Oceanic seamounts: a new humpback whale habitat discovered using satellite tagging

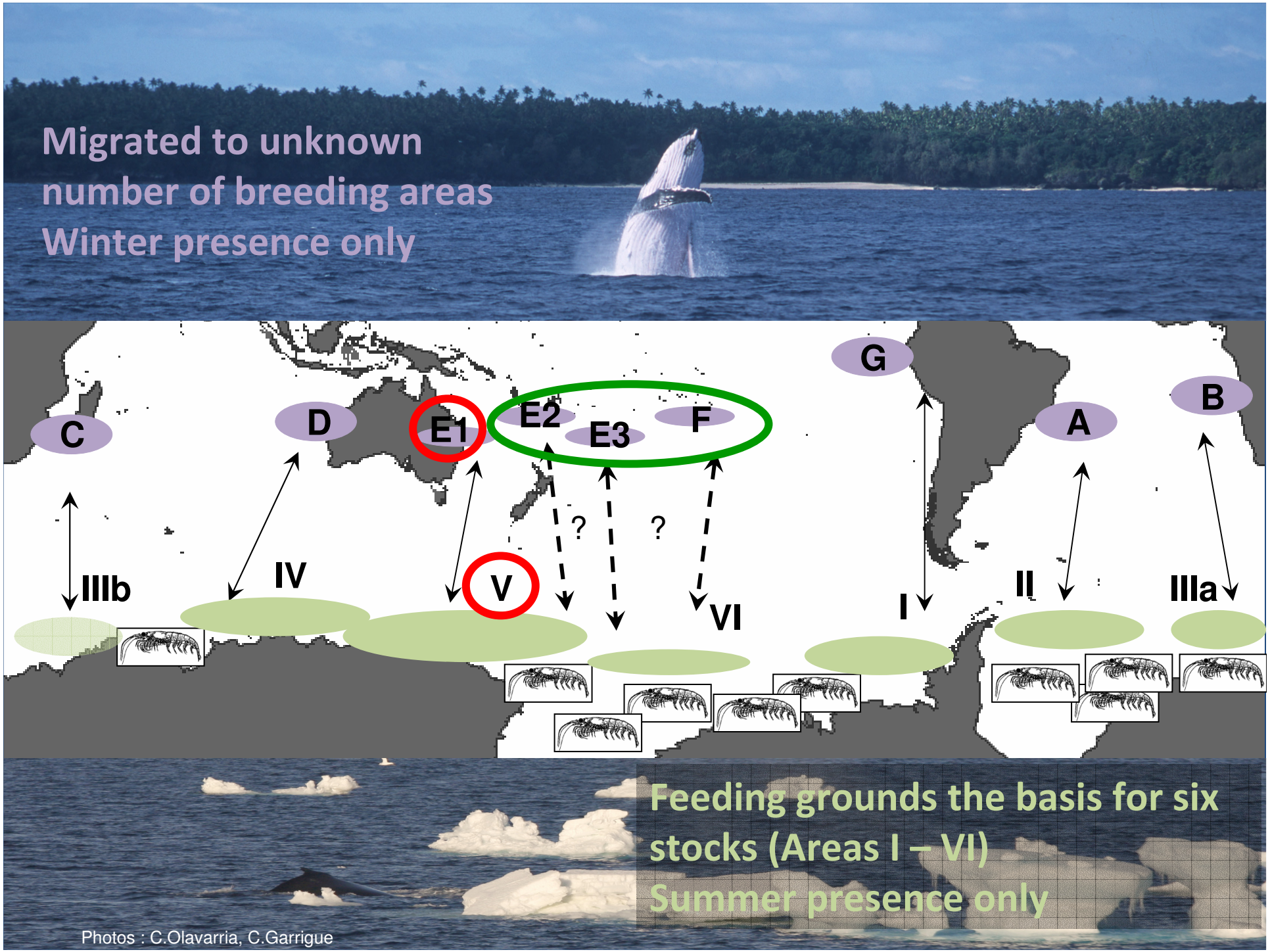
C. GARRIGUE[1], P. CLAPHAM[2], N. GALES[3], Y. GEYER[4], M. OREMUS[1], A. ZERBINI[2,4]

[1] Opération Cétacés, BP 12827, Nouméa, 98802, New Caledonia

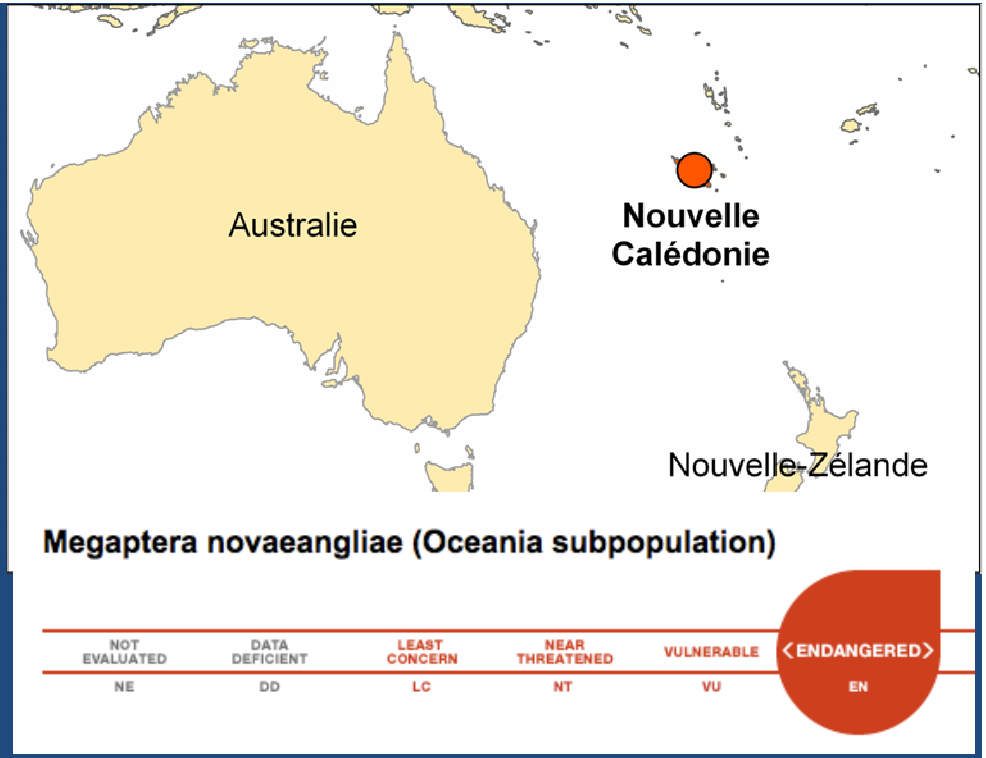
[2] National Marine Mammal Lab, Alaska Fisheries Science Center, Seattle, WA, USA

[3] Australian Antarctic Division, Kingston, Tasmania, Australia

[4] Instituto Aqualie, Projeto Monitoramento de Baleias por Satélite, Rio de Janeiro, Brazil


Migrated to unknown
number of breeding areas
Winter presence only
C
D
E1
E2
E3
F
G
A
B
IIIb
IV
V
VI
I
II
IIIa
?
?
Feeding grounds the basis for six
stocks (Areas I – VI)
Summer presence only
Photos : C.Olavarria, C.Garrigue

New Caledonian humpback whales population



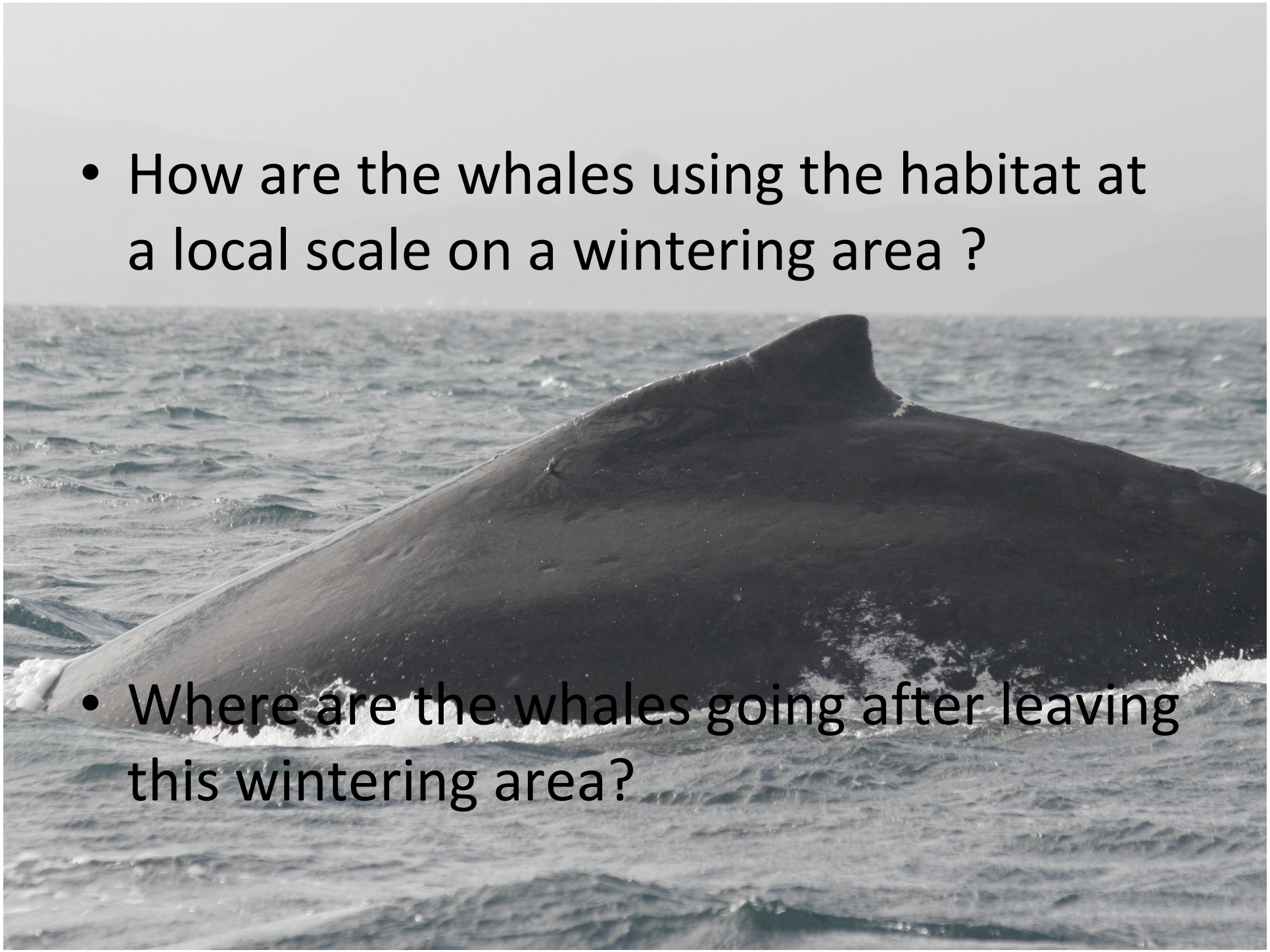
- Isolated *
- N = 415 (e.s. = 103)***
- High site fidelity**
- Status « endangered »
- Feeding ground unknown****

*Garrigue C. et al.. First assessment of interchange of humpback whales between Oceania and the east coast of Australia. Journal of Cetacean Research and Management, Special Isuue 3 (in press).

**Garrigue C. et al. Movement of individuals humpback whales between the breeding grounds of Oceania, South Pacific 1999-2004. Journal of Cetacean Research and Management. Special Issue 3 (in press)

***Madon B. 2010. An extension of the Jolly-Seber model combining two sources of capture-recapture data. PhD Thesis, The University of Auckland.

****Steel et al. 2008. Migratory connections between humpback whales from South Pacific breeding grounds and Antarctic feeding areas demonstrated by genotype matching. Report to the IWC Scientific Committee SC/60/SH13

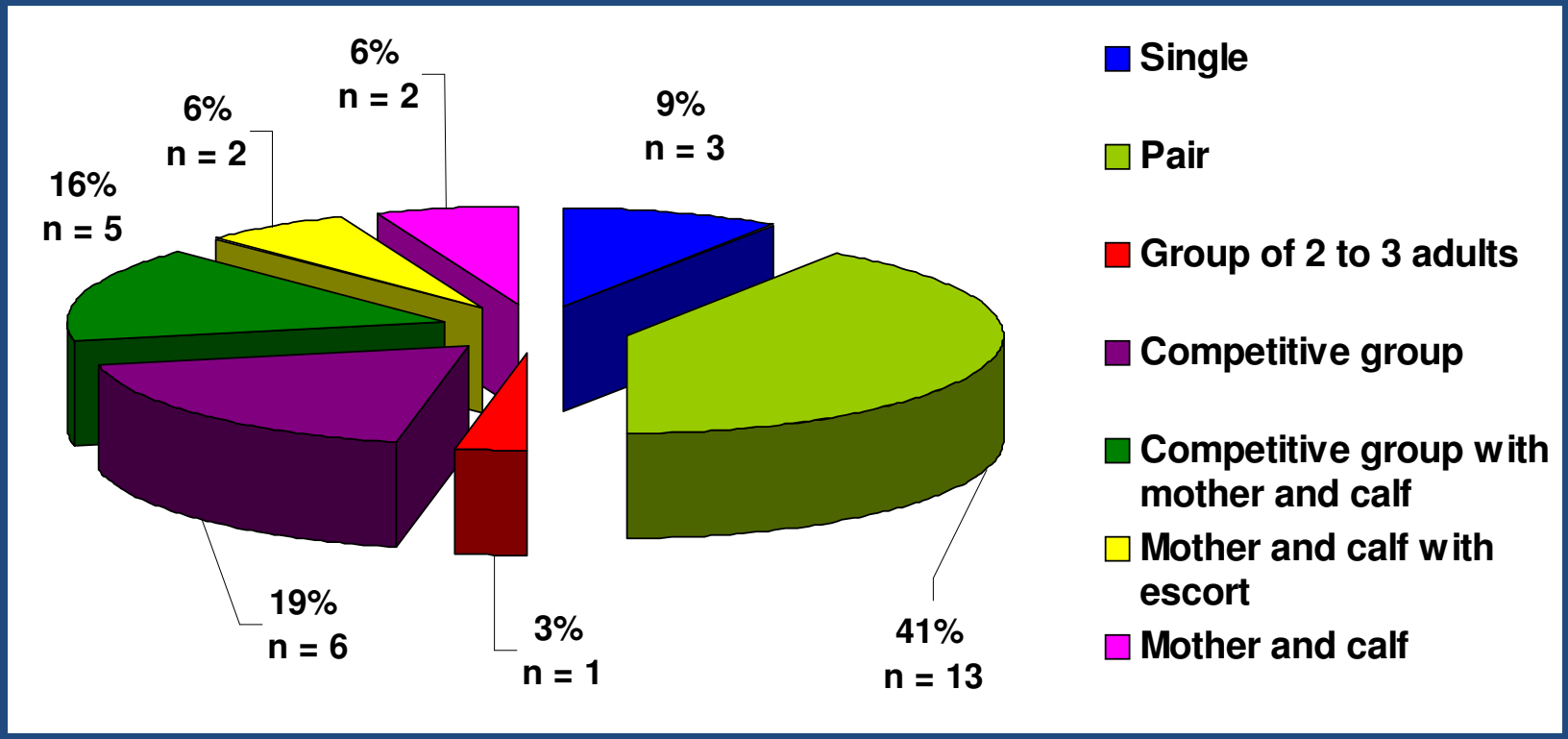


- How are the whales using the habitat at a local scale on a wintering area ?
- Where are the whales going after leaving this wintering area?

Satellite tagging

		#tags
Year	2007	12
	2010	20
Method of deployment	Pole	19
	Arts	13

Information on individual whales tagged

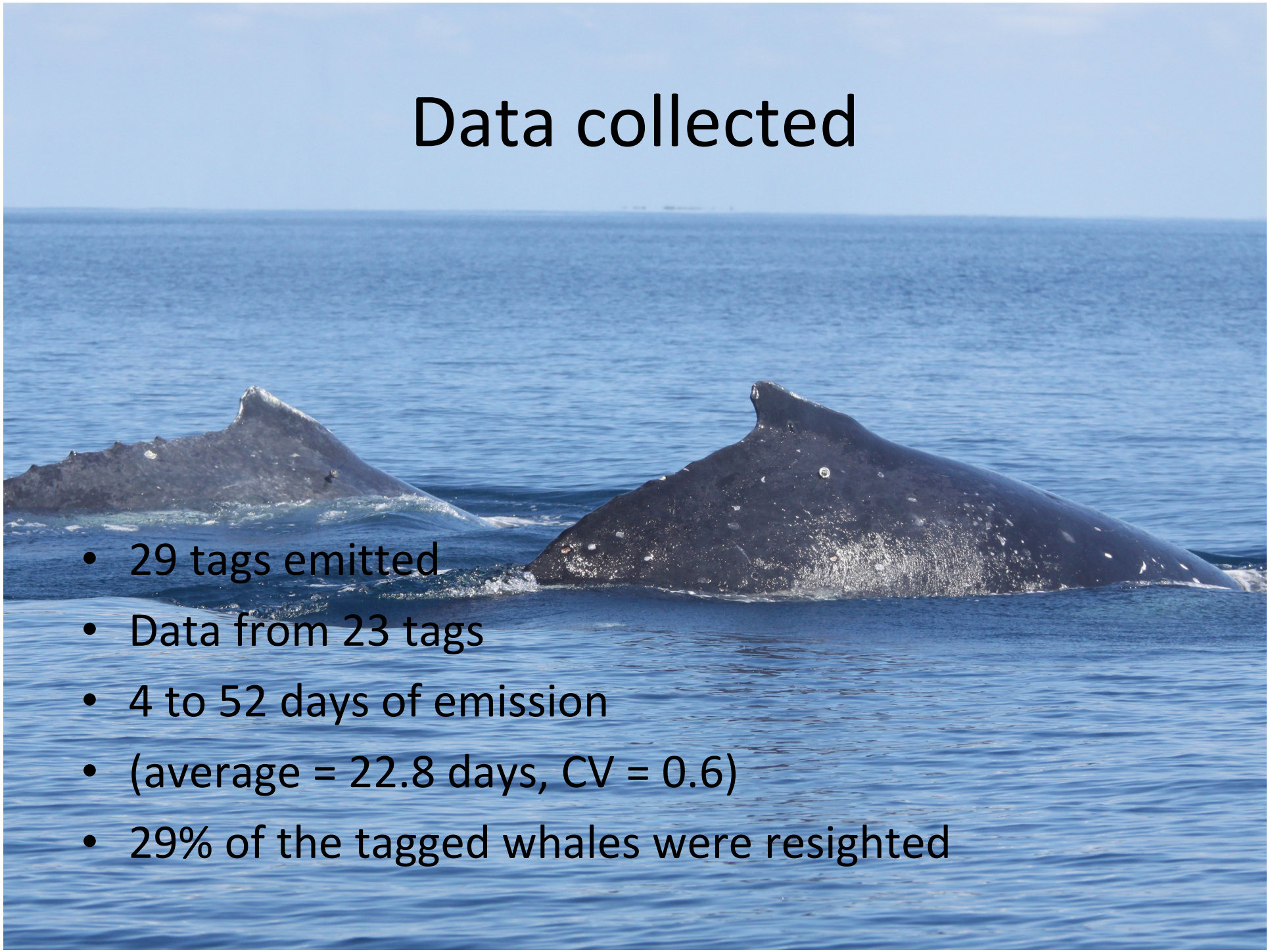


21 males,11 females 5 of which with calf

25% of the individuals observed before tagging
22% in previous year

Reaction	%
No	36
Weak	21
Medium	15
Strong	18

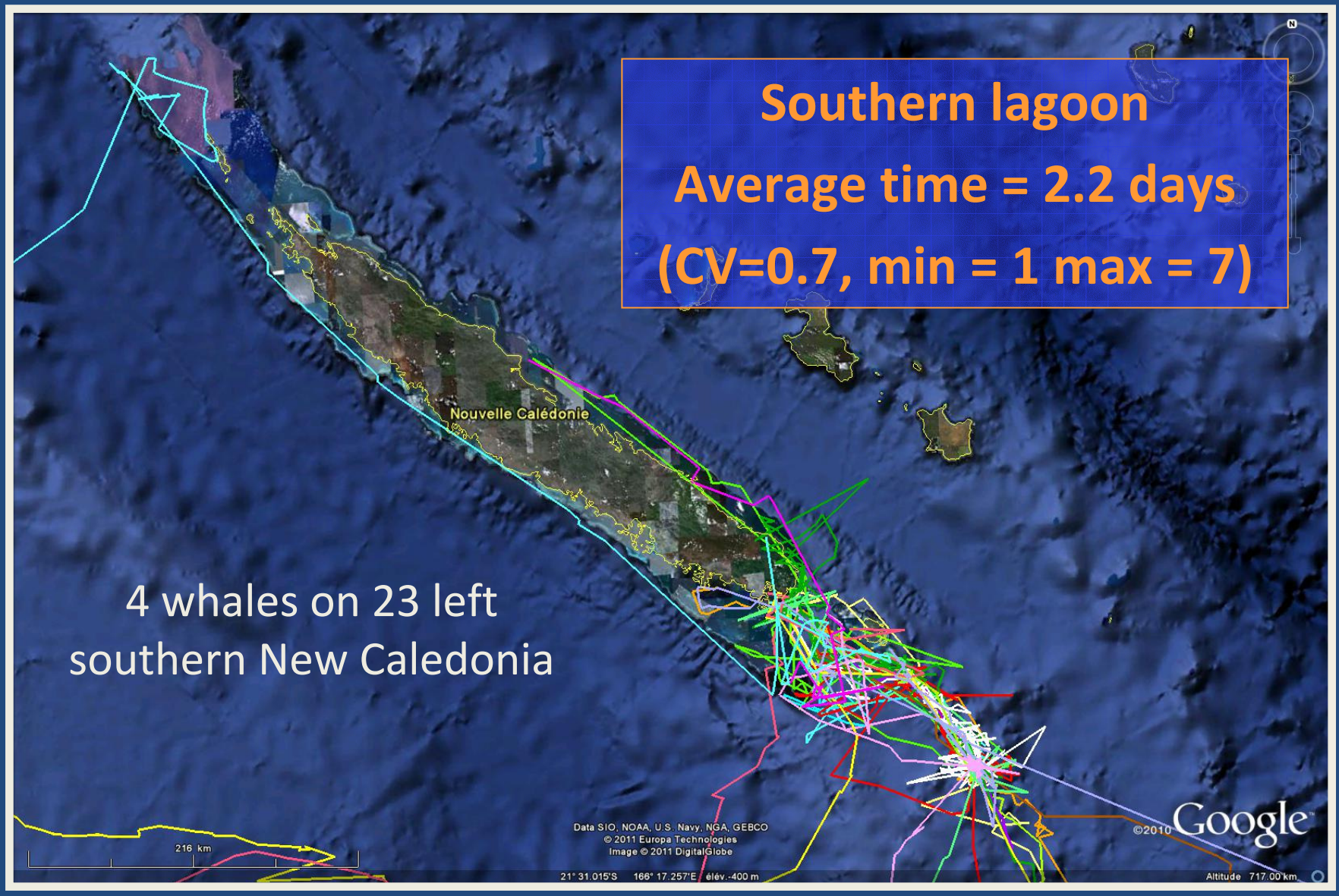
Data collected



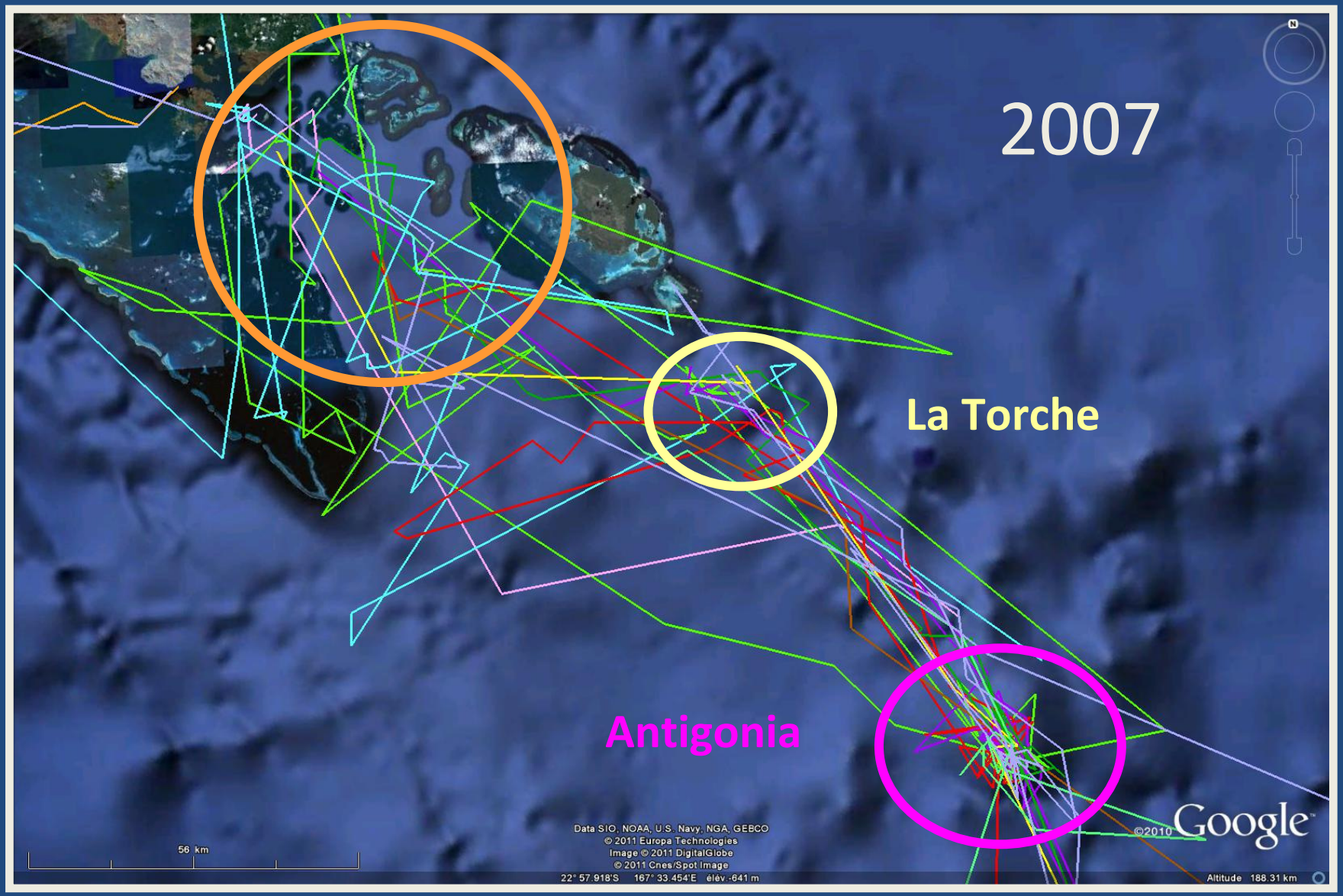
- 29 tags emitted
- Data from 23 tags
- 4 to 52 days of emission
- (average = 22.8 days, CV = 0.6)
- 29% of the tagged whales were resighted

Local scale mouvement :

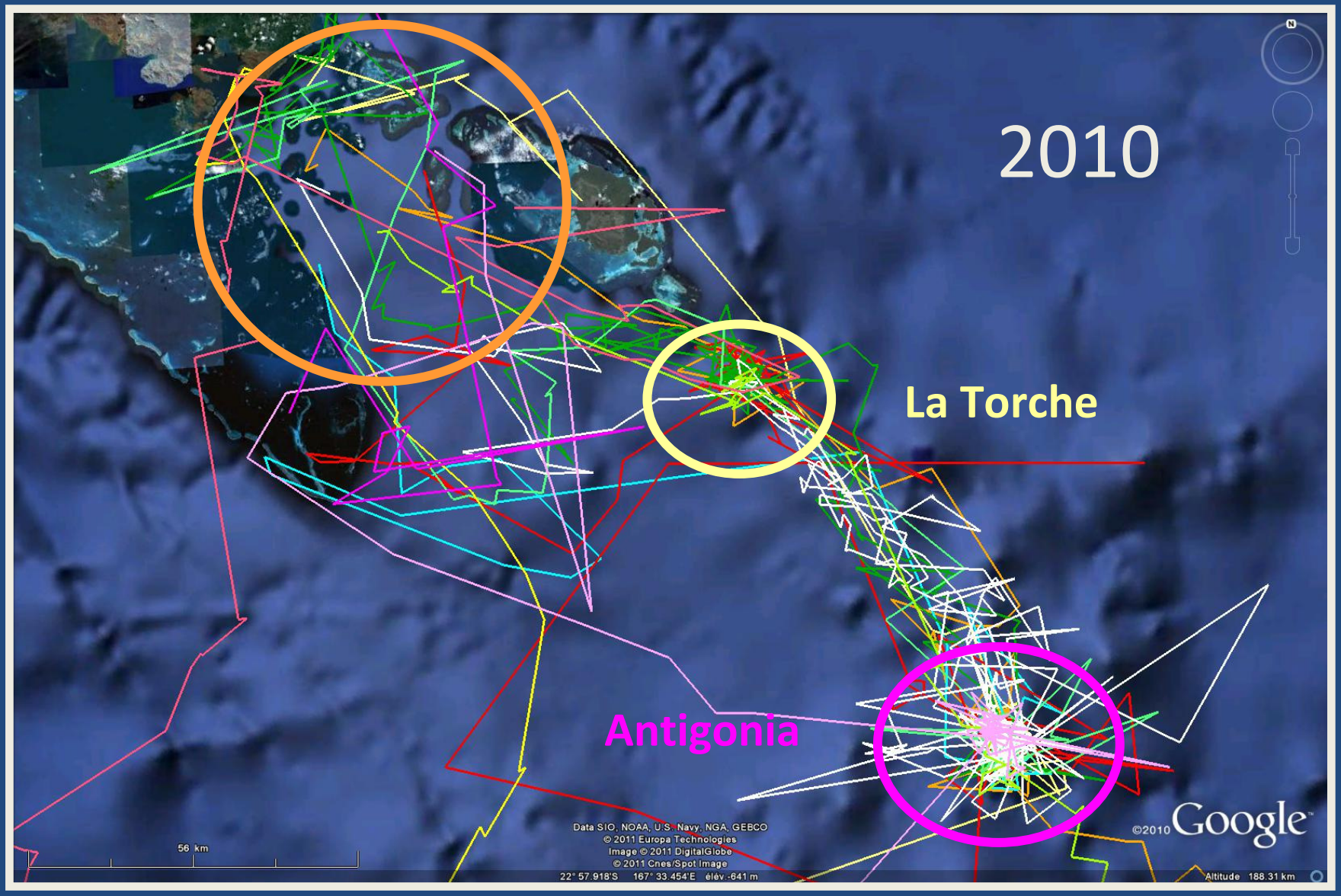
how the whale are using the reproductive area



⇨**The Southern part of the island seems more used by the humpback whales**



From: Garrigue C., Zerbini A.N., Geyer Y., Heide-Jørgensen M-P., Hanaoka W., and Clapham P. 2010 Movements of satellite-monitored humpback whales from New Caledonia. Journal of Mammalogy.

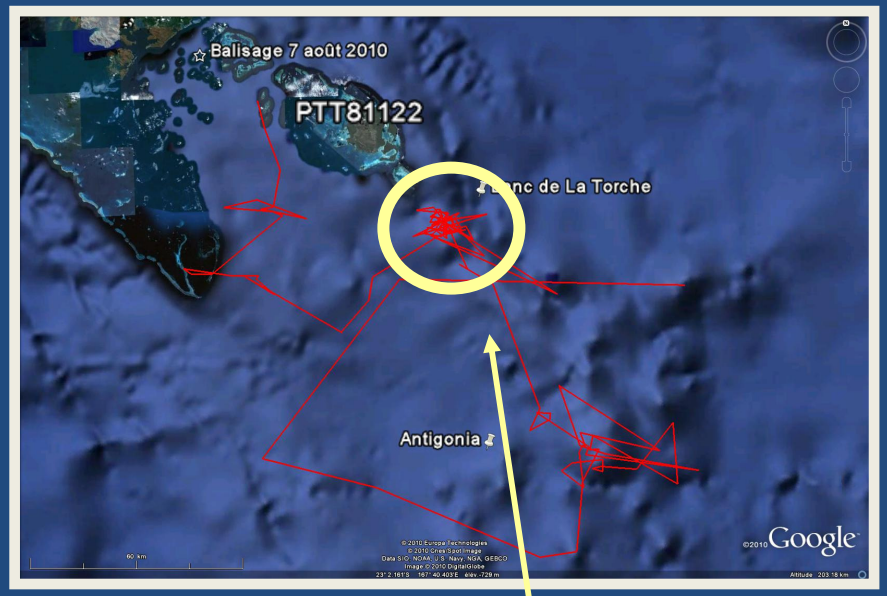


⇨In 18 of the 23 tagged whales went to the seamounts

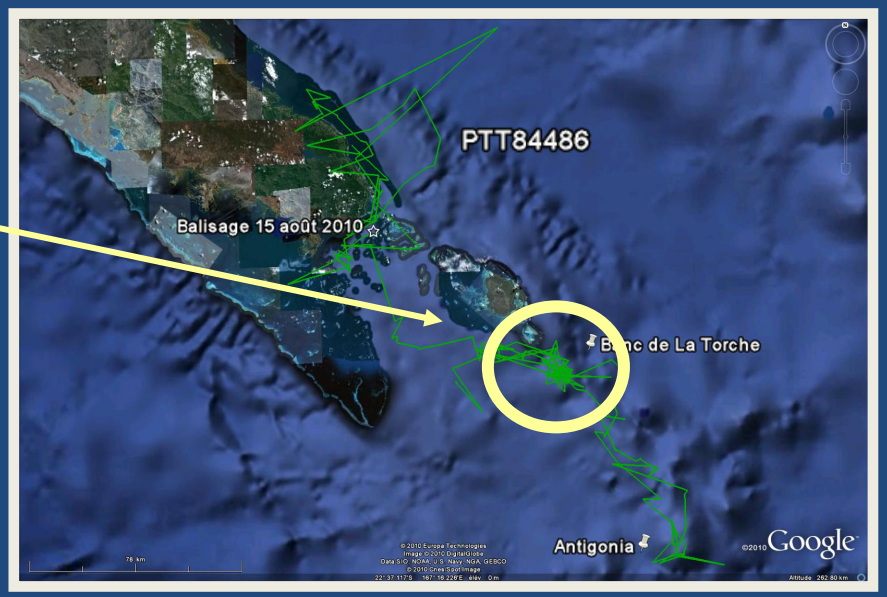
Torche Bank

Characteristics :

- **14 NM²**
- **Min depth 30m**



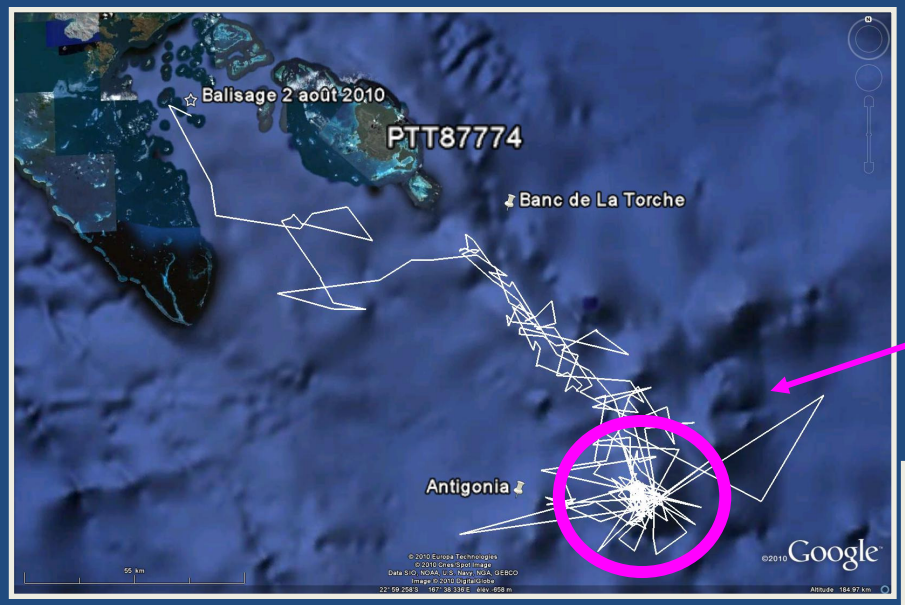
- **57% of the whales**
- **Average time = 2.1 days**
- **(CV = 1, max = 7 days)**



Antigonia seamount

Characteristics :

- **33 NM²**
- **Min depth 60m**



- **77% of the whales**
- **Average time = 7.3 days**
- **(CV=1, max = 31 days)**

⇨The amount of time spent on the seamounts suggest a considerable importance for the population

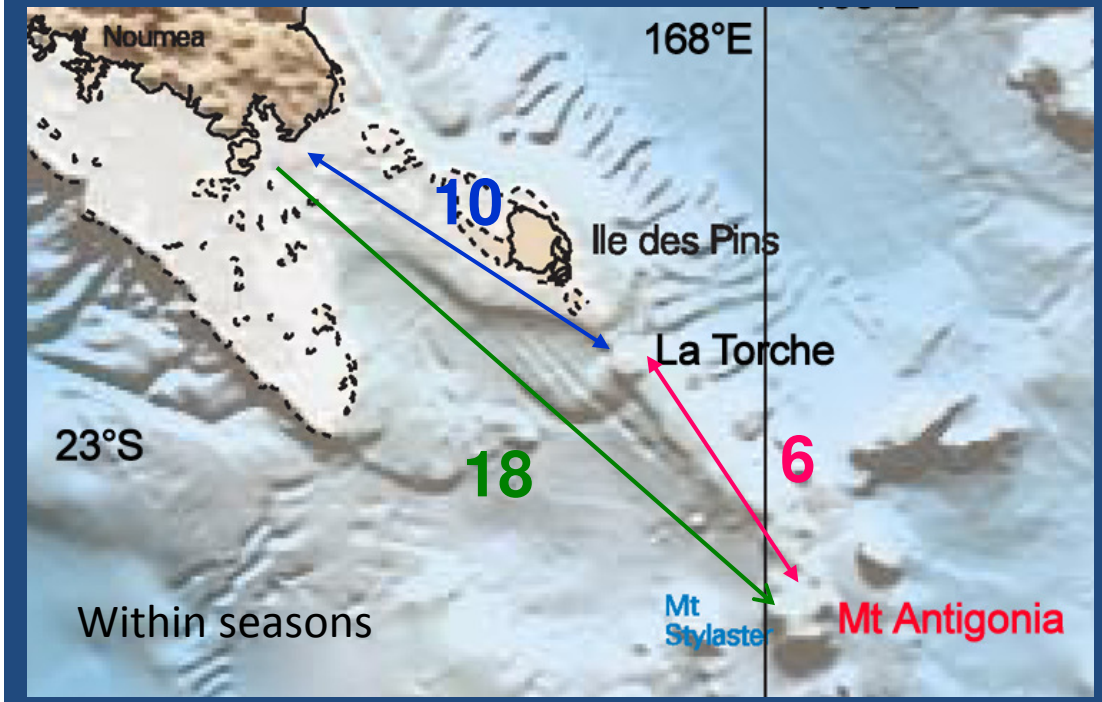
Sea surveys 2008 to 2010

Years	2008	2009		2010	
Locations	Antigonia & La Torche	Antigonia & La Torche	Southern Lagoon	Antigonia & La Torche	Southern Lagoon
# sampling days	**7**	**5**	33	**6**	35
# individual whales	**111**	**96**	92	**139**	131
daily encounter rate (#whales)	15.9	19.2	2.8	23.2	3.7
Density (whales/MN²)	**2.4**	**2.0**	**0.4**	**3.0**	**0.6**

- High encounter
- Singleton, pod of 2, competitive group, mum & calf
- Song heard 100% (n=30)

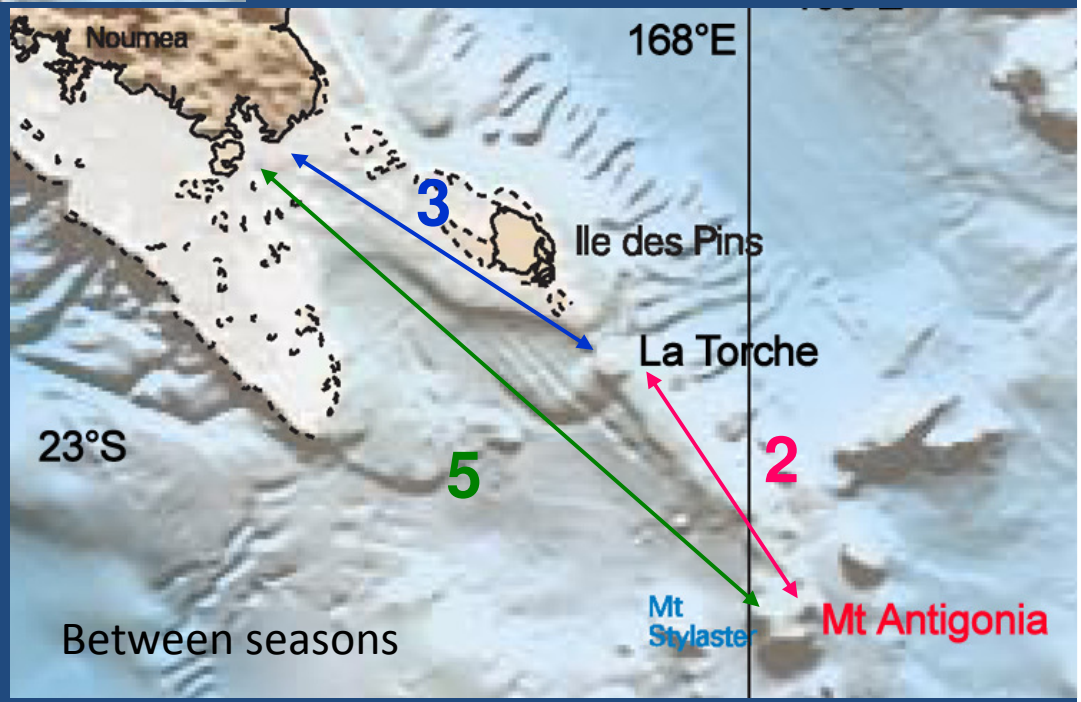
⇨ **These offshore habitats seems to be used as a breeding ground**

Individuals mouvements



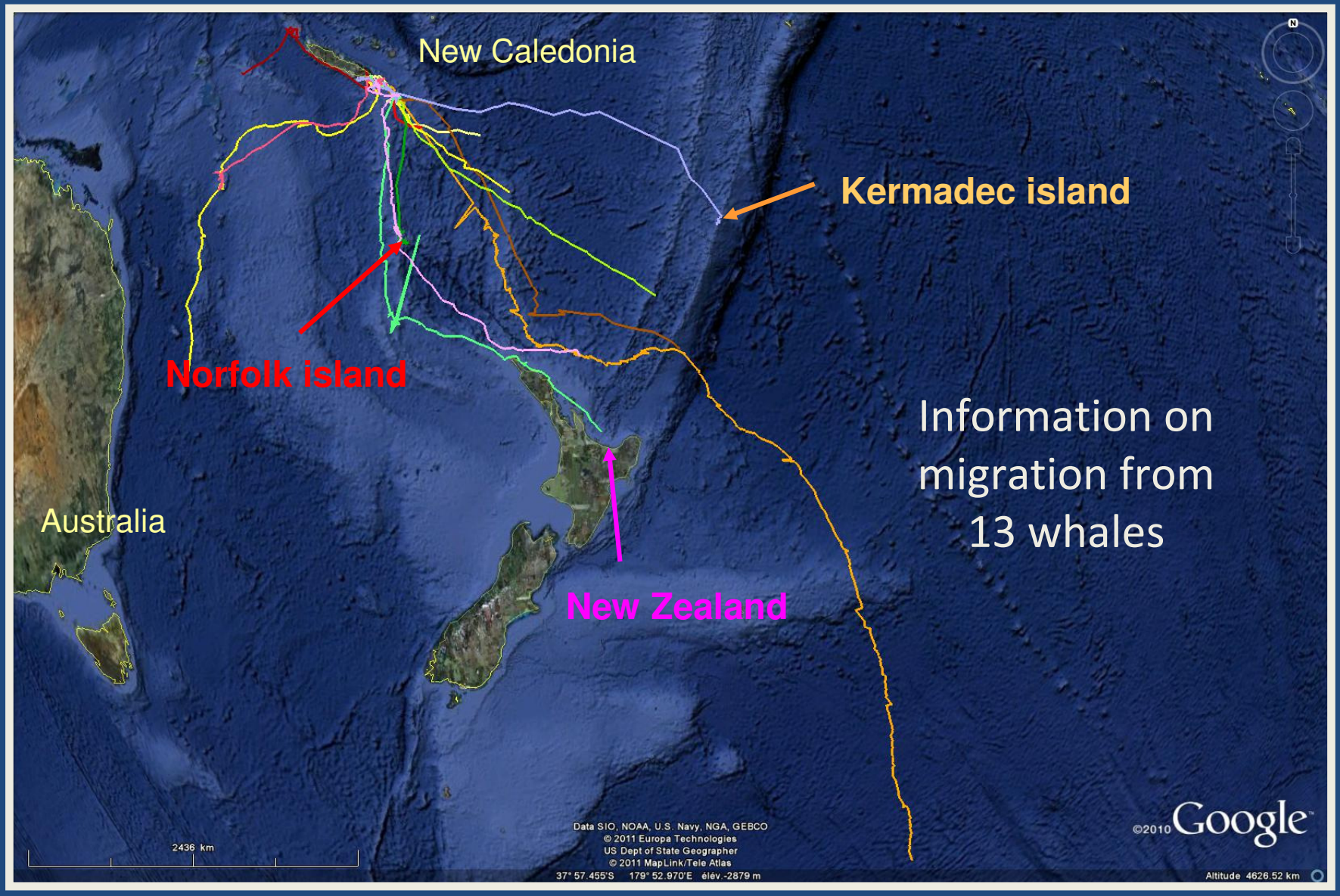
34 movements within seasons

10 movements between seasons

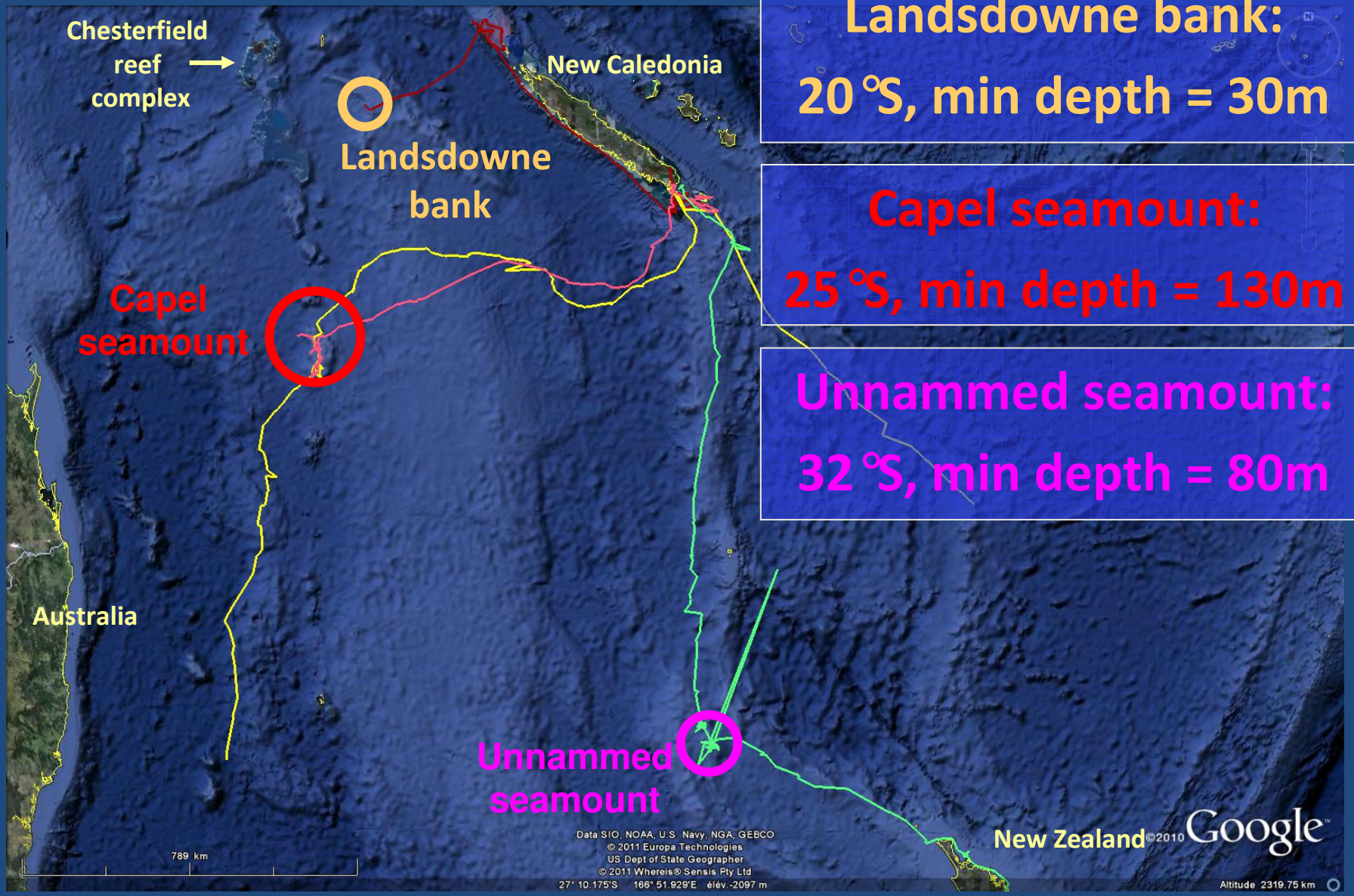


Large scale mouvement :

Where are the whale going after leaving the wintering area ?



⇨ **Migration routes and direct links highlighted**



Landsdowne bank:
20 °S, min depth = 30m

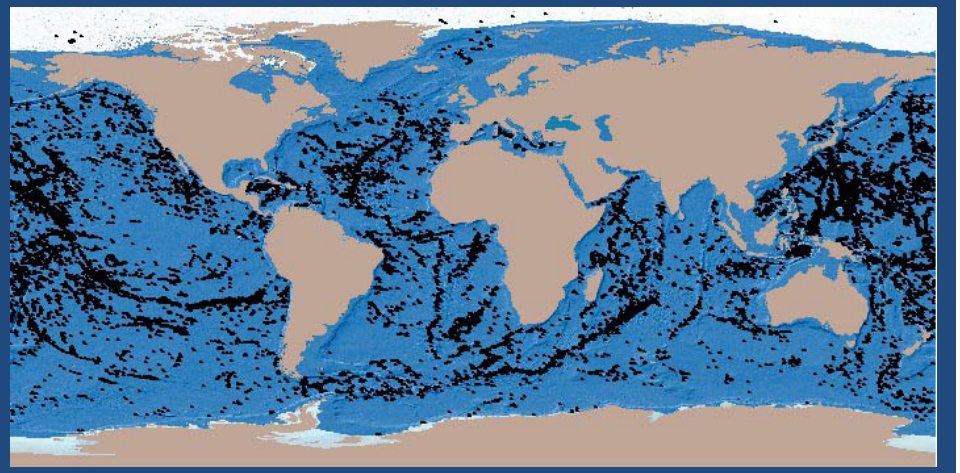
Capel seamount:
25 °S, min depth = 130m

Unnammed seamount:
32 °S, min depth = 80m

⇨ **Humpback whales use of others oceanic seamounts during their southern migration**

Conclusions

- Offshore Seamounts constitue a previously unknown type of habitat for humpback whales.
- Used for breeding purpose in low latitudes
- Could serve as landmark, resting or feeding areas in higher latitudes
- New Caledonian humpback whales are probably feeding on more than one Antarctic feeding area.
- Seamounts are important habitats for humpback whale that was overlooked.



Thank you

Our colleagues at the South Pacific Whale Research Consortium for their tireless work & great friendship.

IFAW for long-term funding of the SPWRC.

Greenpeace International then Fondation d'Enterprise Total & Total Pacifique funded the tagging in 2007 and 2010 respectively.

Many thanks to the numerous volunteers who assist in the field.

All procedures followed guidelines by the American Society of Mammalogists (Gannon et al. 2007), and research was reviewed and permitted by the administration of New Caledonia.