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## Casey: the Daintree of Antarctica

Dana Bergstrom  
*Australian Antarctic Division*

Sharon A. Robinson  
*University of Wollongong, sharonr@uow.edu.au*

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## Casey: the Daintree of Antarctica

### Abstract

Antarctica is at the edge of life on the planet. Less than 0.5% of the Antarctic continent is ice-free rock or soil and therefore only tiny pockets of land are available for plants to establish. The Australian Antarctic Territory is home to some of the rarest ecosystems on the planet and the plant life at Casey is as good as it gets - Casey has the most extensive and best developed plant communities in continental Antarctica: it is the 'Daintree' of Antarctica. The largest plants are the mosses and they are like miniature old growth forests, growing incredibly slowly. A single moss shoot may be over 100 years old. Very few plants can cope with Antarctic conditions which is why the Casey vegetation is so special.

### Disciplines

Life Sciences | Physical Sciences and Mathematics | Social and Behavioral Sciences

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## Casey: the Daintree of Antarctica

### Why is Casey special?

Antarctica is at the edge of life on the planet. Less than 0.5% of the Antarctic continent is ice-free rock or soil and therefore only tiny pockets of land are available for plants to establish. The Australian Antarctic Territory is home to some of the rarest ecosystems on the planet and the plant life at Casey is as good as it gets - Casey has the most extensive and best developed plant communities in continental Antarctica: it is the 'Daintree' of Antarctica. The largest plants are the mosses and they are like miniature old growth forests, growing incredibly slowly. A single moss shoot may be over 100 years old. Very few plants can cope with Antarctic conditions which is why the Casey vegetation is so special.

Climate change has produced drying and warming in the east Antarctic region. The ozone hole has also elevated UVB radiation over the entire continent. Casey ecosystems can provide us with a valuable sentinel to measure the impact of climate change.

### What plants are in the Casey region?

The plants at Casey can be divided into three groups:

#### 1. Mosses and liverworts

During evolution mosses and liverworts were among the first plants to inhabit the land. Unique characteristics enable them to survive drying and freezing. Although mosses are really tough, they can only grow in the relatively wet areas around melt lakes and streams. Small moss patches also inhabit cracks in rocks and other sheltered areas where melt water is available. Melt of ice comes with the return of the sun in spring. Mosses and liverworts together form the group of plants called bryophytes. There are three species of moss in the Casey area – *Schistidium antarctici* (a species found only in Antarctica); *Bryum pseudotriquetrum* and *Ceratodon purpureus* (species that are found across the world) – and one liverwort, thread-like *Cephaloziella exiliflora*.

#### 2. Lichens

Lichens can grow on most surfaces found in the Casey region (for example rocks, soil and also on mosses) and can absorb water from the air. Like mosses, lichens can survive long periods of desiccation. They can survive in very dry areas and are therefore widely distributed. Lichens are even found on exposed rocks within 500km of the South Pole.

#### 3. Terrestrial and snow algae

These plants belong to the same group as seaweeds. They are found in the nutrient rich areas around penguin colonies. Terrestrial algae thrive in the salty coastal areas where mosses and lichens cannot grow. *Prasiola crispa* (a species of terrestrial alga) grows as a green mat and looks like sea lettuce.

Snow algae are similar to the algae that cause blooms in river and marine systems. They are colonies of microscopic algae, which reproduce rapidly in the snow when nutrient and temperature conditions are right.

### What animals are in the Casey ecosystem?

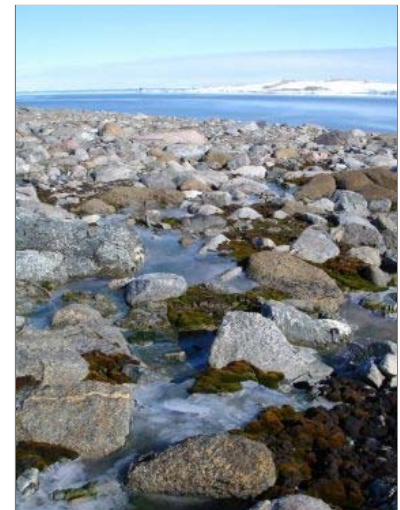
The Casey region is home to colonies of Adelie penguins, snow petrels and Weddell and elephant seals. Most moss beds are the sites of abandoned ancient penguin colonies and these sediments provide nutrients for the plants to grow - a ready supply of ancient fertiliser. Although no large animals rely on moss for food, moss is home to many very small animals (invertebrates).

### Studying the impact of climate change at Casey

A collaborative team of researchers from the Australian Antarctic Division, University of Wollongong, University of Tasmania, Australian National University and the University of Melbourne are currently studying the influence of climate change and human impacts on the Casey moss beds.

### More information

- Project information on University of Wollongong website
- Unmanned aerial vehicle Antarctic moss bed case study
- Understanding the tolerance of Antarctic mosses to climate change



Mosses emerging from a spring melt (Photo: Sharon Robinson)



Snow algae in ice cliff  
Photo: Sharon Robinson