation period

Council is undertaking a 30-day public consultation period from 1 June 2007 to 30 June 2007 to seek community:

- comment on the recommendations adopted by Council *Plan for Action on Climate Change and Energy*; and
- suggestions which may assist Council officers to implement the recommendations and actions.

Submissions can be submitted by emailing comments to climatechange@brisbane.qld.gov.au or posting them to:

Brisbane City Council GPO Box 1434 Brisbane QLD 4001

Attention: Sustainability Team

An online discussion forum has been established to allow the community to share their thoughts with Council and other interested people at www.brisbane.gld.gov.au/climatechange

At the closure of the 30-day consultation period, Council's Establishment and Coordination Committee will be briefed on all comments received.

Leadership and Partnering

Action 1

Council reaffirms its commitment to the Greenhouse reduction target in the Living in Brisbane 2026 document, and that Council officers are asked to provide recommendations for 2012 reduction targets for homes and commercial premises.

Action 2

Council should lead by example and use its position of leadership to influence others to follow in meeting the challenges of climate change and peak oil, particularly through the Council of Mayors and by developing partnerships with a wide range of business, industry and community groups.

Action items:

- a) Work towards gaining AGO 'Greenhouse Friendly' certification for Brisbane Water, Brisbane Transport and other Council business units;
- b) Extend Greenhouse Friendly certification regionally to all SEQ water and transport authorities;
- Establish a Climate Partnership program similar to the Seattle program (a voluntary pact among Seattle-area employers to take action to reduce their own emissions, and to work together to help meet the community-wide goal), but connecting to the Australian Government's Greenhouse Challenge program and extending it region-wide;
- d) Develop a strong working relationship with the Green Building Council and ASBEC (e.g. ensuring Council officers have time to actively participate), to ensure rating tools are relevant to SEQ and effective.

Action 3

Develop partnerships with the Queensland and Commonwealth Governments to achieve policy changes.

Priorities for State policy change include:

- Establishing and empowering a clear lead agent for State Government leadership on climate change;
- b) Creating a State round table for sustainability, including responsibility for climate change and peak oil adaptation;
- c) Funding adaptation measures such as relocation of buildings and infrastructure from high risk areas as necessary;
- d) Reducing the carbon intensity of electricity generation;
- e) Supporting the CitySmart Regional Carbon Sink by committing agencies to use the greenhouse offset mechanism, and providing technical and legislative support as necessary;
- f) Providing incentives for fuel efficient vehicles;

- g) Further strengthening building code requirements for energy efficiency and sustainability and extending them to multi-unit development and existing homes; and
- h) Accelerating the move towards efficient public lighting.

Priorities for advocacy to the Commonwealth Government include:

- a) Establishing a National Sustainability Commission reporting to a senior minister;
- b) Recognising heatwave hazard as a Natural Disaster event;
- c) Fixing tax arrangements for vehicles that currently serve to encourage fuel wastage and remove tax and other barriers impeding adoption of biofuels;
- d) Incorporating sustainability and enhanced weather protection provisions into the Building Code of Australia and plumbing codes for all classes of buildings;
- e) Increasing the Mandatory Renewable Energy Target and associated penalties; and
- f) Accelerating the phasing out of inefficient technologies from Australian markets.

Action 4

Direct Council officers via the normal planning process, Council will seek to capture the economic development opportunities that come with addressing the challenges of climate change and peak oil and make Brisbane a model of sustainable living; for example, by seeking to attract and retain sustainable industries (i.e. alternative water technology, biofuels, etc.)

Action 5

Council will invest in sustainable energy alternatives to power its own operations in significant and visible ways.

- a) Install solar PV and solar hot water panels on Council buildings and infrastructure, focusing on high-visibility locations;
- b) Expand Council's involvement in energy from waste (landfill and sewage methane and greenwaste);
- c) Explore with land owners and industry to have wind turbines installed in effective locations (e.g. coastal or elevated positions);
- d) Partner with electricity retailers to assist them in promoting green power products (e.g. an option for households and businesses to sign-up to green power prominently on their rates notices); and
- e) Set an average fuel efficiency requirement for all City Fleet passenger vehicles, including executive vehicles (e.g. 10 L/100 km), and reduce over time to less than 5L/100km by 2026.

Action 6

By 2012, Council will conduct an assessment of the implications of climate change and peak oil for all of its facilities and infrastructure

Action 7

Council should continue and strengthen its leadership in South East Queensland in increasing water security by planning for a future climate with less certainty about water availability.

- a) Identify opportunities within Council buildings to innovate and incorporate water efficiency and source substitution;
- b) Carefully track all Council water use through the Energy Information and Management System;
- c) Take the initiative with alternative water sources including recycled water, rainwater and greywater.

Decision making

Real change will require a fundamental shift in decision-making processes to ensure total integration of sustainability principles into Council decisions. Council accepts that changes are required in the mindset, thinking, planning and concentration in order for the City to succeed in addressing climate change and peak oil.

Action 8

Fully integrate sustainability into Council decision making processes at all levels and promote integrated and future-focussed decisions. Use available means of influence to focus the attention of Council staff and suppliers on sustainability, climate change and peak oil.

- a) Initiate discussions with the State regarding further embedding sustainability in local government legislation;
- b) Obtain decision support tools to enable staff at all levels to frame proposals and decisions in the context of sustainability and take into account climate change and peak oil;
- Plan for budget implications and provide mechanisms to ensure the future-focussed dimensions
 of decisions are effectively considered; and
- d) Incorporate sustainability into BCC's Corporate Values.

Communication and education

Community education and awareness raising will be cornerstones in Council's approach to responding to Climate Change and Peak Oil. A strong social fabric, preparedness through education and excellent communication will greatly enhance Brisbane's ability to cope with local changes, as well as contribute to a global solution to greenhouse pollution.

Communication and education will play important roles in:

- Developing robust approaches to dealing with climate change and peak oil by ensuring community involvement in the ongoing development of responses;
- Sharing information that is important for community members to know (e.g. about potential effects on property);
- Contextualising Council actions to build a shared understanding of the need for difficult decisions (e.g. water price increases or new regulations); and
- Undertaking social marketing activities to encourage or change specific behaviours.

Community education must form part of an integrated strategy and is not a substitute for necessary regulations or investments. Community education requires significant effort and sustained commitment, however it will only work as part of a suite of measures.

Action 10

Council will establish via the CitySmart Program a communication and branding program to communicate messages about sustainability, climate change, peak oil and other related issues in a holistic way.

Action items:

- Research baseline awareness and develop awareness and attitudinal targets for residents and undertake periodic surveys to track progress;
- b) Partner with other interested public and private sector groups to pool communication resources, ensure consistency of messages and maximise the value of communication;
- c) Consider television or radio advertising and leverage through media partnerships where this would maximise rather than restrict coverage; and

These activities should be linked to, and build on existing broader community initiatives.

Action 11

Council will undertake community-based social marketing efforts designed to achieve specific behaviour changes.

- d) Establish a calendar of monthly behaviour change messages to be promoted by public figures (i.e. the Lord Mayor, councillors, partners, etc.);
- e) Identify priority behaviours to be targeted and ensure they are related to the umbrella marketing campaign;

- f) Work with primary and secondary schools to enable them to participate and provide fun opportunities for school children to get involved; and
- g) Priority areas of behaviour to be targeted include:

Sun smart, heat stress, how to stay cool and increasing thermal comfort

Active travel and public transport use (reducing car dependence)

Enhanced water security for homes and businesses (i.e. greater efficiency and source substitution)

Emergency preparedness

How to save energy and water and reduce waste

Purchase of green power and greenhouse offsets.

Strategic and land use planning

Planners have been aware of the potential implications of climate change for some time, and some basic considerations have been included in planning schemes. Peak oil is a more recent consideration. On the surface, peak oil adds further weight to the arguments to favour public transport, walking and cycling. Beyond this, there are additional planning considerations including potentially isolated communities, stranded infrastructure and local food production.

Planners and councils have tended to think about climate change as a distant future issue, and less important than other pressing matters such as managing growth pressures. Now, not only is climate change more pressing, but it is clear that the decisions we make about urban form now, will survive decades into the future, in markedly different climatic conditions.

There are a variety of issues that require a planning response, including flood and storm surge exposure, provision of shade and weather protection and providing incentives for sustainable development.

An integrated solution that has the potential to provide community, economic and environmental benefits, are Transit-Oriented Developments (TODs) which can serve as mixed use urban villages. Council will use its land use planning powers to change the trend in Brisbane development towards more compact and mixed use development (featuring TODs) that is well integrated with public transport, cycling and walking networks.

Action 12

Council supports the concept of TODs delivered by the private sector.

Action Items:

- Council will ensure that TODs maximise sustainability in design including energy and water efficiency, rainwater harvesting and stormwater reuse and provide opportunities for urban agriculture; and
- b) Council will discuss infrastructure needs for TODs with the State Government.

Action 13

Council will account for climate change and peak oil in the upcoming major City Plan review and ensure that these planning instruments are used to their full potential for climate change and peak oil adaptation.

Action items:

a) Immediately develop a discrete package of interim amendments to City Plan that will upgrade the plan to address policy issues that are already well understood, such as:

Upgrade the Q100 flood level

Lobby the State Government for mandatory rainwater tanks or stormwater capture for commercial and industrial development

Enhanced stormwater and flood-related infrastructure requirements

The need for shade and weather protection

Encourage solar access for roofs and embedded electricity generation, especially cogeneration

Enhanced attention to walking and cycling planning and infrastructure in development

Higher quality and mandatory footpaths for all new development

The provision of bike lockers, showers and changing facilities

Greater integration of commercial development and public transport

Recognition for urban agriculture and Green Roofs.

- b) Ensure that infrastructure charges plans incorporate the full costs of infrastructure development, and then consider providing transparent incentives to encourage sustainable development (e.g. the Sustainable Development Incentives Policy);
- Increase the provision of shade and weather protection throughout the city with direct Council works (such as improved bus shelters and public spaces) and introduce City Plan amendments to influence new development;
- d) Encourage and actively promote urban agriculture and amend City Plan and Local Laws as necessary to reduce barriers to food production within the city;
- e) Place greater emphasis on integration of public transport systems with key destinations including open space; and
- f) Establish a policy of no net loss of vegetation through development and require satisfactory compensatory planting for any clearing, including a net gain in vegetation cover, acknowledging that there may be some loss of existing vegetation, but this should be offset.

Sustainable transport

Transport is a vital consideration in addressing climate change and peak oil for three main reasons. First, Brisbane's current travel patterns rely heavily on oil, except for electrified trains (which are indirectly powered by coal), walking, cycling and natural gas vehicles (though natural gas production will also peak at some point). Second, transport involves hundreds of kilometres of infrastructure that, over its lifespan, will be subjected to future climates that are different than those for which they were designed and built. Third, greenhouse gas emissions from the transport sector are the fastest growing source of greenhouse emissions and difficult to reduce given the predominance of fossil-fuelled transport.

If we consider transport infrastructure as a total package, it is one of the greatest and most valuable assets of the city. We have an international and a regional airport, an important seaport, channels, streets, roads, freeways, bridges, tunnels, footpaths, bikeways, boat harbours, rail lines, streetlights, traffic lights, train signals and car parks. Building infrastructure to higher standards and facing escalating maintenance requirements will be a challenging issue for this city's future.

We have been aware for many years of the need to shift more of our trips to modes other than private vehicles (especially those occupied only by the driver). Council and the State and Federal governments have undertaken a series of important initiatives in these areas, such as busways and the extensive passenger rail network. Indeed, the *Brisbane 2026 Vision* goal is for 41 per cent of morning peak trips to be made by walking, cycling or public transport by 2026. Now, our awareness of peak oil and climate change have dramatically increased the urgency and importance of policies to move towards more sustainable transport, complemented by integrated land use planning. People's past reluctance to take more trips by public transport might change rapidly in the face of escalating oil prices or fuel rationing.

It is recognised that Brisbane has made improvements towards sustainable transport, but that Brisbane must now consolidate its commitment to ensuring that people and goods move by more sustainable means.

Action 15

Increase investment in public transport to achieve frequent, reliable, high quality, comfortable and attractive services. Plan ahead to provide the buses and public transport infrastructure and facilities needed to meet required increases in public transport patronage.

- a) Increase direct investment in comprehensive public transport for city and work closely with Translink to achieve the greatest effect for investment of public dollars;
- b) Establish busway services to Australia Trade Coast (ATC) employment destinations from the CBD (to complement Airtrain) and from likely settlement areas for ATC employees;
- Develop and follow an accelerated schedule for acquiring bus chassis and building buses, as well
 as ensuring parking, refuelling, staff and other facilities are ready. Liaise with QR and other
 operators to promote rapid acquisition of trains and buses;
- d) Assess the expansion of light or heavy rail services in the CBD to connect key points such as the Queen Street Mall and Fortitude Valley; and
- e) Design all new bridges and busways to accommodate potential future light rail.

Action 16

Council will take measures to ensure that walking and cycling can play an increasingly significant role as modes of transport, with investment in infrastructure that meets access and mobility needs with less fuel

Action items:

- a) Assign a high priority to making Brisbane more pedestrian friendly by:
 - Developing a Pedestrian Master Plan to create a comprehensive network of routes and paths that make walking easy and safe
 - Addressing shade, security and safety
 - Re-connecting footpaths that dead-end to the footpath network
 - Improving connectivity between destinations that are currently car-focussed, such as large shopping centres
 - Accelerating investment in footpath development and maintenance, focusing on quality and connectivity
 - Raising the standard of footpaths (e.g. width, vertical alignment, energy-efficient lighting).

In the next five years, Council will:

- b) Conduct 'pedshed' analyses of walking access within one kilometre of all major public transport stops and stations in Brisbane. Implement improvements identified through the analyses;
- c) Review the status of Council's policy and planning for cycling to identify gaps in implementation and opportunities for enhanced effort, with particular attention to:
 - o The effectiveness and coverage of the integrated network of cycleways
 - Capacity in view of possible significant increases in bike traffic
 - Signage, lighting, safety and security
 - Connectivity between urban nodes
- d) Incorporate cycling and walking paths with all new road and public transport infrastructure.

Action 18

Council will use travel demand management techniques to maximise the efficient use of transport infrastructure and provide price signals that reflect the social costs of travel to various locations at various times.

Possible strategies that the Council will consider include:

- a) Use a variety of techniques to spread peak hours including refined differential public transport fares,
- b) Investigate the role that libraries can play to support telecommuting and other means by which BCC can promote telecommuting (e.g. 'hives' with hot desk offices for rent, like internet cafés);

c) Expand community-based social marketing of public transport, walking and cycling;

Action 19

Council officers will investigate the feasibility of the following items:

- Give favourable planning and property rates support for alternative transport fuels refuelling networks (e.g. rates incentives for petrol stations depending on the number of fuel alternatives they provide: E10, B20, LPG, CNG, etc.);
- b) Buy light diesel passenger vehicles for City Fleet;
- c) Move immediately to a B20 biodiesel mix for all Council diesel uses;
- d) Move Council diesel vehicles to B100;
- e) Consider contractors' willingness to use available alternative fuels in procurement processes and set minimum biofuel use requirements as soon as feasible; and
- f) Following Council success with biofuels, identify the city's major diesel fleets and undertake an outreach program.

Action 21

In recognition of the economic risks associated with freight transport's reliance on diesel fuel, Council will encourage alternative thinking in the freight industry.

- a) Facilitate the efficient movement of freight and prevent stranded investments;
- b) Protect inter-modal freight terminals for future shifts to rail freight;
- c) Work with the Council of Mayors to protect food production in SEQ; and
- d) Support State and Federal government efforts to enhance the national rail freight network.

Preparedness for change, emergencies and surprises

Deliberate planning will help Brisbane cope with the changes it will experience due to climate change and peak oil. Council cannot achieve this on its own because it only has responsibility for part of the city's infrastructure and services. If Council is to be a leader on climate change, it needs to create a dialogue with other parties in the city who are in critical positions to influence how the city copes.

It is not possible to predict all the consequences that peak oil will have in Brisbane, nor the full range of effects of climate change. We have to expect that there will be surprises and emergencies. The best way to deal with these is to build greater community resilience, and establish strong channels of communication with the community.

It is recognised that Brisbane is considered a leader in disaster management planning. An ongoing and enhanced commitment to disaster management will be an essential component of Council meeting its obligations to protect its residents.

Action 22

Council will engage with owners and managers of critical infrastructure in the city and encourage them to address risk from climate change and peak oil.

Action items:

- a) Require forward planning for Council assets, especially water supply, wastewater treatment plants, stormwater, roads and bridges; and
- b) Communicate with major employers and significant businesses to advise them of Brisbane City Council's response to climate change and peak oil risks and encourage them to conduct contingency and forward planning.

Action 23

Enhance Council's commitment to disaster management and ensure that disaster management planning fully accounts for climate change related impacts.

Action items:

a) Establish flooding and storm surge response plans.

Diversification and conservation of natural resources

Diversifying Brisbane's sources of energy and water is an excellent way to build the city's resilience as it faces a more uncertain future with climate change and peak oil. For example, clean local electricity generation from renewable sources avoids transmission losses and contributes to greenhouse gas reduction, while also enhancing local self-sufficiency for power.

Council will apply the following order of priority, when reviewing options for energy supply and greenhouse reduction as follows:

- Enhance local energy security, reliability and self-sufficiency
- Rapidly decrease the carbon-intensity of energy sources
- Use carbon trading to offset residual fossil-fuel sourced energy.

People clearly have a better capacity to adapt to climate change than other living things. Development of Brisbane has reduced the pre-existing natural areas to only remnant vegetation. These remnants provide critical habitat for species, but the micro-climatic circumstances are now likely to change due to human-induced climate change. Council needs to reconsider the effectiveness of its biodiversity strategies in recognition of the implications of climate change.

Finally, water resources have risen to prominence due to the current drought. We have simultaneously realised that there have been pre-historical periods of greater drought in many areas of the world and that we are increasing the risk and intensity of drought through climate change. It is no longer tenable to waste water as much as we have. The Taskforce believes that Brisbane's successful adaptation to climate change depends heavily on its ability to manage water resources better than it ever has in the past.

Action 27

Proceed to develop the CitySmart Regional Carbon Sink in conjunction with the Council of Mayors and the State.

Action items:

- a) Ensure that carbon trading arrangements are compatible with the National Emissions Trading Taskforce, Commonwealth Government initiatives and the NSW program:
- b) Increase bushland reserves and connectivity between them as a vital component of the Regional Carbon Sink and to provide additional protection of natural areas from changing micro-climatic conditions;
- c) Investigate the vulnerability of significant local natural areas (e.g. wetlands) to climate changes;
- d) Balance carbon sequestration objectives with the need to retain viable local food production in view of peak oil implications for food accessibility.

Action 28

Build on the momentum of the current drought response to further drought-proof Brisbane for the long-term.

Strategies that Council will consider include:

- a) Recycling 100 per cent of wastewater by 2026 (as stated in the *Brisbane 2026 Vision*);
- b) Phasing-in significant increases in water price for business and residential customers over a notified period;
- c) Encouraging residents to remove all inefficient toilets, showers and washing machines from the city (in keeping with the *Brisbane 2026 Vision* that called for all households to be fitted with 5A water saving devices by 2026);
- d) Making the most feasible components of the BCC water sensitive urban design guidelines mandatory; and
- e) Actively promoting the use of grey water.

Action 29

Contribute to the introduction of alternative energy systems to reduce Brisbane's reliance on electricity from large-scale coal-fired power stations. This aligns with the *Brisbane 2026 Vision* that Brisbane's per capita energy use will be the lowest in Australia.

- a) Undertake an external review of energy efficiency opportunities for the Brisbane Water network;
- b) Develop an Energy Efficiency Management Plan system program to leverage off the interaction with businesses achieved through the Water Efficiency Management Plans; and
- c) Establish a mechanism to assist residences and businesses to install sustainable energy systems.

Research

The understanding of climate change and peak oil implications and adaptation is a relatively recent area of knowledge. Although Council is not traditionally a research body, it can play an invaluable role in focussing research activities on priority questions for the community. With so many unknowns, the city must invest effort in trying to understand and envision future urban systems that will be compatible with the challenges and constraints caused by peak oil and climate change.

Action 30

Seek input from research bodies and experts conducting research and development for issues directly relevant to Brisbane's response to climate change and peak oil.

Topics include, amongst other things:

- a) Understanding sea level rise and storm surge impacts on Brisbane;
- b) Life cycle analysis of local biofuel sources;
- c) Bio-fixation of fugitive methane emissions from closed landfills;
- d) Feasible means for adopting green roofs in Brisbane (e.g. roof top gardens and horticultural production);
- e) Expanding city farms to encourage local food production;
- f) Energy trade-offs with new water technology (e.g. water pumping and treatment for recycling or desalination are heavy consumers of electricity); and
- g) Sustainable construction materials for Council infrastructure (e.g. low embodied energy, low oil requirements, high recyclability).

Action 31

Provide sufficient resource and priority for annually tracking of key statistics to enable performance measurement of progress towards the goals identified in this action plan.

Performance measurements considered for inclusion:

- a) Updates of the greenhouse gas emissions inventories (and liaise with the State and SEQ councils to ensure these occur for the whole region);
- b) Updating transport statistics (e.g. mode share and vehicle kilometres travelled);
- c) Surveys of community attitudes and understanding; and
- d) Information about climate changes to support public education programs.