

## Antarctica

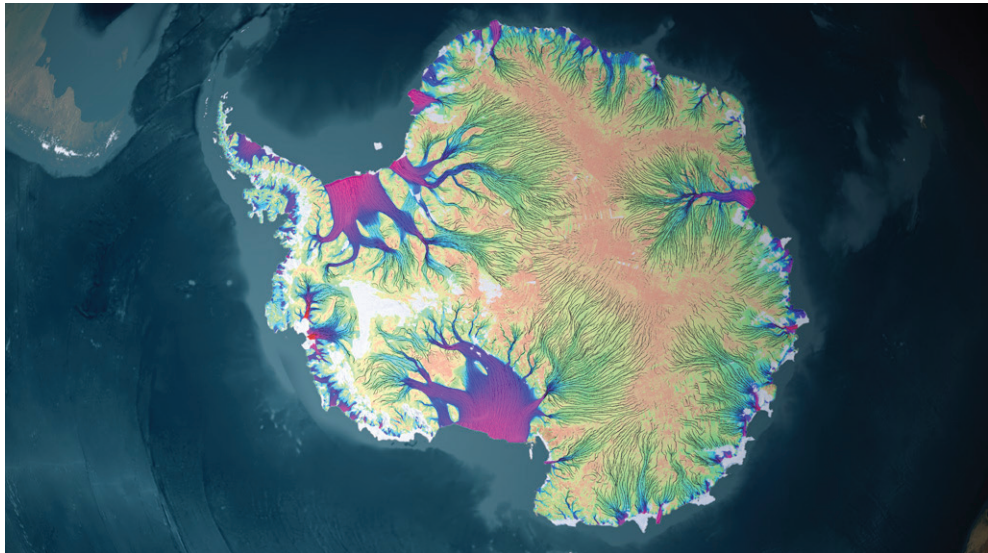


Figure 1. *Antarctica Ice Flow Charted from Space/Differentially-Scaled Ice Velocity*. NASA/Goddard Space Flight Center, Scientific Visualization Studio, Trent Schindler, Lead Animator, 18 August 2011.

Antarctica is the vast continent at the bottom of the world. It is extremely isolated, not only geographically, by its distance from any other land mass, but also because of its long dark winter, cold temperatures, ice covered landscape, snow storms and driving winds. I have always been curiously drawn towards it. There is so much to discover and explore in a space still relatively unknown.

I worked with Professor Christina Hulbe, Dean of the Otago University School of Surveying, for the Art and Space Project. Christina is conducting research on the Polar Ice sheets, on the changes that have occurred in the past and those that are happening now.<sup>1</sup> Her recent work is based on the Ross Ice Shelf in Antarctica. She is the lead scientist in an international team in a New Zealand Antarctic Research Institute-funded programme that is examining the history of the stability of

the shelf. The ice shelf is a floating extension of the West Antarctic Ice Sheet and is vulnerable to climate change. The project involves drilling through the shelf to observe the ice, the hidden ocean beneath and drilling into the sediment below to determine its condition and stability.<sup>2</sup> This gives some insight into how the ice shelf has acted previously, and how it will behave in the future, as the earth continues to warm and becomes affected by the greater rate of climate change. I found this research concept fascinating and started thinking of how looking into the past, seeing beneath the surface, can enable insights into the future.

When Christina introduced me to her work, I became aware of the importance of mapping. It is where our understanding begins by looking and studying contemporary maps of Antarctica. These maps are produced from space, directly above the continent, using a range of wavelengths to give multiple views of the surface of Antarctica, the land structure, the surface height, the temperature and its variation around the continent, the weather patterns. Repeated over and over, they become a time lapse of the land and its changes. These maps provide a framework of information that enable



Figure 2. Christina Hulbe, *The Ross Ice Shelf*.

scientists to analyse the patterns and natural systems around the continent. With the aid of a range of maps we can trace the ice flow, the forms and patterns that run in the ice as it moves. They show changes that are occurring in the ice over time that would otherwise be invisible to the naked eye. On the ice all you see is this vast white wilderness (space) that continually extends from where you stand. You can not appreciate the movement as the ice pushes its way forward, streaming slowly out towards the edge.

It was the movement of the ice that I found interesting, the way it causes changes in the ice sheet, what those changes are and why they occur, but also the significance they have had and might have in the future. Research is helping to inform us, through understanding the past, to discover what impact the world's climate has on the longevity of the ice shelves, with ocean levels rising and falling,



Figure 3. Sarah McKay, *Contained*, 2016, mixed media, glass, light, photography, 5 works, approx. 30cm x 30cm in surface dimensions but different heights, from 55cm to 115cm.

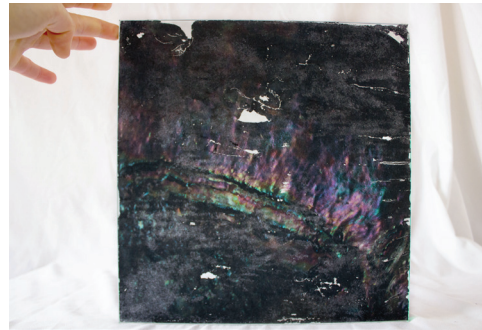


Figure 4. Sarah McKay, *Contained*, 2016, mixed media, glass, light, photography, detail of single glass plate.

with the ice shelves melting and freezing, and the speed and progression of the ice flowing out into the seas and oceans surrounding them. I discovered that the ice shelves have a certain fragility. As the thickness of the ice changes, due to the flow of ice, changing temperatures and shifting sea levels, the ice shelves, and Antarctica itself, are rendered unstable.

I think that Antarctica is one of the most beautiful places in the world. There seems to be nothing there but at the same time so much there. It has a romantic isolation that I've always wanted to experience. I want to feel the silence of it, knowing, at the same time, that it is never truly silent, that the land speaks. I love it because it is one of the few places that is almost untouched by the human world and I've always felt that this aspect of its isolation and location needs to be protected. It needs to stay removed from the human world, with its human presence limited to scientists and research teams,<sup>3</sup> and with everything done to minimise the effect of human interference on the continent. Antarctica has to exist in the way we know it now to give us a touchstone of truth about our world. Antarctica, being so removed from the rest of the world, holds the answer to what we are missing, what we need, and it needs to stay that way.

This is where the idea behind the individual stand-alone art pieces came from. It was that isolation and removal from any interaction with the human world, from everyone and everything around. Christina said that, in her own experience of Antarctica, she found a peacefulness that you could never photograph. That was something I wanted to be able show in the work to create the sense of its space, the dualities she spoke of, how it was both too big, but also felt small, that it was silent but full of the loudness of its own noise, how it was constantly in motion but a motion you do not feel, that is imperceptible as you stand there feeling as if you are going nowhere. I wanted to find a way to contain something that was expansive and incomprehensible, completely deceptive in scale and space.

Pieces that you look across the tops of but also have to look down into, a little like the ice and surface of Antarctica. I wanted them to have a nothingness, to be empty pillars when seen from a distance, until you approach them when they become something else, enticing. The different heights of the pillars were another way to engage people, of all ages, and to encourage them to physically interact with the pieces. When you approach the pillars you are obliged to stop, and to peer into the pillars and closely examine beneath the surface and beyond to the restricted depths. We see only a

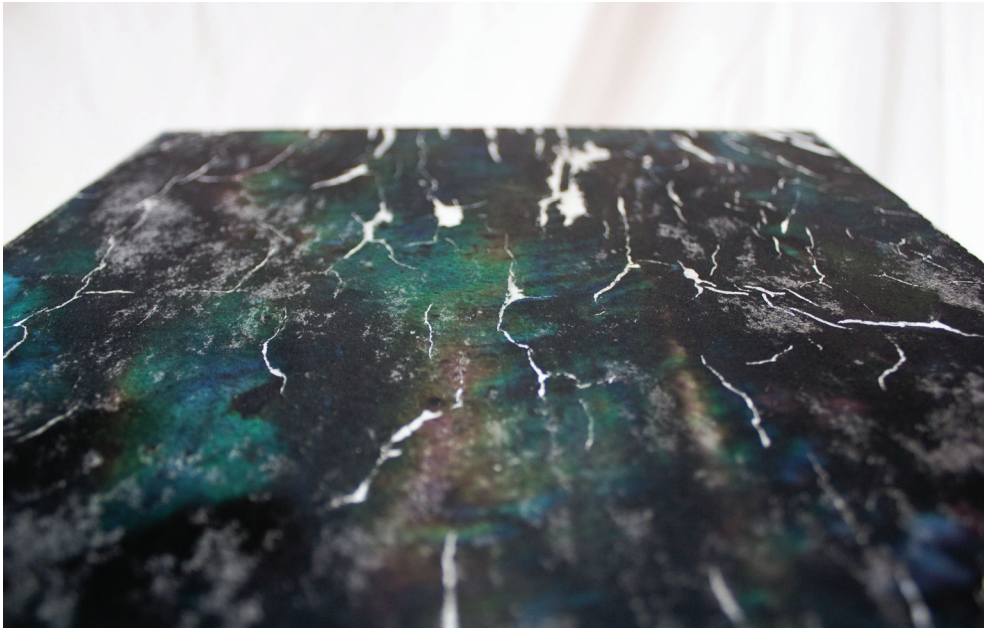


Figure 5. Sarah McKay, *Contained*, 2016, mixed media, glass, light, photography, detail of single glass plate.

fraction of what is actually there. The material within the pillars is based on the internal construction of a camera, in the way it works, what I can do to manipulate both the camera and the image; to find and locate an image that seems to have value, finding a link from the collective knowledge of past scientists' research to inform and develop the work done now to understand something that is continually in a state of becoming.

I used photographic images on the underside of the glass plates at the top of the finished pillars, and others inside the pillars at angles that descend to the base of them, reminding you of ice flow and descending depths. The photographic images are based on photographs of shells that I found washed up from the sea and left behind by the tide. I chose the shells because I wanted a direct link to the ocean, to the sediments and the sea floor, to show just how close this is to us all. The ice goes into the ocean, the ocean that is only metres away from land we call home. I submerged the shells in water to photograph them. The image is distorted by the effect of the water on the shells' inner surface, accentuated by the minimal amount of light that illuminates them only partially. The images resulted in enhancing the patterns of the shells' inner surface and created a sense of movement, of flow. The colours, patterns, textures and movement, refer back to the maps used by the scientists to represent the surface of the ice flows, the speed and the depth of the ice and water. The lights hidden at the bottom of the pillars illuminate the glass from below, allowing light to show through the photographs where they are washed away. The lights show all the cracks of the surfaces through the washed away parts of the images. In places where more light is able to penetrate, it represents the fragility of the ice as it disintegrates. The cracks that appear in the images come from the pressure applied to the glass during the process of transferring the image to the glass surface. Parts of the images disintegrated under pressure, and were further weakened when subject to a stream of water,



Figure 6. Sarah McKay, *Contained*, 2016, mixed media, glass, light, photography, detail of single glass plate.

some also sliding off the edge. I wanted that temporal element of the process to come through in the resulting image. The images will continue to disintegrate the more water affects their surfaces. In the end, these glass images, submerged in water will disappear, and like the ice shelf they will disintegrate, become nothing, not a trace left. They will no longer exist.

**Sarah McKay** graduated from the Dunedin School of Art with a Bachelor of Arts (Hons) in Photography and Electronic Arts in 2015.

**Christina Hulbe** (School of Surveying, University of Otago). I am a geophysicist who studies how and why polar ice sheets change over time. While I got my start in a remote west Antarctic field camp, most of my research today is computational, using mathematical models and remote sensing to investigate modern systems and the recent past.

1. University of Otago, Dr Christine Hulbe, Profile, <http://www.otago.ac.nz/surveying/staff/otago040901.html> (accessed 28 November 2016).
2. "Science in Progress: Ross Ice Shelf Programme," *Antartica New Zealand*, <http://www.antarcticnz.govt.nz/science/our-science/science-in-progress/> (accessed 28 November 2016).
3. Nola Taylor Redd, "Antarctica: Facts About the Coldest Continent," *LiveScience*, July 18, 2012, <http://www.livescience.com/21677-antarctica-facts.html> (accessed 28 November 2016).