

IMAS



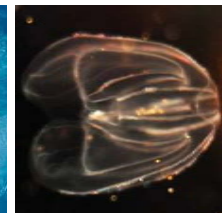
translating **nature** into **knowledge**

INSTITUTE FOR MARINE AND ANTARCTIC STUDIES

Antarctic Tourism

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9 – Antarctic Tourism

There are more tourists visiting the Antarctic than there are scientists. This seminar examines the characteristics of Antarctic tourism, including how it is managed and what the current issues are. It particularly focuses on recent initiatives from the International Maritime Organization which will introduce a ban on the use or carriage of heavier fuel oils south of 60° South (which many Antarctic tourist vessels use) and the establishment of a mandatory Polar Code for Shipping (which will apply equally to the Arctic) in which new polar classes for ships is expected.

Recommended reading

Government of New Zealand (2010) International requirements for ships operating in polar waters. Information Paper 11 to ATCM XXXIV, Punta del Este, 2010.

Jabour, J (in press) Strategic management and regulation of Antarctic tourism, in Tin T, Liggett D, Maher P and Lamers M (eds) The Future of Antarctica: Human impacts, strategic planning and values for conservation. Springer 2012.

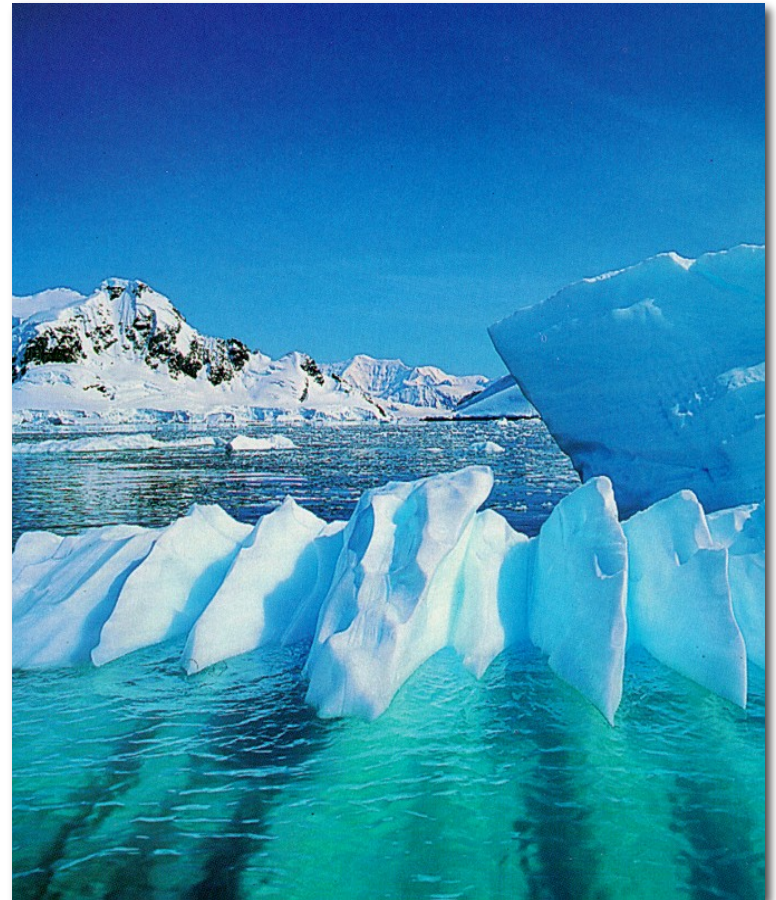
Destination Antarctica

- Key Features of Antarctic Tourism
 - Mainly ship-borne
 - 95%+ operate from South America to Antarctic Peninsula
 - Formerly niche market; now more accessible
 - Layers of regulation but primarily industry-based
 - ~34,000 tourists (not staff & crew) 2010/11, decrease of ~30% in three years



What is the attraction?

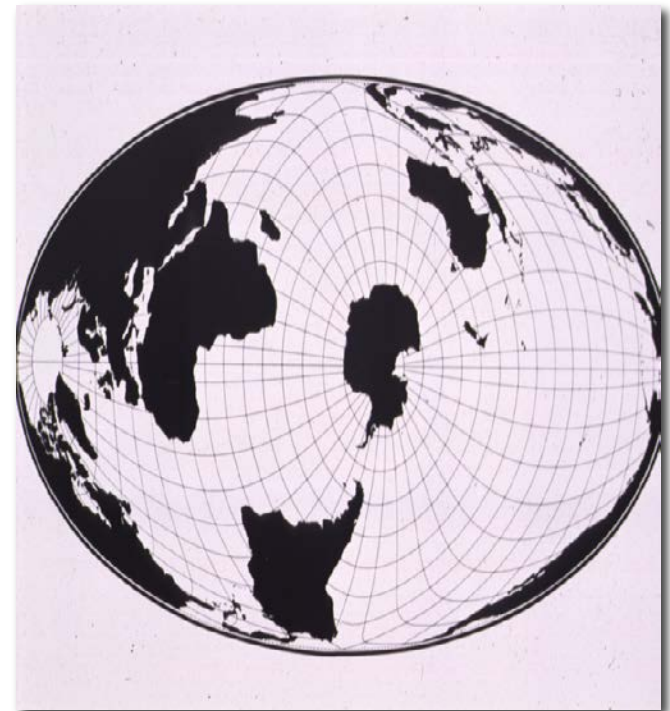
- Iconic status based on
 - Beauty
 - Isolation
 - Wildlife
 - Spiritual qualities
- Inspires artists, writers, poets, painters, adventurers, explorers, scientists, academics, politicians, students like you -- and tourists!



Antarctic Geography

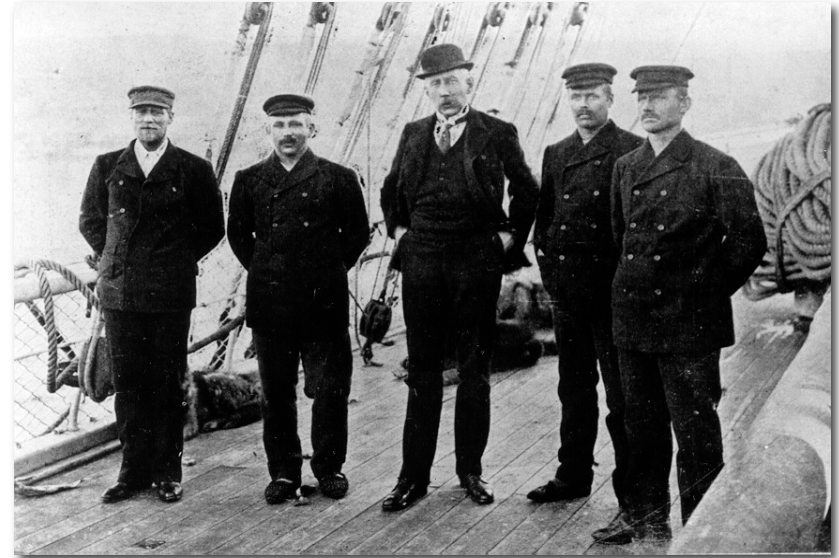
HIGH, DRY, WINDY, COLD

- extreme weather = danger
- Gateway Countries:
 - South America, Australia, New Zealand, South Africa
- Drake Passage v. Southern Ocean
- 2% ice free – coastal focus, thus competition for space at critical breeding times



The first tourists

- 1700s, eg James Cook
- Sealers 1700s–1800s
- Continental explorers 1800s–1900s Apsley Cherry Garrard (author of "The Worst Journey in the World") and Captain Lawrence Oates (*"I am just going outside, I may be some time"*). Both paid Capt Scott £1,000 to go on his *Terra Nova* expedition in 1910



- **Whalers 1800s–1900s**
- **Scientists**
- **Commercial tourists**
- **Adventure tourists**



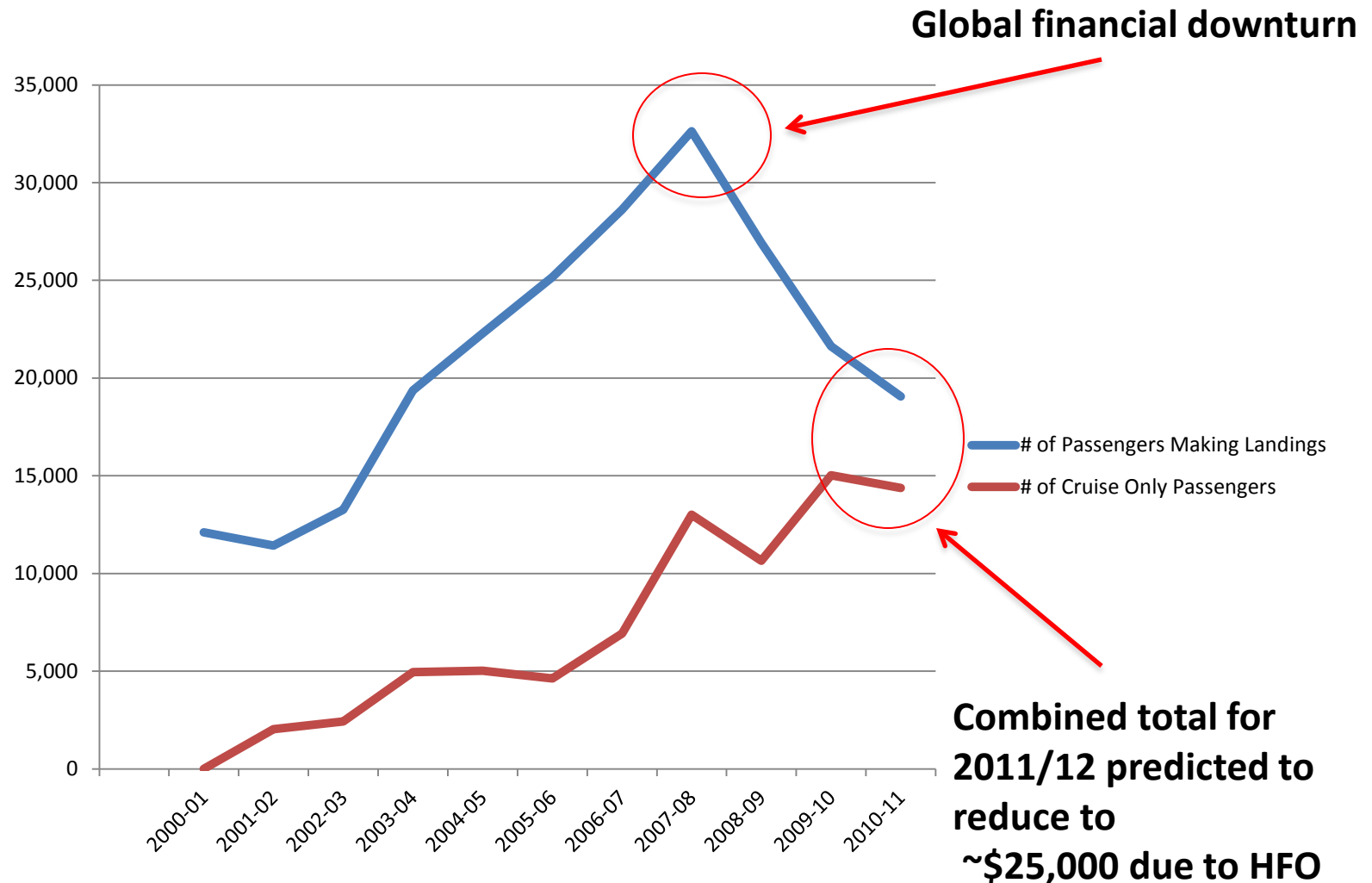
Remnants of whaling vessel and whale bones, Antarctic Peninsula. © J Jabour, 2005

Tourism (Non-Government) Activities

- commercial seaborne tourism
- commercial airborne tourism
- air-supported land-based adventurers
- independent adventurers



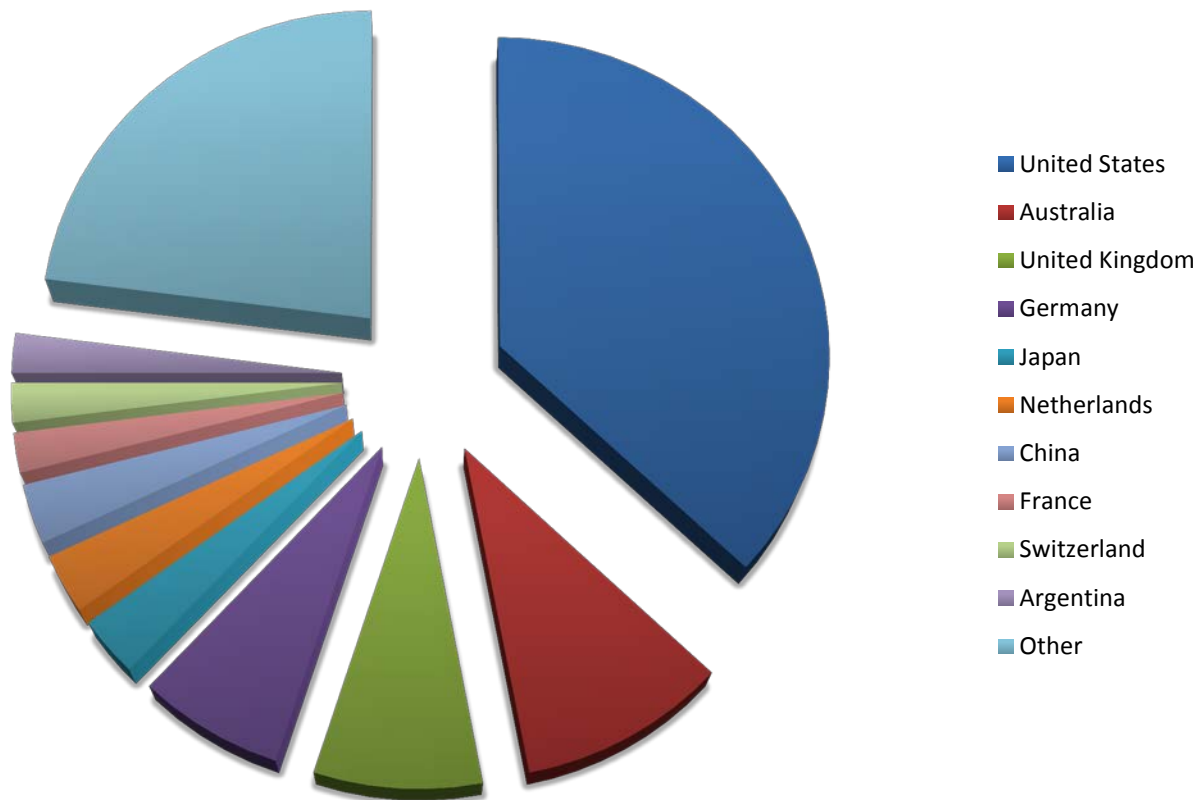
Numbers



Source: www.iaato.org

Passenger Nationalities

% of total



Source: www.iaato.org

Typical Commercial Seaborne Tourism

- 1966 *Lindblad Explorer* (yes, the ship that sank in 2007) began with niche, expensive market
- Now industry caters to range of economic classes
- Increasing numbers of tourists travel by sea each year

Tourists are typically

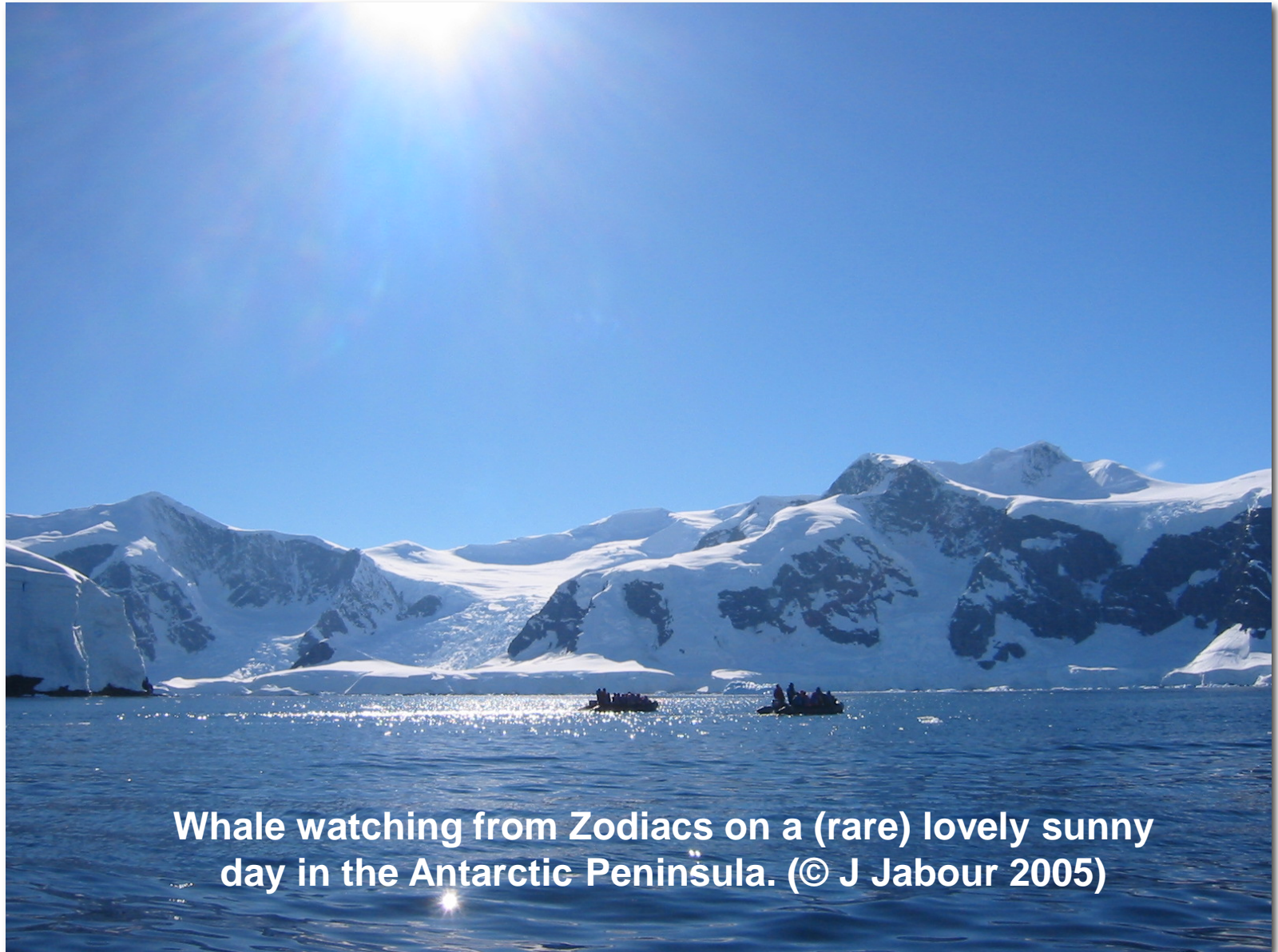
- tertiary educated
- wealthy
- well-traveled



What do they do?

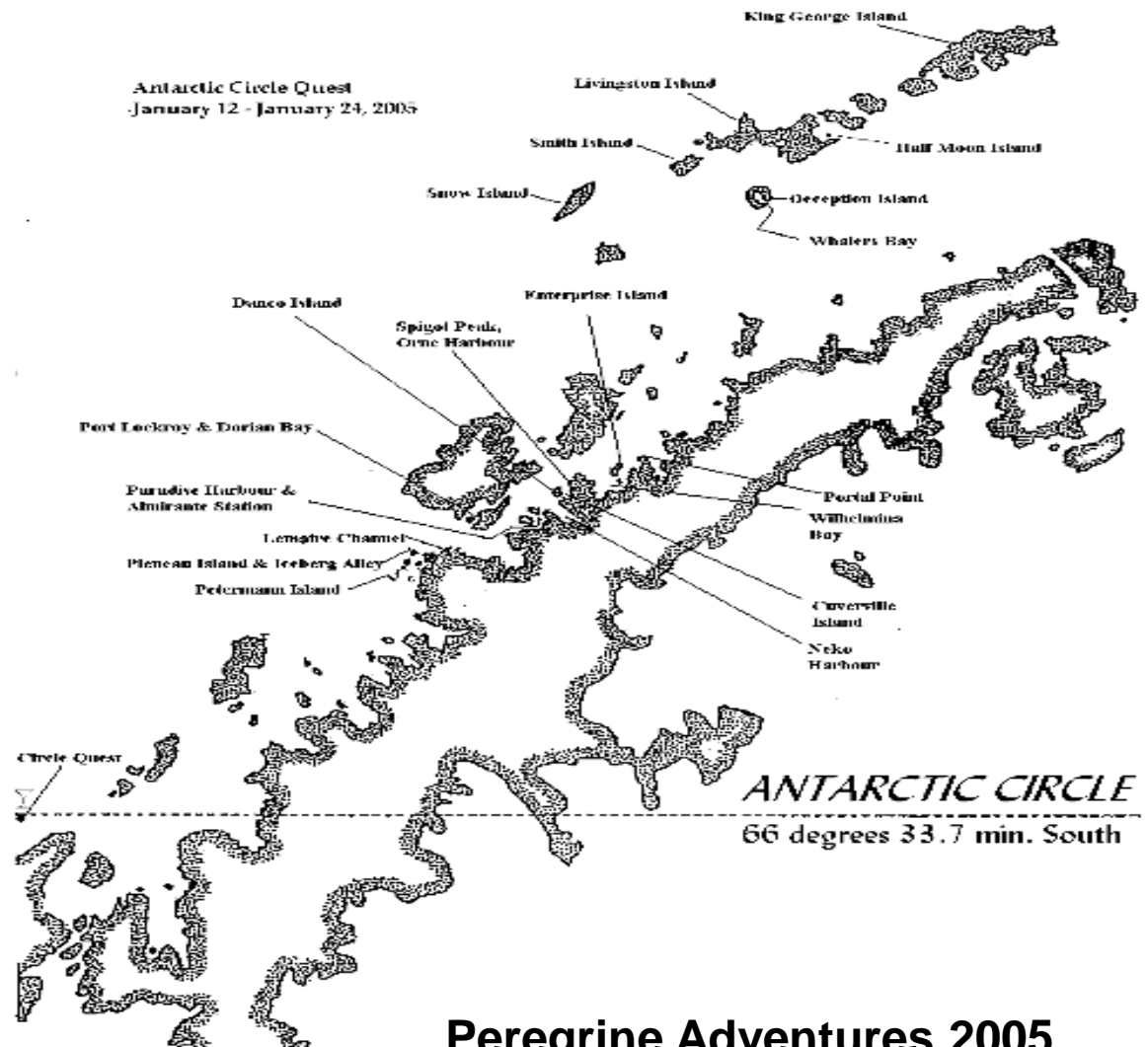
- Cruise 2 days across Drake Passage
 - Lecturers on wildlife biology, photography, politics, history...
- Make Zodiac landings morning, afternoon and sometimes evening
- Visit penguin and seal colonies
- Camp on the ice
- Sea kayak, SCUBA, Underwater Remotely Operated Vehicle (ROV)
- Trek





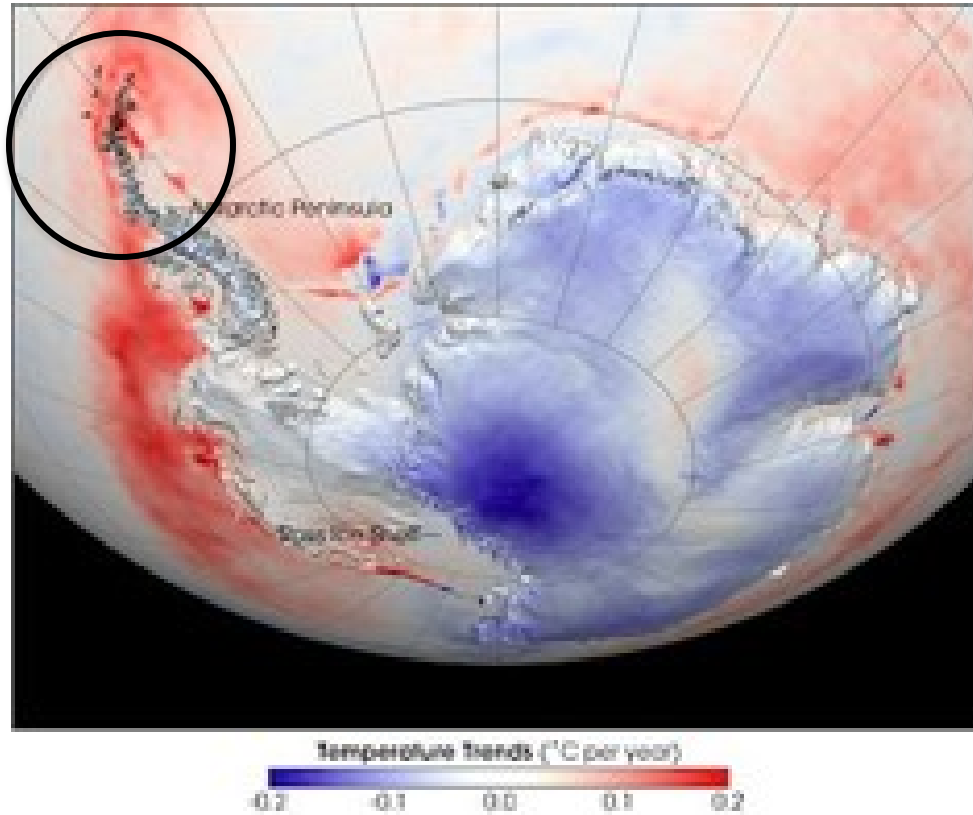
Whale watching from Zodiacs on a (rare) lovely sunny day in the Antarctic Peninsula. (© J Jabour 2005)

Typical Seaborne Tourist Itinerary - Antarctic Peninsula



So what?

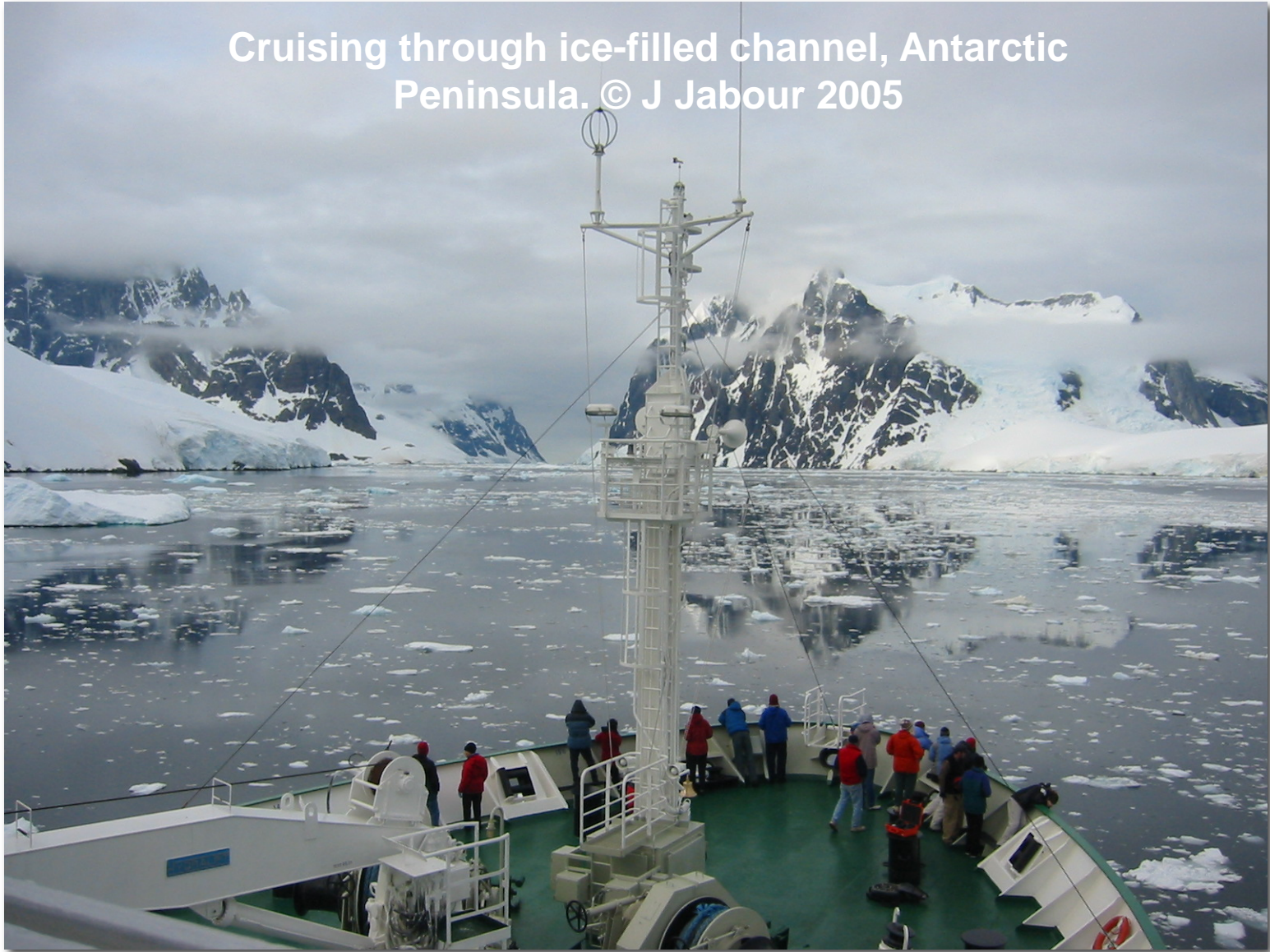
Hot spots of
activity →
coincide



Temperature trends from 1981-2007

(Source: NASA 2008)

Cruising through ice-filled channel, Antarctic Peninsula. © J Jabour 2005





**Kayakers prepare to head out; no experience
necessary... © J Jabour**

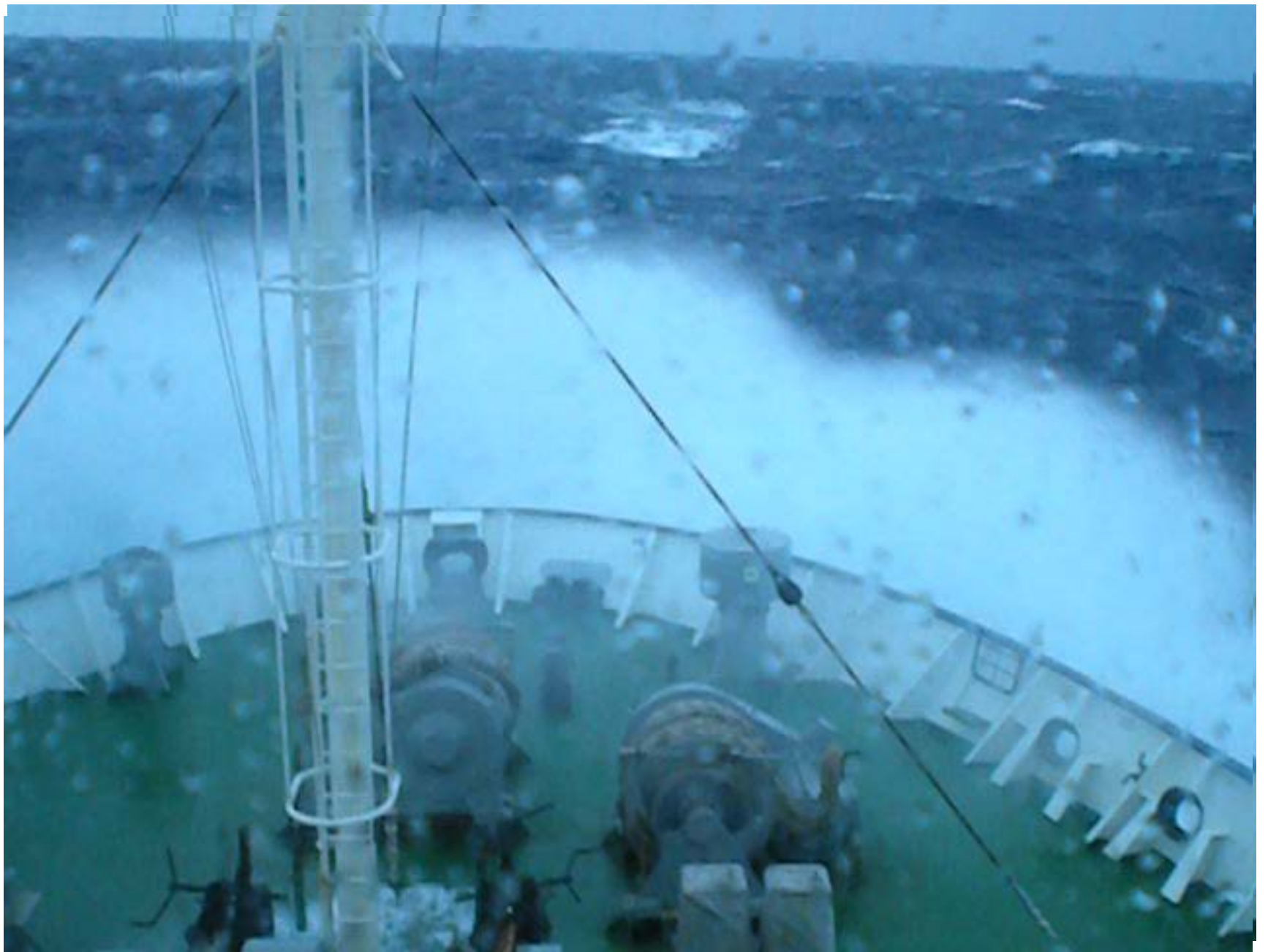
East Antarctica

From Hobart, cruise 3 days to Macquarie Is

– Lectures on wildlife biology, photography, politics, history...

- Make Zodiac landings
- Cruise 3 days to Commonwealth Bay
- Visit penguin and seal colonies and Mawson's Huts
- Cruise 2-3 days to Ross Sea
- Visit huts / islands en route
- Cruise 2-3 days to Auckland/Campbell Island
- Make Zodiac landings







(c) Rob Suisted - www.naturespic.com

**Mawson's Huts,
Commonwealth Bay.**

Typical Airborne Tourism

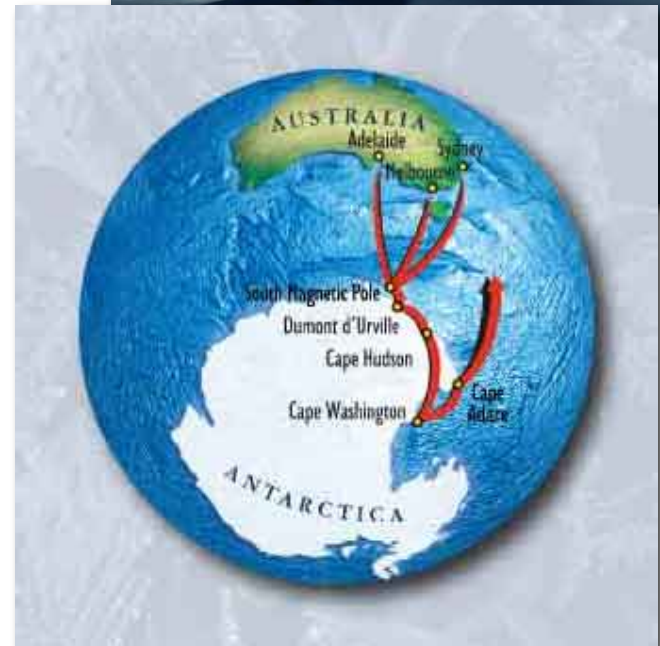
- Began in 1956 ex Chile to Peninsula
- 1957 NZ to McMurdo Sound
- Qantas/Air NZ - 44 flights 1977-79, 11,000 passengers
- Mt Erebus crash 1979
 - 257 people died
 - Over-flights suspended
 - Mt Erebus now historic monument



Mt Erebus Monument

QANTAS Antarctic Over-flights

- 1994 Qantas resumed Boeing 747 over-flights
- 13 hour return trip
- ex Melbourne, Sydney, Adelaide
- \$900 - \$5,000
- 6 – 10 flights each year (none recently)
- Croydon/Qantas no longer IAATO members



Typical Land-Based Adventure Tourism

- Air-supported land-based tourism run by two companies, including the oldest—ALE—which provides:
 - Air support (fly to Patriot Hills)
 - Air drops of supplies
 - Emergency rescue
 - Guides and supervised expeditions
- Activities include
 - mountain climbing and skiing
 - trekking and traversing ice-cap
 - wildlife and scenic photography
 - balloons, aircraft and sky-diving
 - marathons



Spigot Rock, Antarctic Peninsula. © J Jabour 2005

Independent Adventurers

- Often self-funded and self-propelled
 - Own yachts or yacht charter
 - Own aircraft (home-built)
- Often have a mission, such as “breaking a record”
- Cause the ATCPs problems
 - Often don’t have permission to land and have not conducted EIA – Case of “Berserk”
 - Parties don’t know what to do with them
 - Parties don’t like people “just dropping in” to their stations

The Norwegian yacht *Berserk* heavily encrusted with ice before she sank in the Ross Sea in February 2011 with the loss of 3 lives.



Sea Shepherd crew find tattered life raft from *Berserk* . NZ Rescue called off the search for survivors in Mar 2011.



Berserk skipper, Jarle Andhøy, and another adventurer were on their way to the South Pole when the yacht was lost. Norwegian authorities will charge him with negligence (not for the first time).



DVD: Antarctic Circle Quest

Tourism Trends

- Seaborne tourists to Peninsula doubled but now may be dramatically reduced
 - global financial crisis
 - *Explorer* sinking
 - increasing costs of compliance
- Diversification of activities, incl cruise only
- Increasing number of sites visited
- Increasing joint ventures between operators and national Antarctic programs
- Larger tourist vessels with >1,000 pax
- Reintroduction of overflights
- Independent adventurers

Regulation/Management

- Three layers of regulation:
 - HARD
 - Antarctic Treaty Consultative Parties through State Governments/Flag States
 - SOFT
 - Industry by-laws, management guidelines, site specific guidelines
- Key players work together through ATCM to regulate and manage tourism

1: Antarctic Treaty Consultative Parties (ATCPs)

- 1966
 - tourism activities may "prejudice the conduct of scientific research, conservation of fauna and flora and the operation of Antarctic stations"
- 1975 tourism acknowledged as "a natural development" which required regulation
- Decade mid 1980s to mid 1990s, tourism numbers increased by 800% !
- Some Parties wanted an annex to the Madrid Protocol specifically dealing with tourism, but it did not succeed

Rising costs of compliance

Instead, using International Maritime Organisation as platform for increasing rules:

- Convention on Ballast Water Management
- Annex to MARPOL (marine pollution convention) on controlling emissions from ships
- Change to MAPROL annex so no heavy or intermediate fuel carried into or used south of 60° South
- Guidelines for ships operating in polar waters soon to become mandatory (ie. law)
 - New ice classifications for ships, determines which ships, when they can travel, and where

Important ATCM Interest

- Cape Town 2004 – 1st ever tourism Measure
 - Measure 4: Insurance and Contingency Planning
 - Means all tourist operators need insurance for emergency search and rescue and medical evacuation
- Stockholm 2005
 - Resolution 5: Site specific Guidelines
 - 4 key tourist sites (Penguin Is, Aitcho Islands, Cuverville Is, Jougla Point); now 27
 - Guidelines do NOT apply to scientists

Baltimore 2009

- Measure 15 (legally binding)
 - To refrain from making landings from ships with >500 passengers
 - 1 ship at a time; 100 people max. ashore at once; guide: pax ratio of 1:20 (All in IAATO By-Laws)

2: State Governments

- ATS requires and respects “flag state jurisdiction” and “national jurisdiction”
 - ie. State governments have jurisdiction over their nationals and organisations
 - eg. Australia has laws which apply to Australians ANYWHERE in Antarctica
- Can require operators of ships/companies registered in their country to complete and submit EIA, grant permits, put conditions on visitation, etc
- Can insist on on-board observers

2: State Governments

- But inconsistencies in application of Madrid Protocol obligations already evident
- Enforcement is a 'voluntary' State responsibility (ie. mandatory but States are ultimately accountable only to themselves)
 - need political will to create and enforce legally binding obligations on all citizens/organisations, thus divergence of interpretation and standards
- No time-frame established for Protocol obligations to become national law, so some states lag behind

2: State Governments

eg. Australia requires registered Aus operators to submit a PA under *Antarctic Treaty (Environment Protection) Act*

- The PA is assessed 'in-house' by Assessing Officer; no public consultation
 - If no more than a minor or transitory impact, activity approved
- Otherwise IEE or CEE to be prepared; both require public consultation and higher level of authority

3: Industry

- International Association of Antarctica Tour Operators (IAATO) voluntary membership, therefore not ALL Antarctic tour operators are members
- Voluntary compliance with By-Laws
 - One sanction is to be downgraded in membership status; also possibly expelled but never used
- Members pay a fee
- Members meet annually to plan next season
- Report annually to ATCM (expert observer status at meetings)
- IAATO collects important data, publicly available on their website: www.iaato.org



INTERNATIONAL ASSOCIATION OF ANTARCTICA TOUR OPERATORS <http://www.iaato.org>

- To advocate, promote and practice safe and environmentally responsible travel to the Antarctic.
- To operate within the parameters of the Antarctic Treaty System...
- To foster continued cooperation among its members...
- To enhance public awareness and concern...
- To create a corps of ambassadors for the continued protection of Antarctica.
- To support science in Antarctica



*Nordnorge rescuing passengers from Nordkapp
(ship twinning system)*

Titanic II – the *Explorer* sinking

Case study of the sinking of the MV *Explorer* in 2007 for two reasons:

- everything that could go wrong, did go wrong, but no lives were lost and no major environmental catastrophe occurred
- it accelerated the development of the Polar Shipping Code

Analogy is the sinking of the *Titanic* giving rise to SOLAS.

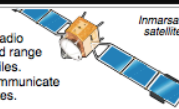
Surviving disaster – The Titanic and SOLAS

In 1914, two years after the Titanic disaster of 1912, in which 1,503 people lost their lives, maritime nations gathered in London adopted the International Convention for the Safety of Life at Sea (SOLAS Convention), taking into account lessons learned from the Titanic. The 1914 version was superseded by SOLAS 1929, SOLAS 1948, SOLAS 1960 (the first adopted under the auspices of the International Maritime Organization) and SOLAS 1974. SOLAS 1974 is still in force today, but it has been amended and updated many times. The regulations relating to life saving appliances and arrangements, contained in chapter III of SOLAS, a new version of which entered into force on 1 July 1998, are intended to ensure that in the event of a catastrophe at sea, passengers and crew have the greatest chances of survival. Improved design and equipment, better fire protection, satellite communications, rescue planes and helicopters and trained personnel also contribute to improved safety at sea.



Distress alert

The Titanic used radio which had a limited range of 200 nautical miles. Ships can now communicate globally via satellites.



Helicopters and rescue planes

Unavailable in 1912, helicopters and rescue planes are now used to locate, search for and rescue survivors.



Speed of navigation around ice

The Commission into the Titanic ruled the loss was due to collision with an iceberg brought about by excessive speed at which she was being navigated. Under SOLAS, when ice is reported on or near his course the master of every ship at night is bound to proceed at a moderate speed or alter course.

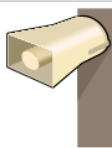
Ice patrol

In the first SOLAS 1914, after the Titanic disaster, ice patrols in the north Atlantic were set up and continue to be a SOLAS requirement.



Public address system

There was no public address system on the Titanic and news filtered to the passengers slowly, adding to the disorder and confusion. Under SOLAS, all passenger ships must be fitted with a public address system.



Lifeboat design

Some people died from hypothermia in the Titanic lifeboats because they were open and gave no protection against the cold. Under SOLAS, lifeboats must be fully or partially enclosed. On passenger ships, partially enclosed lifeboats can be used as they are easier to get into, but they must have a collapsible roof to fold across.



Training of crew in lifeboat drill

The crew of the Titanic lacked training in loading and lowering the lifeboats and few knew which boat they were assigned to. Lifeboats were not filled to capacity because senior officers did not know the boats had been tested and were strong enough. Under SOLAS, every crew member must participate in regular practice drills and have easy access to training manuals.



Number of lifeboats

The Titanic did not have enough lifeboats for all passengers. Under SOLAS, passenger ships must carry enough lifeboats (some of which can be substituted by liferafts) for all passengers, plus liferafts for 25%.



Immersion suits

The sea temperature when the Titanic sank was below freezing point and many people died in the water from hypothermia. Under SOLAS, a specific number of immersion suits must be carried on both passenger and cargo ships, mainly for the crews of rescue boats.

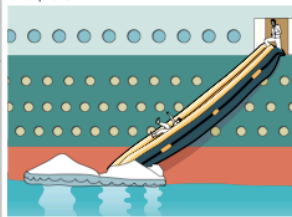


Lifeboat drill

No lifeboat drill was held on the Titanic. Under SOLAS chapter III an 'abandon ship' and fire drill must take place weekly on all passenger ships.

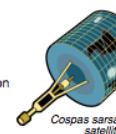
Evacuation chutes

Passengers on the Titanic jumped from windows and doorways into the lifeboats as they were lowered, often injuring themselves or other passengers. New emergency evacuation chutes are both safer and quicker.



Location

The land station at Cape Race, Newfoundland and ships other than the Carpathia and the Californian heard the Titanic distress call but the airwaves were crackling and the Titanic's position was misinterpreted. With EPIRBs and global positioning systems, the position of a ship in distress can be automatically sent.



The Carpathia
Received distress call at 12.25am. Travelled 58 miles and picked up first lifeboat at 4.10am.

The Californian
Stopped because of the ice less than 20 miles from the Titanic. Did not approach until after 6.00am when the Carpathia was spotted. Arrived at 7.30am - too late to rescue any survivors.

The Titanic
Hit iceberg at 11.40pm and sank at 2.20am.

Distress watch

The Californian was less than 20 miles away but the radio officer had gone off duty when the distress messages were sent. Under SOLAS, every ship while at sea must maintain a continuous watch on the distress and safety frequencies.

MV Explorer, 1969–2007

Built Finland for polar explorer Lars-Eric Lindblad
First dedicated Antarctic cruise ship, over 250
voyages

Last owned/operated by Canadian GAP Shipping
Registered in Liberia

GAP Adventures was a member of the
International Association of Antarctica Tour
Operators (IAATO)

Technical details

76m long, 2398 GT

13 knots cruising speed, controllable pitch prop

4 open lifeboats stowed at Bridge deck level

2 @ 39 persons, 2 @ 59 persons

air-cooled engines

Scupper valves drain from 300 level into engine room
and liquid expelled through bilges, to keep vessel
stable

10 RIBs (“Zodiacs”) launched by electro-hydraulic
boom cranes from Bridge deck level

Kelvin-Hughes Voice Data Recorder (white box)

...cont

Classed by DNV in 1969 as 1A1 Ice-A: ice-strengthened single-hulled, double-bottomed

rules have since been strengthened but EXPLORER not required to comply

“The [1969] class notation Ice-A implies a certain strengthening of hull structure and machinery but shall not be assumed to guarantee capability to transit any ice condition.” (DNV)

DNV classification required Special Survey every 5 yrs (last carried out in 2005) to renew Class

...cont

Latest annual survey Oct 2007 found corrosion of some port side shell plates and they were cropped and renewed

Original shell plate thickness = 13.0 mm (min. 10.5 mm) but not measured this survey

Deck plate thickness originally 6.5 mm (min. 5.3 mm)

2007 Survey measured 5.5 mm at the 300 level; agreement to have the area addressed in one year's time

Fuel was Marine Gas Oil

recommended; note than IMO banned heavier fuel oils carriage/use in the Antarctic in August 2011

the “TITANIC II”...

“On evening of 22 Nov [2007] the vessel entered an ice field described by the Master as “first year ice”. The vessel navigated through the ice until about midnight when it hit...a “wall of ice”. The vessel sustained damage to a section of the hull of about 3.1 m which led to rapid flooding...The flooding could not be contained in the one compartment that sustained the initial damage and the flooding spread to other compartments until the EXPLORER sank.”

The rescue...

Chilean MRCC took command but overlapping claims to Antarctic territory (and thus marine areas) made this problematic

91 passengers, 9 expedition staff and 54 crew were rescued

Vessels *NORDNORGE* and *NATIONAL GEOGRAPHIC ENDEAVOUR* assisted

After securing all persons, flag state Liberia investigated; reported to ATCM in 2009 and findings included –



Zodiacs used to tow life boats when motors failed to start



**Criticism of open life boats, not tied together
and no immersion suits, even for crew**



Explorer listing in clear water



the ship's last few hours...





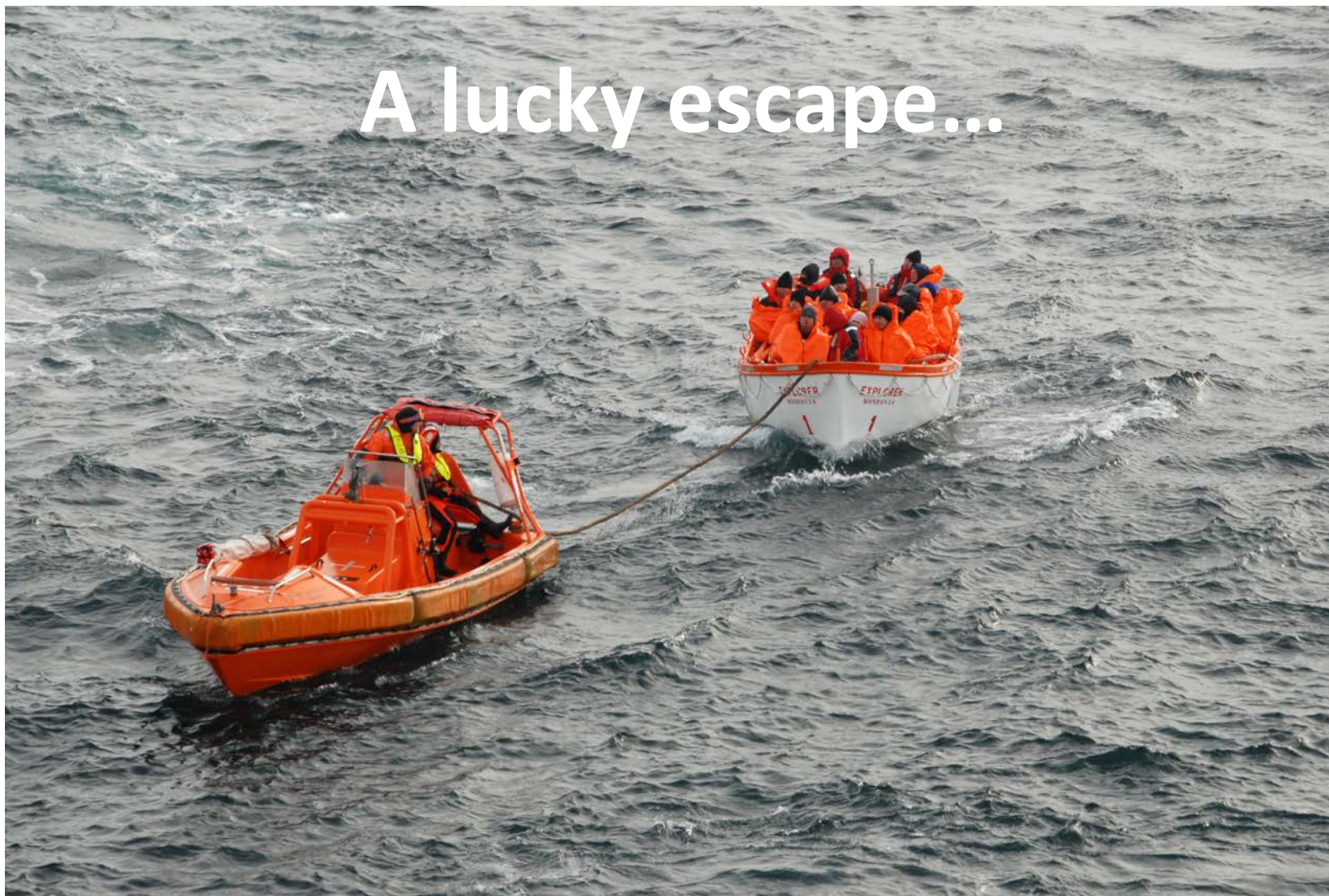
the ice has closed in...

MV *Explorer*, 1969–2007





A lucky escape...



The Master...

Failed to diagnose the composition of ice within the ice field (ie. land and 1st year)

Failed to transit at a safe speed

Failed to diagnose the true extent of the damage

Failed to recover the VDR, despite being reminded to do so (though he did recover the Bridge log and chart in use)

But saved the lives of all onboard by taking appropriate emergency action and abandoning ship before it lost power

Abandon ship!

life boats were not covered

life boats were overloaded

3 out of 4 life boat engines didn't start

light winds allowed the Zodiacs to tow the disabled life boats away from the EXPLORER

some immersion suits available but key personnel did not wear them

emergency supplies in life boats not distributed by crew but found accidentally by passengers

Some recommendations

Liberia should encourage IMO to –

- provide ice pilot competency training under STCW78
- recommend VDR capsules be secured with hydrostatic releases

All Liberian vessels in Polar waters should –

- be fully equipped with immersion suits for all
- have at least partially enclosed life boats
- train Expedition Staff and sign them on as crew
- be members of IAATO

Liberia should encourage DNV to –

- review minimum requirements for plating thickness and update current ice class standards
- review survey procedures to determine if vessel sewerage and down flooding ducts (eg) can compromise watertight boundary in the event of damage

Antarctic regulation

“Measures” from Antarctic Treaty meetings become legally binding once they are transformed from international obligation into domestic law

Annex IV to Protocol on Environmental Protection to the Antarctic Treaty deals with prevention of marine pollution, tied to MARPOL 73/78

Art 10: In the design, construction, manning and equipment of ships engaged in or supporting Antarctic operations, each Party shall take into account the objectives of this Annex.

IMO guidelines

Arctic recommendatory guidelines adopted 2002
(2004 Antarctic Treaty Parties asked IMO to include Antarctica)

2007 IMO began work on POLAR code, although polar ice regimes are different:

Antarctic sea ice is more extensive, faster moving, thinner, has more 1st year and less multi year ice, includes glacier ice

IMO Assembly 26/Res.1024, 2 Dec 09, adopted Guidelines for Ships Operating in Polar Waters, for ships constructed on or after 1 Jan 2011

NOT mandatory but still working on that aspect

A 26/Res.1024

New Polar Classes for ships

All ships should –

- carry at least one Ice Navigator qualified in an approved training program to be developed by IMO
- continuously monitor ice conditions (ACE CRC/AAD project to develop 1–5-day sea ice forecast)
- have structural arrangements adequate to resist global/local ice loads, using suitable materials and vessels tested for ‘sufficient positive stability’ under icing

New Polar Class ships

IACS Polar Ship Rules (2008) designate 7 polar classifications, based on “glancing collision with an ice floe”

| Polar Class | General Description |
|-------------|---|
| PC1 | Year-round operation in all ice-covered waters |
| PC2 | Year-round operation in moderate multi-year ice |
| PC3 | Year-round operation in second-year ice which may include multi-year inclusions |
| PC4 | Year-round operation in thick first-year ice which may include old inclusions |
| PC5 | Year-round operation in medium first-year ice which may include old inclusions |
| PC6 | Summer/autumn operation in medium first-year ice which may include old ice inclusions |
| PC7 | Summer/autumn operation in thin first-year ice which may include old ice inclusions |

All PC ships should–

be able to withstand flooding resulting from hull penetration due to ice impact

have double bottoms over the breadth and length between forepeak and afterpeak bulkheads

Pollutants shall not be carried directly against the outer shell

be provided with directional control systems of adequate strength and suitable design to enable efficient operation in polar ice-covered waters

All PC ships should–

have main propulsion/auxiliary machinery located to provide protection from freezing spray and be designed to operate when ship is inclined at any combined angle of heel/trim expected during ice ops.

carry one personal survival kit / person + group survival kits when daily temps drop below 0°C and ice will be encountered

have fully or partially enclosed life boats with engines equipped with a means to ensure they will start readily at the min. operating temp.

Ocean Nova



Nordkapp



Explorer



Tutorial topic

The International Association of Antarctica Tour Operators manages Antarctic tourism on a day-to-day basis. There are no specific regulations in force to regulate shipping in the Antarctic, other than those that apply generally in international law. Describe, in 200 words, what you think the consequences might be of the combination of the HFO ban and the Polar Code on Antarctic tourism.