CATLIN

25 February 2010 Release 2010-4

SCIENTISTS AND EXPLORERS TEAM UP TO EXAMINE OCEAN ACIDIFICATION DURING CATLIN ARCTIC SURVEY 2010

LONDON – An international team of research scientists will investigate the potential effects of carbon dioxide on the Arctic Ocean as part of Catlin Arctic Survey 2010, officially announced today.

Polar explorer Pen Hadow, Director of the Catlin Arctic Survey, explained that the scientists will work from early March at a purpose-built 'Ice Base' located only 750 miles from the North Geographic Pole. The researchers will study the potential impact of increased ocean acidification in some of the coldest water on the planet.

Some scientists believe that, based on current projections, the pH of the world's oceans could reach levels by 2050 not seen on Earth for 20 million years. If this occurs, there could be serious consequences for marine life in the Arctic and elsewhere.

A second dimension of this year's Catlin Arctic Survey will see a team of experienced polar explorers trek up to 500 kilometres across the floating Arctic sea ice to collect scientific data in a region in which it would be unsafe for scientists to work. The Explorer Team's programme will include taking ice thickness measurements for sea ice modellers and samples of water taken from beneath the ice for the CO_2 and acidification programme.

Both teams will face the extreme conditions of the Arctic at this time of year which, with a wind-chill factor, could reach minus 75 degrees Celsius.

The Catlin Arctic Survey Ice Base will provide scientists with an opportunity to gain direct access to this unique but inhospitable environment. Research into environmental changes in the Arctic is hampered by the bitter conditions, especially in the winter and early spring. Whilst at the Ice Base, the participating scientists will carry out their research accompanied by veteran polar explorers and guides. The Ice Base will provide living, dining, research and communications facilities that scientists could not easily supply on their own.

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Catlin Group Limited, ('CGL': London Stock Exchange) the international specialty insurer and reinsurer, is sponsoring the Catlin Arctic Survey to allow scientists to obtain vital data that can be used to forecast more accurately the risks posed by our changing environment.

Pen Hadow described the Survey as an example of modern exploration: "Our aim at the Catlin Arctic Survey is to make it possible for science work to be undertaken that would otherwise be exceptionally difficult to do. The scientists will be able to work safely thanks to the skills of our polar support team, who will be guiding them out onto the floating sea ice. Our Ice Base will have all the facilities they need to conduct research and to survive in the extreme conditions of an Arctic winter and spring."

One of the scientists who will work at the Ice Base, Dr Helen Findlay of Plymouth Marine Laboratory, said: "I've been to the Arctic before, although not in winter, and it's a challenging place to carry out science. But, it is worth the effort to get first-hand, unique and important data that will help us understand changes in Arctic seas and how they may link to global systems."

The main thrust of the research to be conducted at the Ice Base is the study of increasing ocean acidification in the Arctic Ocean.

Dr Carol Turley of the Plymouth Marine Laboratory said: "We understand from models projecting future ocean chemistry that the Arctic Ocean is particularly vulnerable to ocean acidification because cold water absorbs CO_2 more effectively than warm oceans, so much so that it may become corrosive to some shelled organisms within a few decades."

Professor Jean-Pierre Gattuso of CNRS-Université Pierre et Marie Curie, whose researchers will work at Ice Base, said: "Ocean acidification is the 'other carbon dioxide problem'. The oceans absorb about a quarter of human-made CO_2. This has been limiting the amount of greenhouse gas in the atmosphere and mitigating climate change. However, the massive amounts of CO_2 absorbed considerably upsets the ocean chemistry by increasing the acidity of sea water. It is certain that it will impact marine ecosystems, although we do not fully understand how all marine species will cope at the levels of acidity projected later in this century."

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The Explorer Team – consisting of leading Arctic explorers Ann Daniels, Martin Hartley and Charlie Paton – will capture additional scientific data along a 500-kilometre trek northwards across the floating sea ice.

In 2009 Hadow, Daniels and Hartley trekked nearly 450 kilometres during the first Catlin Arctic Survey, taking more than 6,000 measurements of the floating sea ice. The data collected by the explorers was subsequently cited by University of Cambridge researchers as further evidence to support an emerging consensus that the Arctic Ocean will be ice-free during summers in around 20 years.

Daniels, who has already begun final preparations in northern Canada, says the Explorer Team's Arctic skills enable them to operate in locations where it would be unsafe for scientists to work. "It is unimaginably tough surviving and travelling on the floating sea ice. But as experienced surface explorers, we know what to do. The drilling work will produce more measurements of the sea ice thickness, continuing the work we began last year. The ocean water samples we take will be stored and returned for analysis for the acidification programme."

The academic institutions participating in the Catlin Arctic Survey 2010 include CNRS-Université Pierre et Marie Curie, Laboratoire Oceanographie (Villefranche); Plymouth Marine Laboratory; Institute of Ocean Science (Fisheries and Oceans Canada); University of Exeter; and Bangor University. An international group of scientists based in Europe, Canada and the USA will also be able to use the results of the field studies.

Stephen Catlin, chief executive of Catlin Group Limited, said: "Catlin is extremely pleased to sponsor the Catlin Arctic Survey. It is clear that climate change and ocean change pose serious implications for the future of our planet. Our sole purpose in sponsoring the Survey is to ensure that researchers can obtain scientific facts about these changes so that they can make more reliable conclusions about our future."

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Notes to editors:

1. Further information about the Catlin Arctic Survey is available at www.catlinarcticsurvey.com. A fact sheet is attached to this release.~

2. High-resolution photos are available from www.catlinarcticsurvey.com/press.aspx. Access passwords can be obtained by calling the media team.

3. Catlin Group Limited, headquartered in Bermuda, is an international specialist property/casualty insurer and reinsurer writing more than 30 classes of business worldwide through six underwriting hubs. Gross premiums written in 2009 amounted to more than US$3.7 billion.

4. Catlin shares are traded on the London Stock Exchange (ticker symbol: CGL). More information about Catlin can be found at www.catlin.com.

5. Catlin has established operating hubs in London, Bermuda, the United States, the Asia-Pacific region, Europe and Canada. Through these hubs, Catlin works closely with policyholders and their brokers. The hubs also provide Catlin with product and geographic diversity. Altogether, Catlin operates 47 offices in 20 countries.

6. Catlin's underwriting units are rated 'A' by A.M. Best and Standard & Poor's.

CATLIN ARCTIC SURVEY 2010

FAST FACTS

ICE BASE

- Seven ocean acidification scientists will work at the Ice Base
- They will represent Plymouth Marine Laboratory; NRS-Université Pierre et Marie Curie, Laboratoire Oceanographie (Villefranche); University of Exeter; Bangor University; and Institute of Ocean Science, (Fisheries and Oceans Canada)
- The Ice Base is situated at Isachsen, a small station situated on the western shore of Ellef Rignes Island in the Sverdup Islands, in the territory of Nunavut in Canada
- The scientists will be undertaking seawater sampling at different points on the sea ice. These will undergo analysis both at the Ice Base and back at their participating institutions
- Additional data analysis will be undertaken after the Ice Base closes by the University of Cambridge, the University of Edinburgh and the University of British Columbia

EXPLORER TEAM

- The Explorer Team will trek up to 500km in approximately 55 days in temperatures as low as -45ºC (with a wind-chill factor of -75ºC) in the early stages
- The team will average between 8-10km a day, pulling sledges weighing up to 120kg
- Hazards include: polar bear attacks, thin ice, open water, ice ridges, rubble-fields, fog, blizzards and carbon monoxide poisoning from cooking inside the tent
- The explorers may have to swim for up to 25 hours during the journey in water as cold as -1.8ºC
- They will be consuming over 6,000 calories per day, more than twice those used by a fairly active person under normal conditions, and the equivalent of six traditional English cooked breakfasts
- Despite this, the explorers can still expect to lose between 5-10kgs in weight during their journey

THE IMPORTANCE OF THE GLOBAL OCEANS

- Covering 71% of the Earth's surface, the oceans comprise 97% of the planet's total stock of water
- They provide habitats for biodiversity, playing host to almost 50% of known species, and supporting the life of an estimated 80% of all sea-, sky- and land-dwelling creatures
- They provide one-fifth of the animal protein in human diets, over one in three people of the entire planet's population live in coastal areas and they contribute to the livelihood of hundreds of millions of people
- There are also billions of tiny single-celled plants floating around in our seas that contribute around 50% of the total oxygen in our biosphere, which, together with our rainforests on land, act as the lungs of our planet
- The oceans also play a vital role in regulating how heat from the sun is redistributed around the planet, which in turn drives the weather patterns and the climate in many areas

THE ARCTIC

- The Arctic Ocean is the world's smallest ocean, roughly 8% the size of the Pacific Ocean
- Yet more fish live along the edges of the Arctic Ocean than anywhere else on Earth
- The High Arctic is a polar desert, the coldest and driest landscape in the Arctic area. It gets only around 8 inches of rain in a year
- The lowest world temperature in inhabited areas was recorded in the Arctic. The temperature plunged to -90.4°F / -68°C in both Oymyakon, Siberia (6 February 1933) and Verkhoyansk, Siberia (3 January 1885)
- The Explorer Team and Ice Base can expect to experience temperatures as low as -45°C (with a wind-chill factor of as low as -75°C)
- The iceberg that sank the Titanic was a huge chunk of Arctic sea ice

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THE ARCTIC OCEAN SEA ICE

- By 2030-40, there is a significant probability that the white 'North Pole ice', one of our planet's defining year-round surface features as viewed from space, will have been transformed into an entirely blue, open ocean during summers.
- The Arctic Ocean is expected to become more acidic as the sea ice melts and more cold, open waters are exposed to CO_2 absorption
- At its fullest extent, the sea ice covers almost three per cent of the Earth's surface and reflects approximately 80% of incoming solar energy – its loss would allow 70% more of the sun's energy to be absorbed by the Earth's surface in this region
- An estimated 25% of the Earth's known remaining oil and gas reserves lie under the Arctic Ocean's seabed
- The increasingly large areas of open water in the Arctic Ocean absorb more heat, meaning its volume expands. This contributes to global rising sea levels
- Current predictions suggest that global sea levels may well rise by between 30-100cm by 2100, leaving potentially 300 million people in danger of flooding
- A rise of between 8cms and 30cms could lead to Indonesia losing up to 2,000 of its 17,508 islands

OCEAN ACIDIFICATION

- When CO_2 dissolves in seawater, it forms carbonic acid, thereby acidifying the ocean
- Although this reaction is independent of climate change, as more CO_2 enters the atmosphere, so more is likely to be absorbed by the oceans
- The impacts of this ocean acidification are only just starting to be understood, but this could have many repercussions for life both in, and beyond, the seas
- In particular, acidification of seawater reduces the availability of a mineral called carbonate. This mineral is used by a number of marine organisms to form their shells, skeletons and armour-plating in a process called 'calcification'
- A reduction in calcification has an effect similar to osteoporosis in humans, slowing growth and making shells and skeletons weaker in many organisms exposed to these conditions. This could have an impact on species such as lobsters, crabs, mussels, oysters and sea urchins
- At particular risk are microscopic marine organisms with delicate calcium carbonate shells

MICROSCOPIC MARINE LIFE

- Plankton is the 'marine soup' that accounts for some of the smallest living creatures on Earth. It contains both plants and animals which, whilst most people have never heard of them, form a vital part of the food web
- Planktonic plants (known as phytoplankton) convert huge quantities of inorganic CO_2 into living matter in a process known as 'primary production'. This is the interface where life is created in the oceans, and the process releases around 50% of the world's oxygen into the atmosphere, making phytoplankton vital for life outside of the oceans
- Through primary production, death and sinking, phytoplankton effectively transport carbon from the ocean's surface layer to marine sediments, a process by which they exert a global-scale influence on ocean currents and climate
- Planktonic animals (known as zooplankton) include pteropods. Also known as sea butterflies, pteropods are tiny lentil-sized marine snails that form a fundamental food source for many marine creatures. Their loss could have a catastrophic effect on the marine food web and the food supply of millions of people
- Little is known about the behaviour of sea butterflies, but they are known to have a peculiar way of feeding. Sometimes they entangle planktonic food through a mucous web that can be up to 5 cm wide, many times larger than themselves
- Apart from bacteria, planktonic organisms are the most abundant life form on earth. The weight of all the plankton in the oceans is greater than that of all the dolphins, fish and whales put together