

Assessing the distribution and genetic diversity of Antarctic springtails (Collembola)

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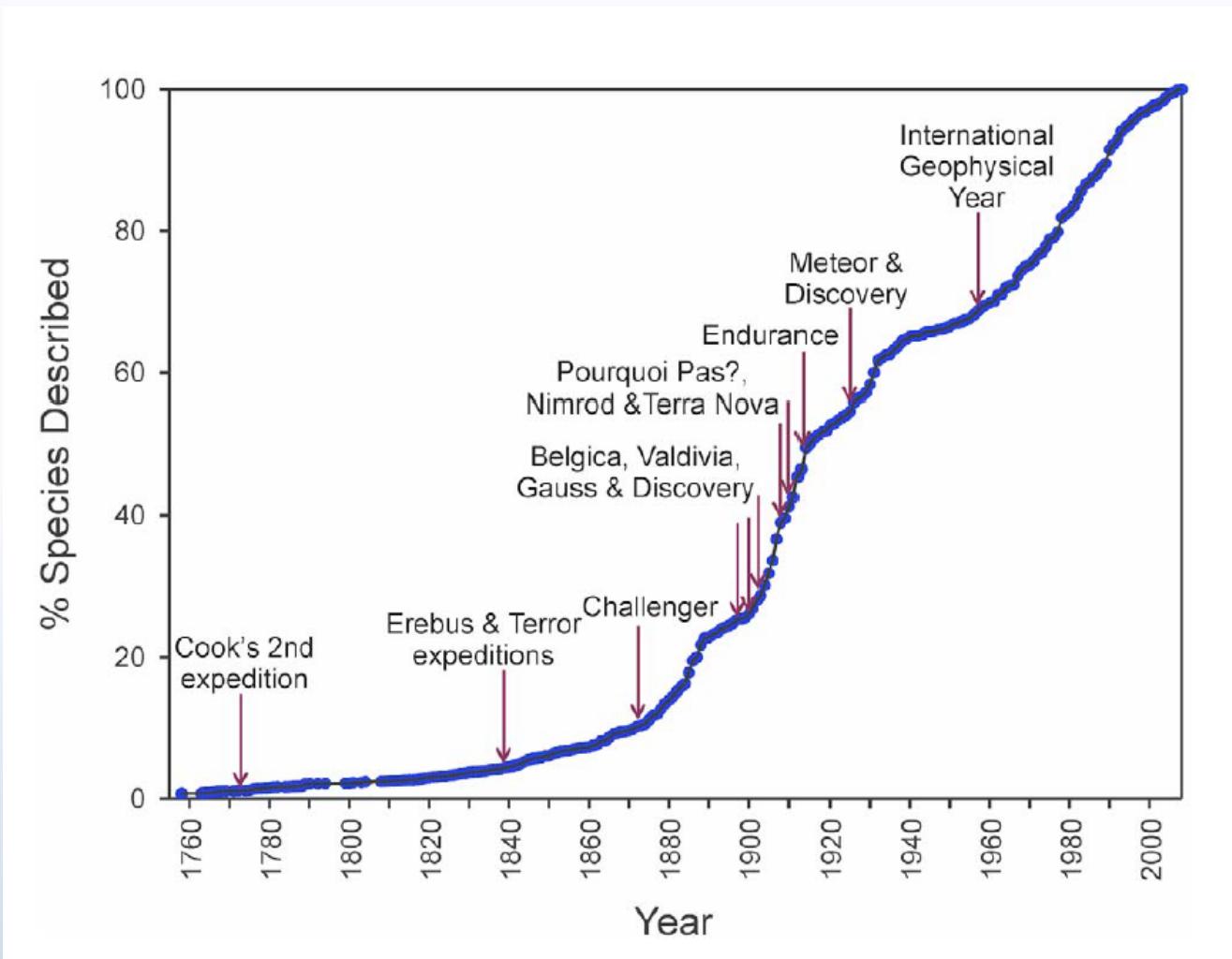
Acknowledgements



- New Zealand Antarctic Research Institute
- Environmental Research Institute Masters Scholarship
- New Zealand Post Antarctic Scholarship



Biodiversity Underestimated



Rise in described Southern Ocean marine species - Griffiths 2010, PloS ONE

Aims

Assess diversity of terrestrial Antarctic invertebrates
in the Mackay Ecotone, Ross Sea region



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To assess invertebrate responses to climate change
along the Mackay ecotone





New Zealand

Australia

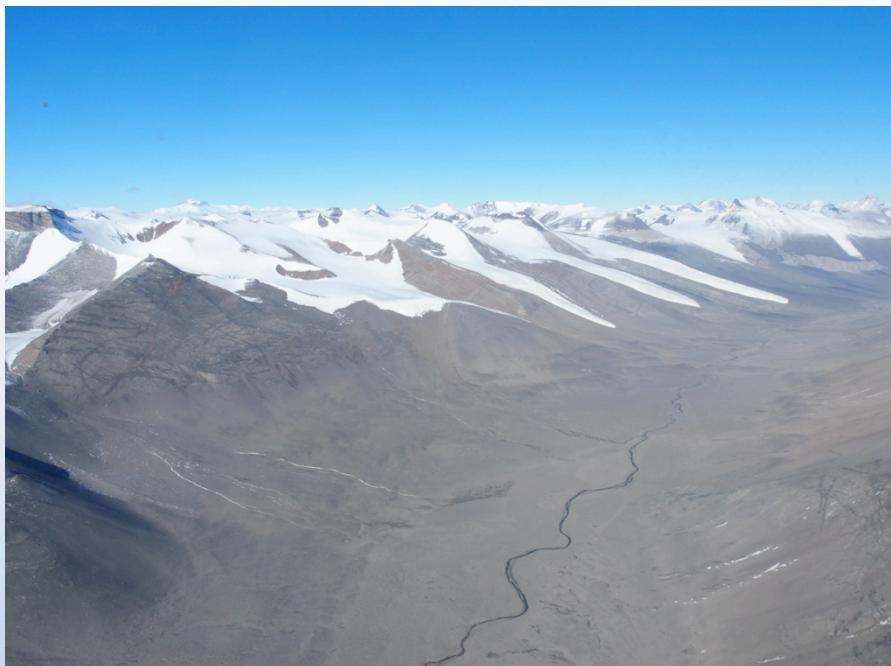
Ross

Sea

Chile

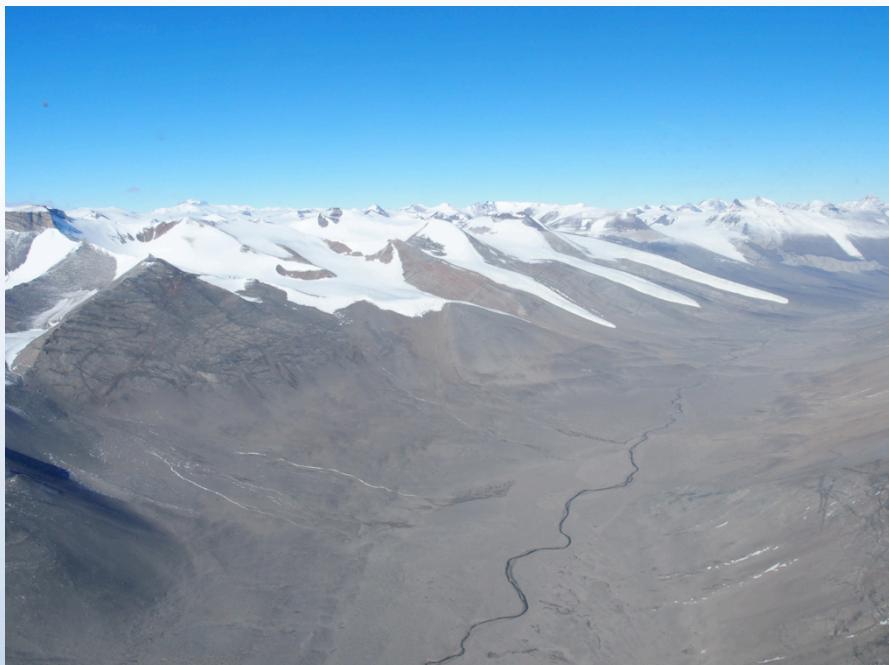
Mackay Glacier Ecotone

- Transitional zone



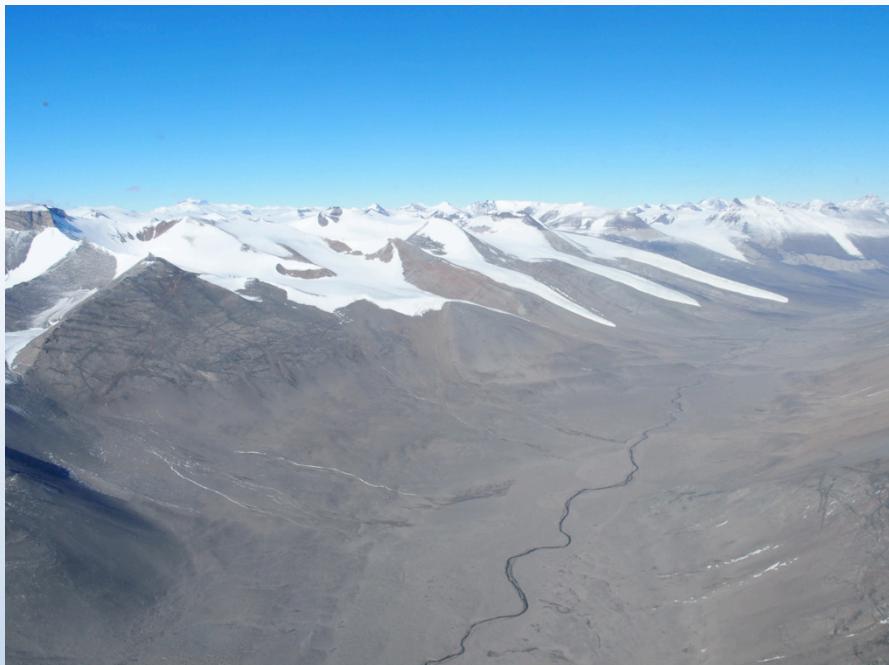
Mackay Glacier Ecotone

- Transitional zone
- Shifts in species distributions



Mackay Glacier Ecotone

- Transitional zone
- Shifts in species distributions
- ‘New’ species



Springtails (Collembola)

- Narrowest environmental tolerances

Antarcticinella monoculata *Gomphiocephalus hodgsoni* *Cryptopygus niviculus*



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Springtails (Collembola)

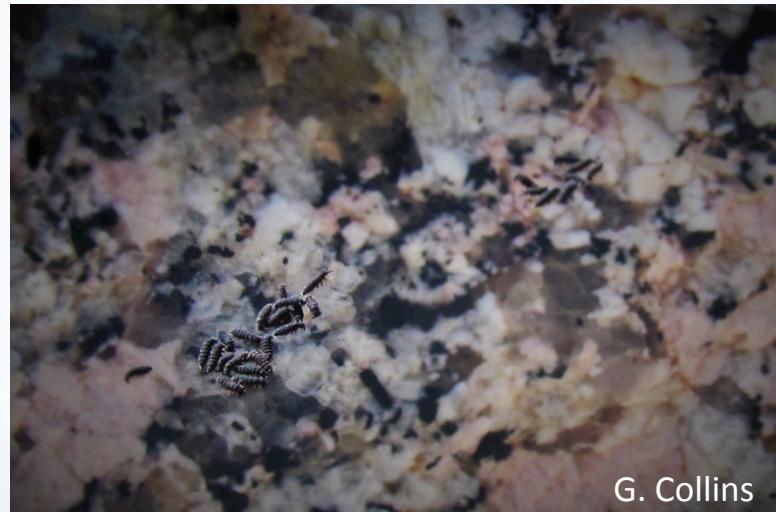
- Narrowest environmental tolerances
- 3 spp. in study area
- Limited dispersal – high genetic diversity

Antarcticinella monoculata *Gomphiocephalus hodgsoni* *Cryptopygus niviculus*



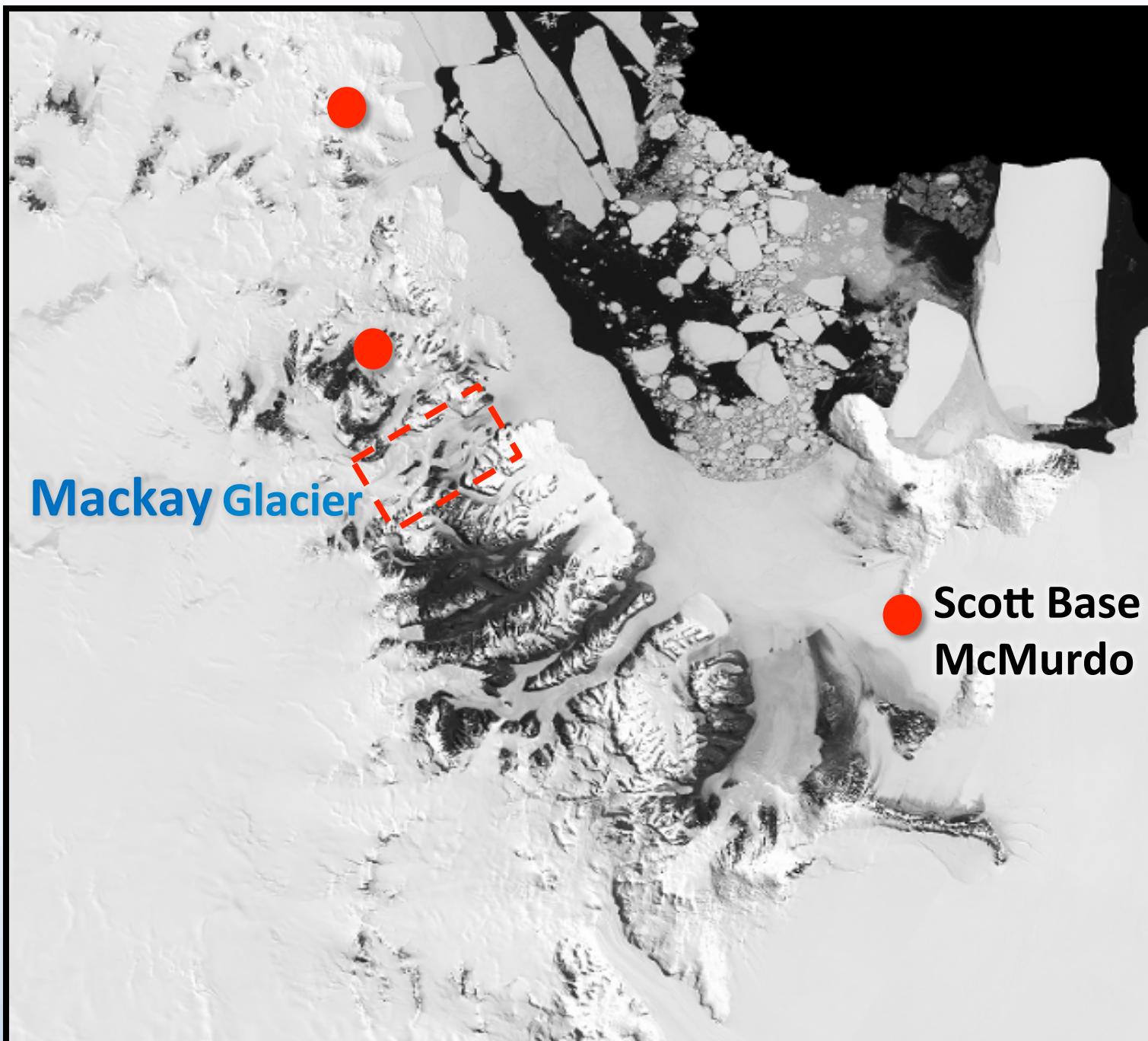
Sampling

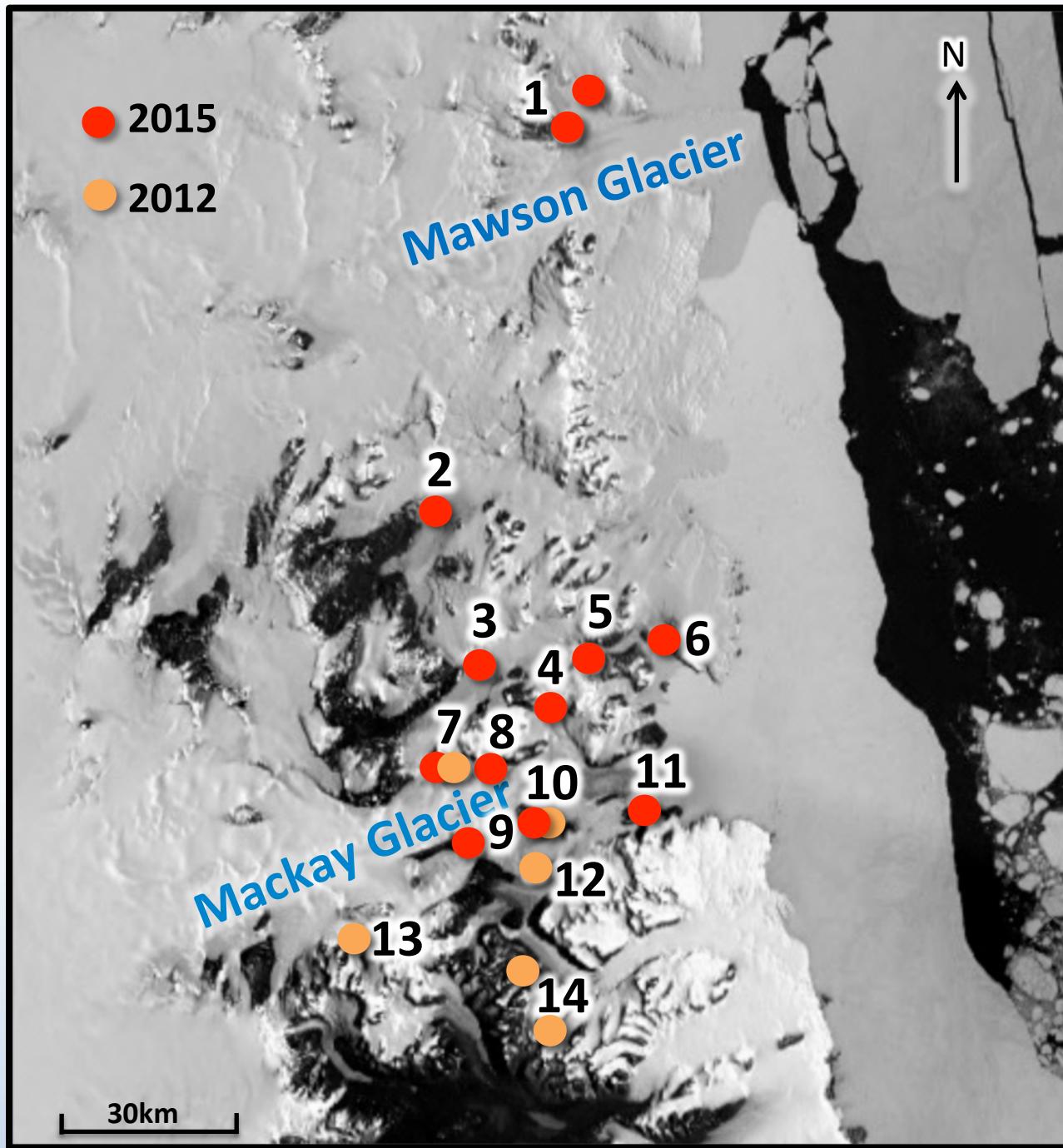
Collection: Aspiration + Soil samples

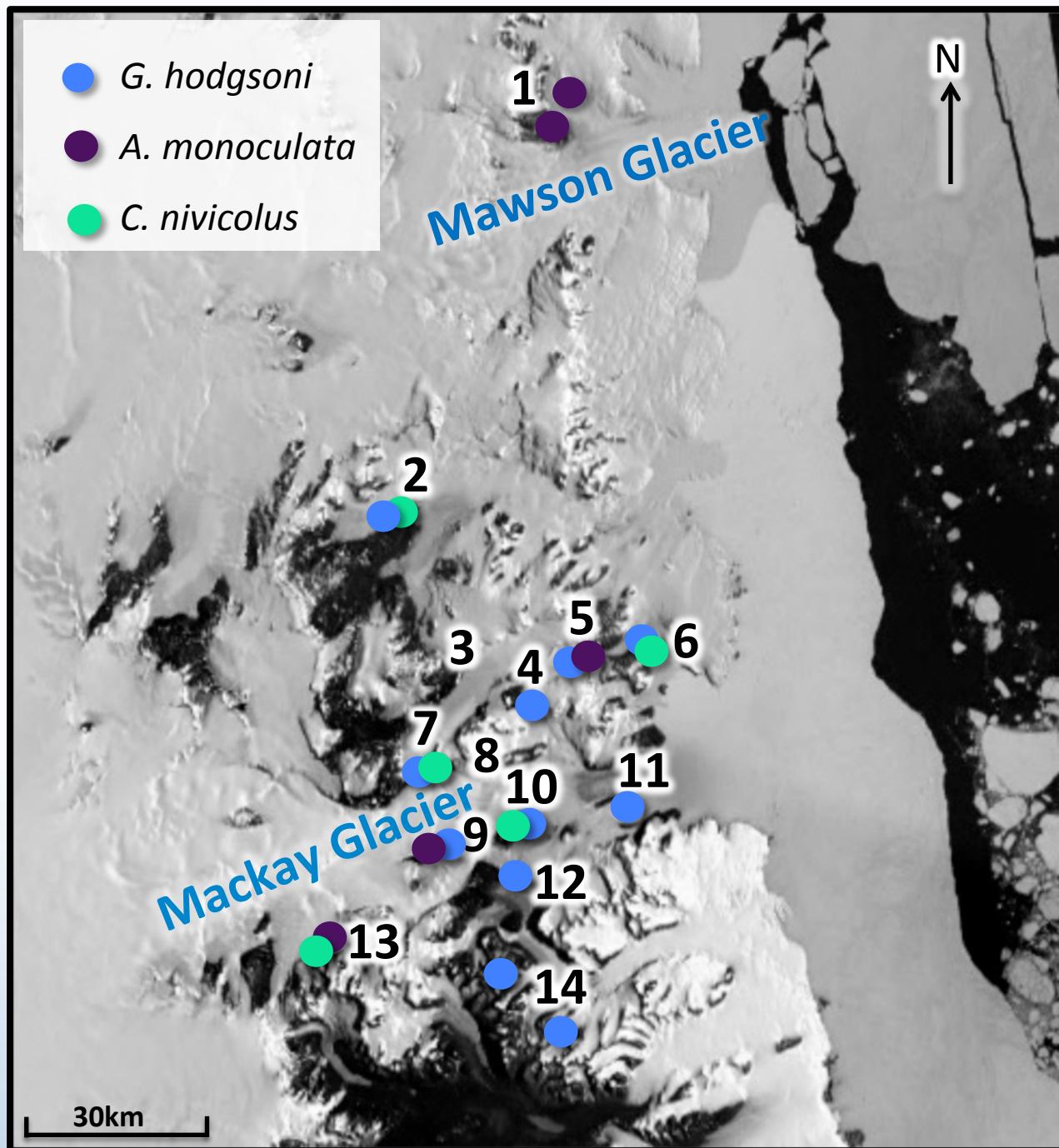


G. Collins

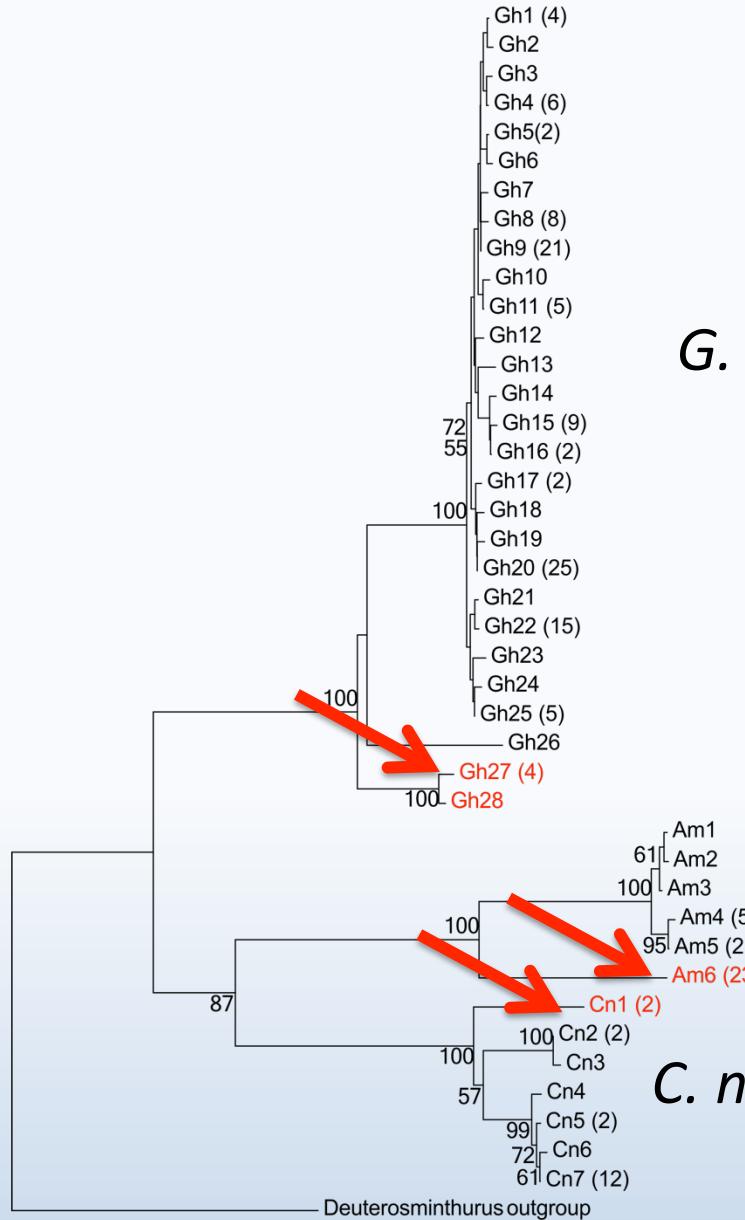
COI Sequencing of 105 springtails at CCDB







Divergent Populations



G. hodgsoni

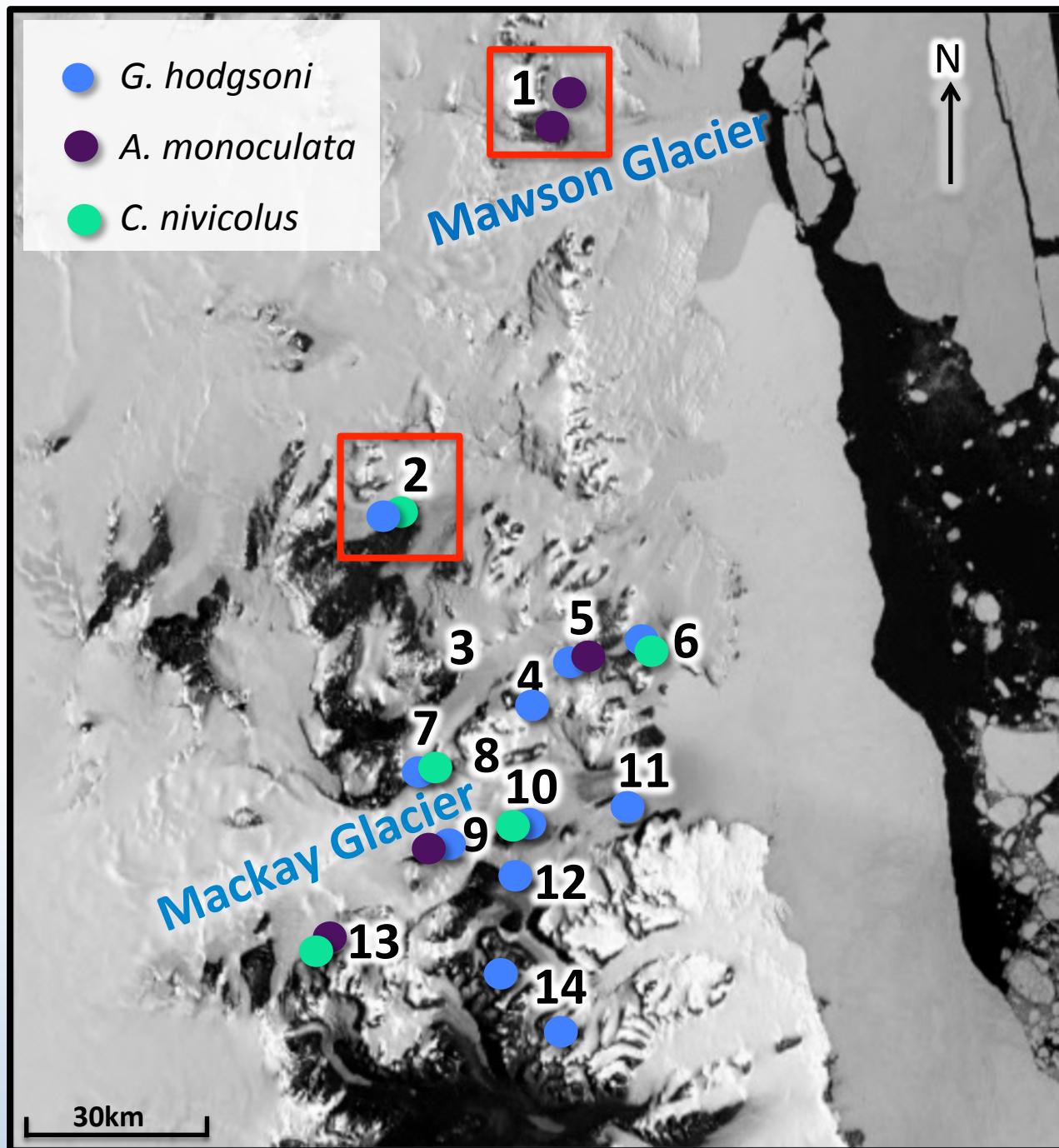


A. monoculata

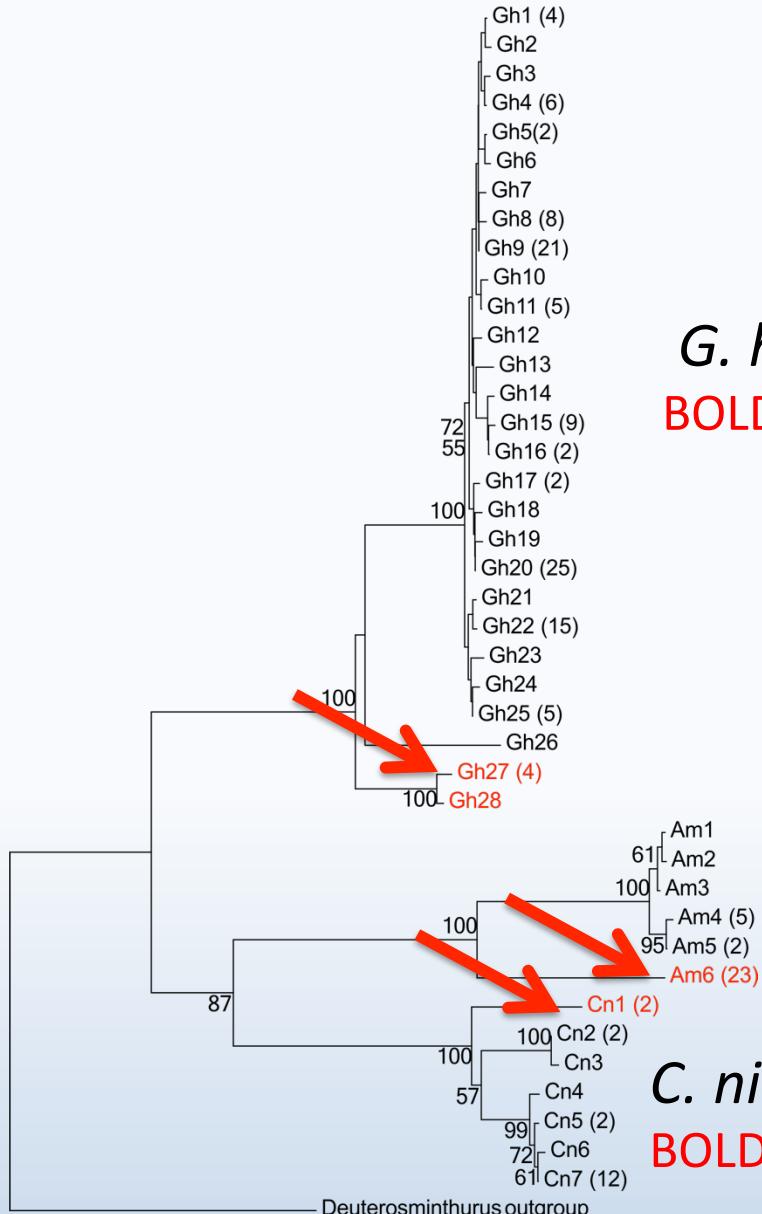


C. nivicolus





Divergent Populations



G. hodgsoni
BOLD: ACT2851



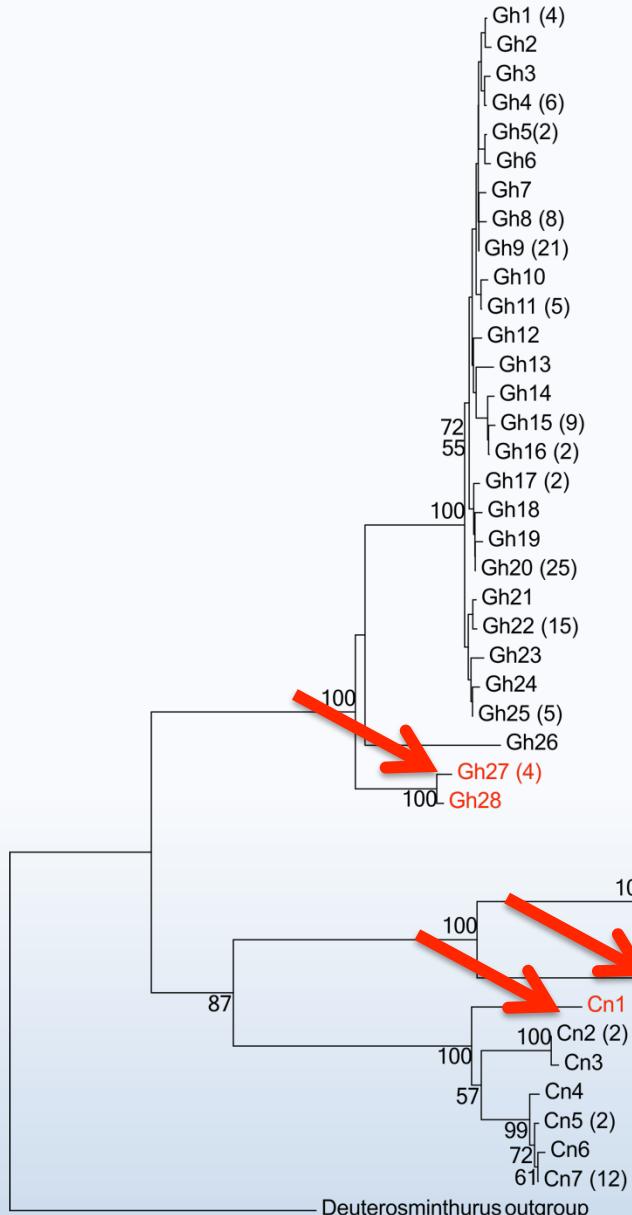
A. monoculata
BOLD: ACT2971



C. nivicolus
BOLD: ACS9977



Divergent Populations



G. hodgsoni

8%



A. monoculata

12%

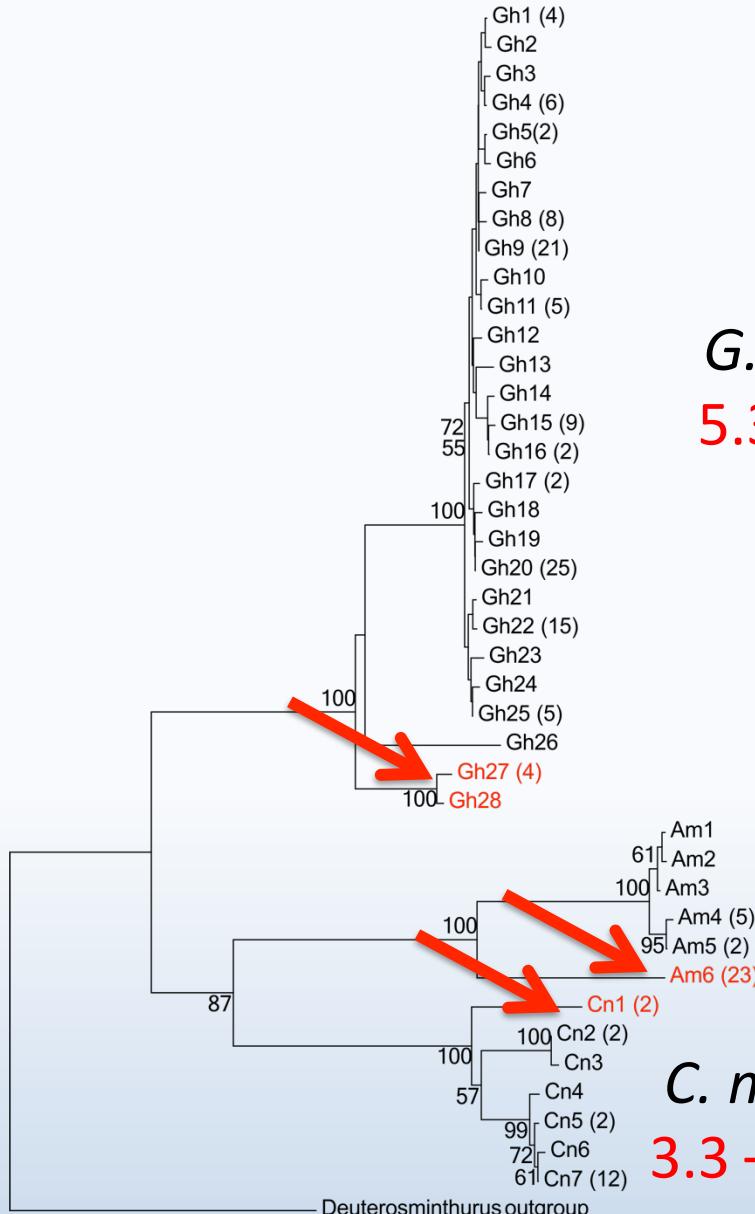


C. nivicolus

5%



Divergent Populations



G. hodgsoni
5.3 – 3.5mya

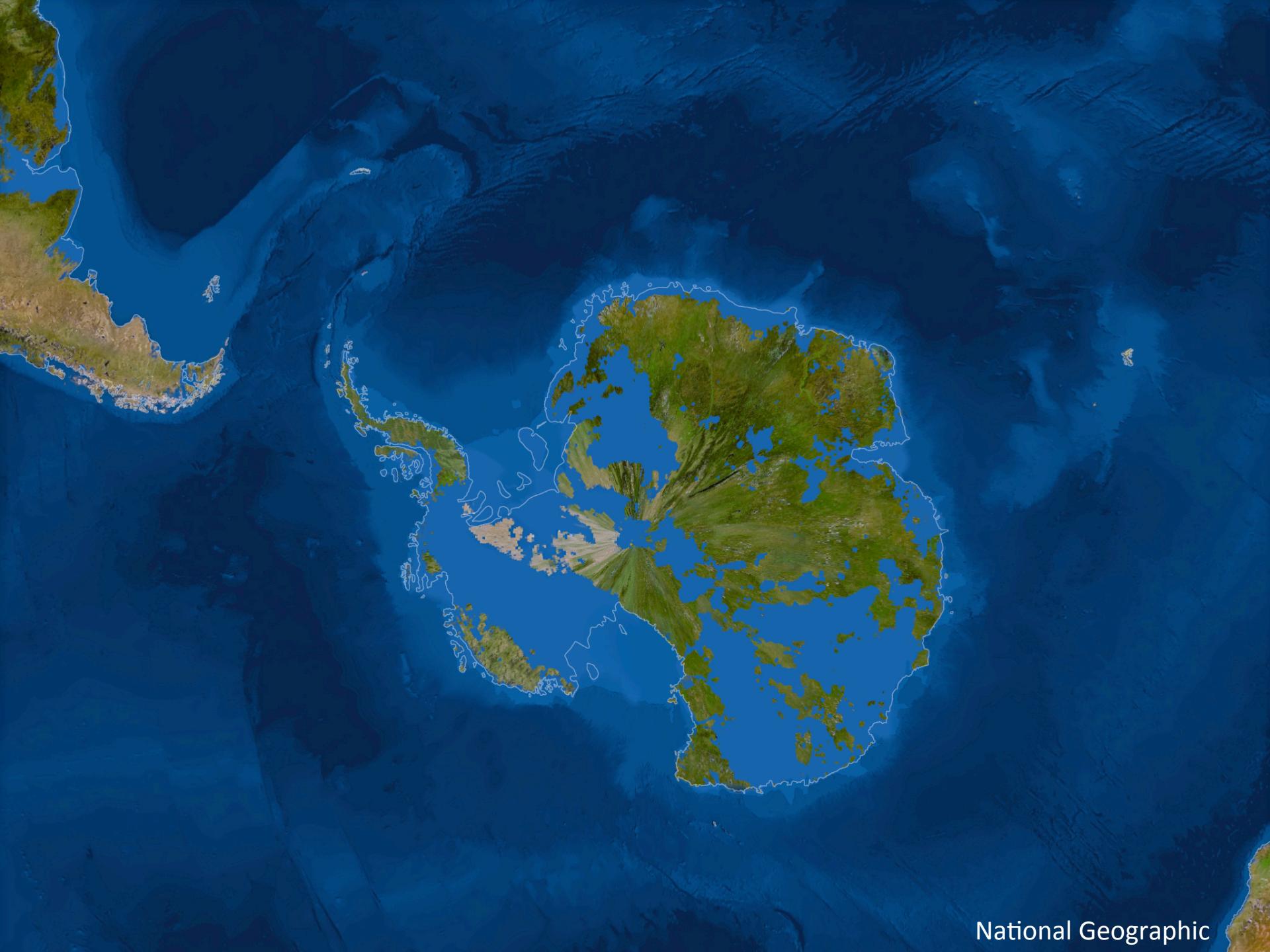


A. monoculata
8 – 5.2mya



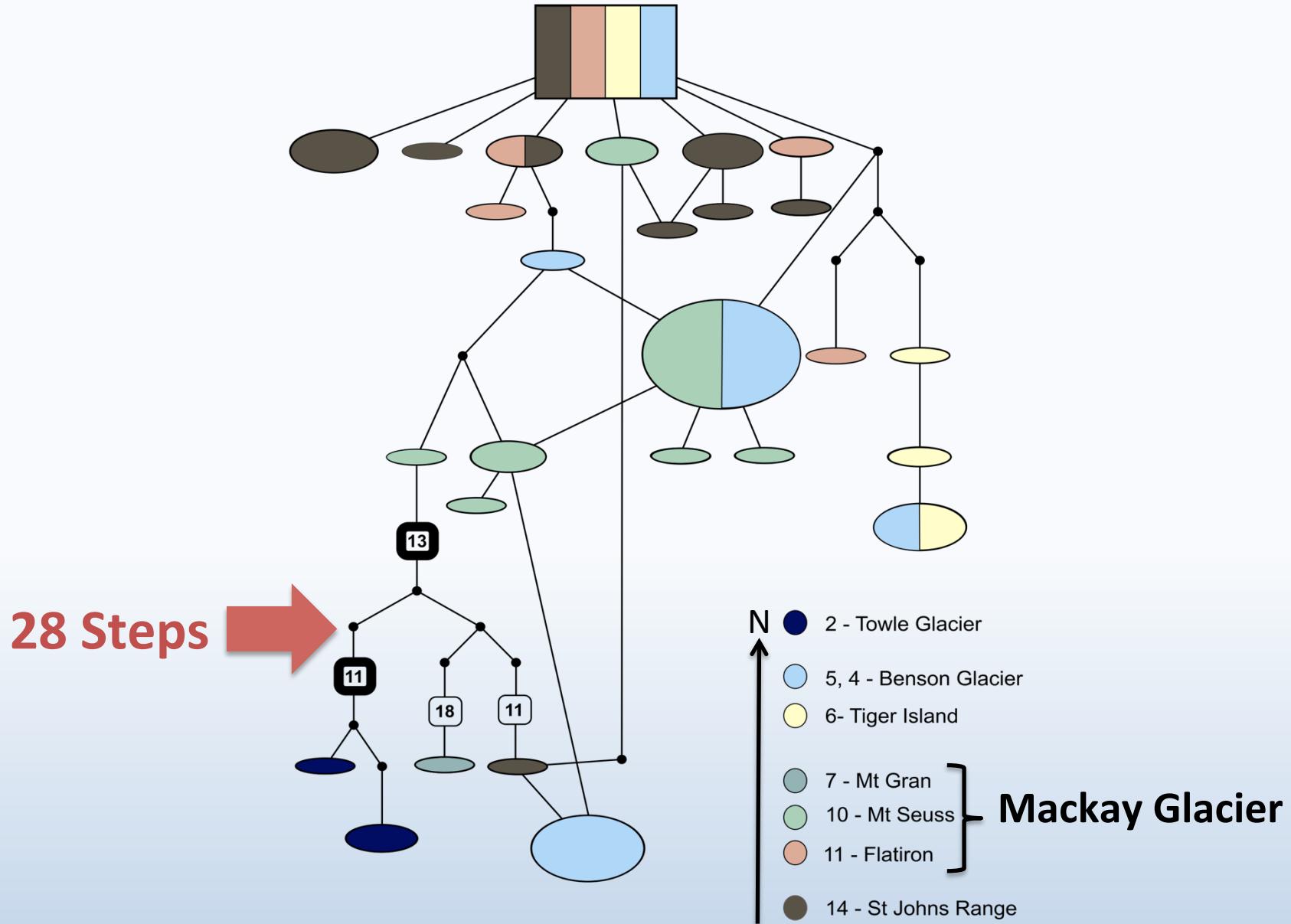
C. nivicolus
3.3 – 2.2mya



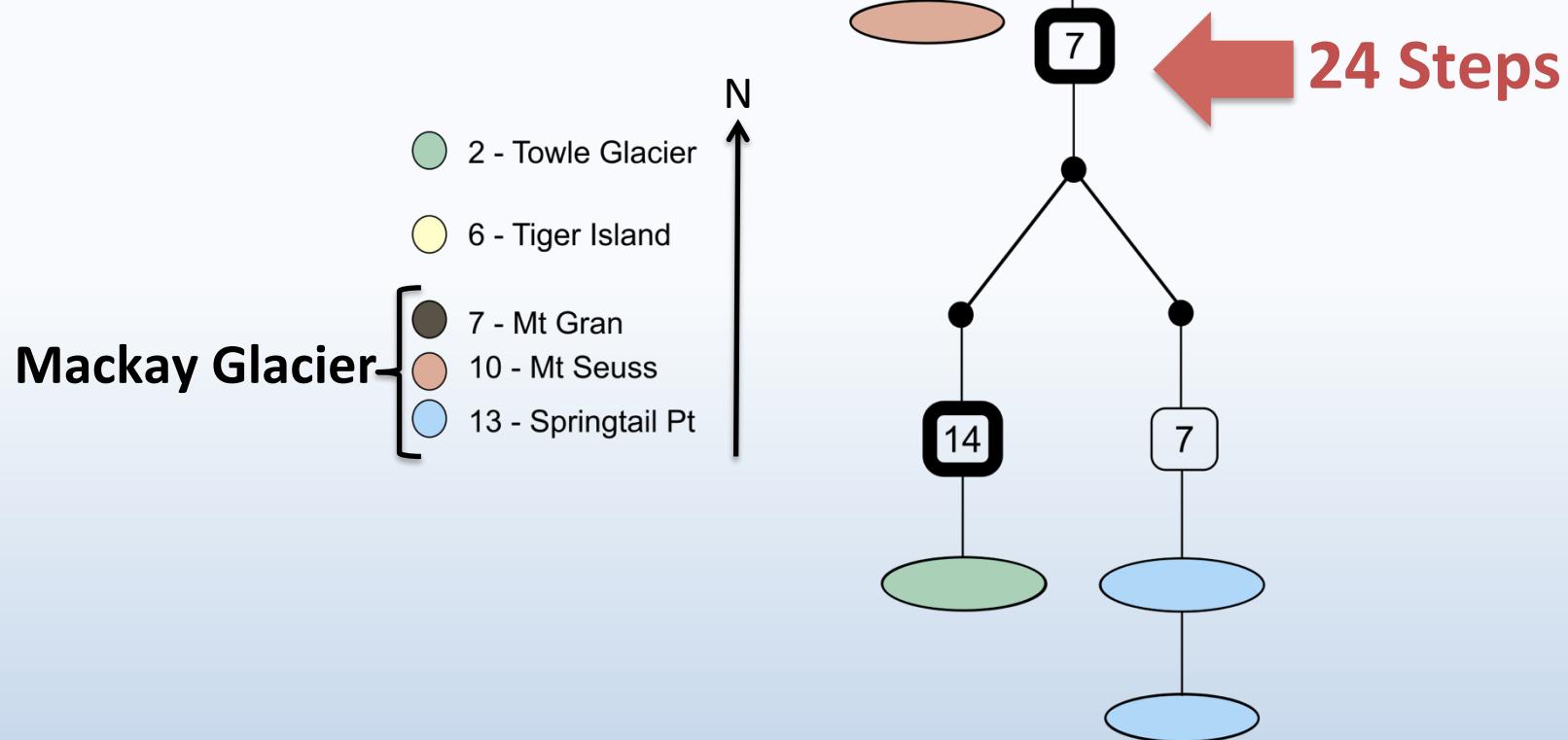


National Geographic

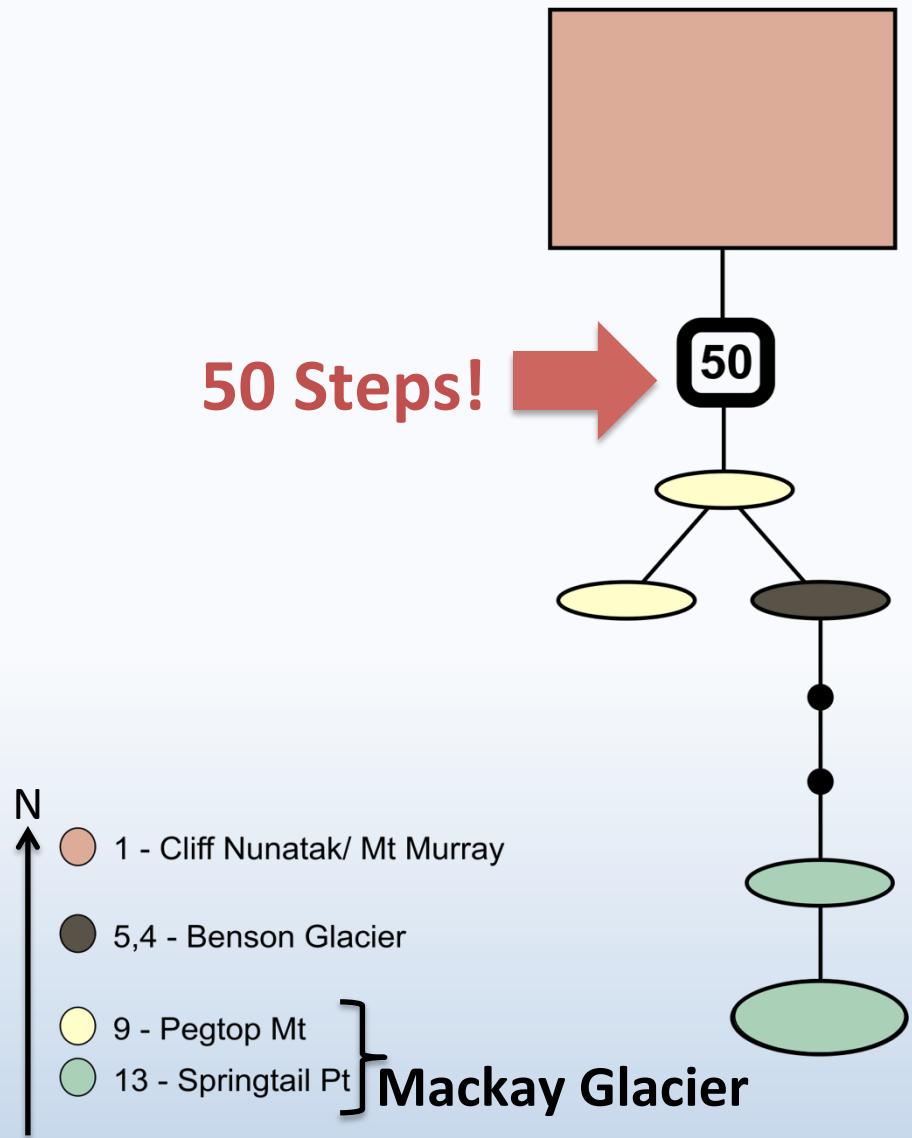
G. hodgsoni



C. nivicolus



A. monoculata



Summary

- Distinct populations
 - Potentially 3 new species

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- Track subtle distributional changes through COI haplotypes