

# The Antarctic Site Inventory



**2009 Annual Report  
from  
Oceanites, Inc.**

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**To all Oceanites supporters and friends —**

There are many successes to report — our first published analyses of changes in the Antarctic Peninsula, an ever-growing reliance by Antarctic Treaty Parties on our data compilations and papers, expanding content on the Oceanites website, and a successful launch of the new, online Oceanites Blog, which tracks news about penguins, Antarctica, and global warming.

And yet, because Oceanites and the Antarctic Site Inventory are almost completely dependent on public support, I also must report our ongoing, slow slog through these very difficult economic times. We're totally grateful, as always, for your support — and overwhelmingly grateful to those of you who were able to assist our work over this last year. Hopefully, brighter days lie ahead and, best we can, I'm intending to maintain forward progress with our science and educational initiatives.

Indeed, we're on the cusp of great work — our database continues to service the entire community of Antarctic interests and, perhaps more critically, we're beginning to produce the groundbreaking, unprecedented analyses that we hope, for the first time, will explain precisely how the warming Antarctic Peninsula climate affects Antarctic penguins and other fauna and flora. Also, via our website and blog site, we're assuredly advancing the cause of "connecting the world" to penguins and global warming science.

Another field season is underway, onboard the Lindblad Expeditions vessel the *National Geographic Explorer*. We're looking forward to more successes — and thrilled you're with us. Keep dreaming penguins!

With all best wishes,

Ron Naveen  
President, Oceanites, Inc.  
November 15, 2009

## Oceanites and the Antarctic Treaty Antarctic Site Inventory Update

At this year's Antarctic Treaty Consultative Meeting in Baltimore, the US submitted two information papers regarding the Antarctic Site Inventory. The first was our annual summary of results; the second was an overview of the monitoring and assessment approaches we're taking, with a particular focus on the statistical analyses being generated by our colleagues from The Fagan Lab at the University of Maryland.

Over 15 seasons from November 1994 through February 2009, the Inventory now has made 951 site visits and collected data at 128 Antarctic Peninsula locations. Last season, we accomplished 155 visits to 56 locations, including 8 sites not previously visited by the Inventory.

al Reports, our goal is to assist Parties in fulfilling their responsibilities under the Antarctic Environmental Protocol.

## Science Update

Spearheaded by Dr. Heather Lynch at The Fagan Lab (University of Maryland), we've begun to submit and publish papers analyzing changes in the Antarctic Peninsula. We have two papers already in print, two that have been accepted and which are awaiting publication, and an additional four papers are in preparation.

We continue to document rapid change in the relative populations of gentoo and Adélie penguins in the western Antarctic Peninsula. Gentoo penguin populations are not only increasing rapidly at sites like Petermann Is-



**POURQUOIS PAS? ANCHORED IN CIRCUMCISION BAY, PETERMANN ISLAND, 1909**

The Inventory remains a key player at the Treaty level, involved in discussions with both the US and UK governments about producing a 3rd edition of the *Oceanites Site Compendium of Antarctic Peninsula Visitor Sites* and, as well, consultations with Treaty Parties on discussions regarding site monitoring and implementation of the Site Guidelines the Parties have adopted.

The baseline data and information collected and analyzed by the Inventory are crucial to assessment and monitoring efforts at Antarctic Peninsula sites, and will enable changes in resident faunal populations and floral communities to be detected. As noted in previous Annu-

land, historically their southern breeding limit, but are expanding their range southward to colonize either unoccupied breeding sites or areas previously occupied only by Adélie penguins. Also, we continue to document all three *pygoscelid* penguins — Adélies, gentoos, and chinstraps — breeding at Port Charcot, Booth Island, the fifth known Antarctic Peninsula site where these species nest contiguously on the Antarctic Peninsula.

Our efforts to explore and census additional penguin breeding sites on the Peninsula have been successful, and have allowed us to increase the spatial extent and resolution of our efforts to monitor population changes.

The “short story” is that the Peninsula is warming faster (or as fast) as any other location on Earth, with a corresponding increase in the range and population of gentoo penguins, and a corresponding decline in Adélie penguin populations in the western Antarctic Peninsula. Continued efforts to document change in the Weddell Sea will provide critical information regarding those populations which, by virtue of their enormous size, are harder to monitor.

Our analyses, hopefully, will be the first-ever explanation of precisely how the warming Peninsula causes these changes — e.g. whether or not the changes we’ve detected are or may be related to food (krill and fish distribution and abundance), disease, oceanography, other changes in the physical environment, or a synergy of these factors.

### **The 2009-10 Field Season**

The Antarctic Site Inventory's 16th field season began in early November 2009 onboard the Lindblad Expeditions vessel *National Geographic Explorer*.

The roster of researchers for the new season includes: Ron Naveen, Rosemary Dagit, Steven Forrest, Iris Saxer, Michael Polito, Melissa Rider, Aileen Miller, Paula Casanovas, Elise Larsen, Elise Zipkin, and Bill Paterson.



### **Oceanites Education**

The Oceanites Website — [www.oceanites.org](http://www.oceanites.org) — has had a successful first year of operation, taking us closer to the goal of an interactive, multilingual website servicing the needs of Antarctic enthusiasts, penguin-lovers, and Antarctic diplomats, scientists, and conservationists.

In addition, we’ve now launched the adjunct Oceanites Blog site — <http://oceanitesfeed.wordpress.com/> — that tracks the latest news regarding penguins, our Antarctic Site Inventory project, and global warming.

### **“Counting Penguins”**

*Counting Penguins*, a half-hour documentary film about Oceanites and the Inventory, produced by the Lindblad Expeditions Video Unit, will debut on the *National Geographic Explorer* during the 2009-10 season, with hopes of bringing the film, ultimately, to a nationwide audience.

Under the direction of Bill Kinzie, the film recounts the work of the Antarctic Site Inventory at Petermann Island from 2003-08, how we tally penguin nest and chick counts, and what the data portend regarding changing

population numbers of Adélie and gentoo penguins. Quite literally, Petermann Island’s penguins are the “canaries in the coalmine” presaging what changes ultimately might happen to those of us living in more temperate parts of the planet.

### **Celebrating Louis Gain, the First Penguin Counter**

In 1909, Jean-Baptiste Charcot and the Second French Antarctic Expedition overwintered at Petermann Island. During that sojourn, Charcot’s lead biologist, Louis Gain — shown below in his cabin on the Expedition’s vessel *Pourquoi Pas?*, accomplished seminal penguin-ringing experiments and penguin censuses that provide us a 100-year perspective of change at this site.

Louis Gain was an inveterate photographer, and Oceanites is coordinating with the Musée National D’Histoire Naturelle in Paris to examine and then, hopefully, exhibit Gain’s glass-plate Antarctic photographic archive. The glass plates are presently being cleaned and digitized.

To celebrate this anniversary, Oceanites is assisting the Louis Gain Exhibition opening this month at the Musée d’art et d’histoire Marcel Dessel in Dreux, at which there is expected to be a panel describing the work of the Antarctic Site Inventory.

In this, the 100th anniversary year of Charcot’s Second French Antarctic Expedition’s overwintering at Petermann Island in 1909, we fondly recollect the creativity and exploits of the Antarctic’s first penguin-counter, Louis Gain.

Little was then known about penguin life histories and population dynamics, but Gain began unlocking these secrets.

Most cleverly, he crafted makeshift rings from colored plastic and in late January 1909, before *Pourquoi Pas?* pushed south to explore the Antarctic Circle and beyond, Gain attached these rings to the legs of many Petermann Island penguins: violet rings on 50 Adélie adults, yellow rings on 75 Adélie young, brown rings on 20 gentoo adults, and pink rings on 20 gentoo young.

When the penguins returned in the austral spring that October and November, none with yellow or pink rings were recorded. Gain deduced that, while adults return to the same breeding location each season, their chicks don’t, at least not immediately. Subsequent studies now confirm that, if penguin chicks survive to breeding age two or more years later, they will, indeed, return to the edges of their natal colony to breed.

In addition, Gain was a keen observer of penguin characteristics and behavior. He noted that the gentoo penguin was “distinguished by the white spot above each eye and by its red beak” and that they are “much quieter,” very “careful of their own appearance and of their rookery,” and that their nests are also “better constructed, most frequently made of stones to which they add some tail feathers.”

He found the Adélie penguins more captivating, the prototypical black-and-white bird-in-a-tuxedo that “watches over everything; it is to him, indeed, that the Antarctic belongs. Curious, unruly, violent, a chatterbox and blusterer, of an extraordinary liveliness.”

The Antarctic Site Inventory project is, for sure, a major exercise in counting penguins — specifically, how many nests there are each season, and how many chicks are produced. The nest counts are a measure of population size, and the number of chicks produced per nest is a measure of breeding productivity. These data are major components of the unique and unprecedented analyses now underway at The Fagan Lab, University of Maryland.

The Inventory project uses occupied nests as the measure of penguin population size, but, in 1909, no standardized data protocol existed. Gain's maximum counts were 1,850 Adélie adults and 112 gentoo adults, which, assuming that two individuals comprise one occupied nest, pegs the 1909 population at an estimated 925 Adélie nests and 56 gentoo nests.

Penguin censusing begins with the most basic of equipment — handheld “tally-whackers” — to total the number of penguin and seabird nests and chicks we encounter. From year-to-year, there's an emphasis on replicating counts accomplished in previous seasons. Then comes the hard part: Trying to make sense of myriad data points and related information.

For years, it was assumed that penguin population changes were driven by the extent of winter sea ice. By this theory, if it's a heavy ice winter, then the ice-edge-hugging Adélie penguins would return in greater numbers than the open-water-loving chinstrap penguins. The correlations held until the mid-1990s, when both species started to show declines, irrespective of the extent of winter sea ice.

Enter new theories, tied to Antarctic Peninsula temperatures that, since 1957, have risen by an average of 5°F (2.8° C) year-round, and by 9°F (5°C) in winter, and tied to seeds sown by Louis Gain a century ago.

Comparing Gain's data to recent data collected by the Antarctic Site Inventory, the Petermann Island penguin populations have totally flipped, Adélie penguin nests dropping from 925 in 1909 to fewer than 400 today, while gentoo nests have increased from 56 to more than 2,200.



Gain's data, therefore, assist the Antarctic Site Inventory's analyses of change over an entire century at a single Antarctic location.

And beyond Petermann Island, looking at the entirety of the warming Antarctic Peninsula, the Inventory's task is to understand more particularly why gentoo penguins are doing well and Adélie penguins are not.

What's happening? Are the penguins' favored prey species changing their distribution pattern? Or have these prey species declined? Is the oceanography surrounding Antarctica changing? Are new disease factors entering the picture?

The ultimate question is whether penguins can adjust to changing circumstances — some species will, others won't, and it's the same concern that arises everywhere and for all creatures, including humans.

The science marches on and the Antarctic Site Inventory is attempting to explain these significant changes and, hopefully, will be able to do so, in large part, with the foundation provided by Louis Gain and his penguin-counting at Petermann Island — one hundred years ago, in 1909.

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The Oceanites Blog — <http://oceanitesfeed.wordpress.com/>

**All photos in this issue were taken by Louis Gain at Petermann Island in 1909, and we extend our thanks and gratitude to Fond Louis Gain, collection MIMDI, for permission to use them.**