



# NeSI HPC

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## Disciplines Supported



Biology



Engineering



Astronomy



Physics



Computer  
Science



Medical Science



Earth Science



Social Science



Mathematics

## Core Services



High Performance  
Computing & Analytics



Consultancy



Training



Data Transfer  
& Share

## Our Infrastructure



Māui



Mahulka

>136

million  
CPU core hours  
available per year

>1.7

petaflops  
peak performance

>130

GB/s  
IO bandwidth



NeSI  
New Zealand eScience  
Infrastructure



UNIVERSITY  
OTAGO  
Te Whare Wānanga o Ōtago  
NEW ZEALAND



Manaaki Whenua  
Landcare Research



MINISTRY OF BUSINESS,  
INNOVATION & EMPLOYMENT  
HEKINA WHAKATUPURI



Michael O'Brien

Jane McKee

Peter Maxwell

## Support

- Expert knowledge in multiple domains



## Consultancy

- Analysis, debug and optimization of user applications



## Training

- Software Carpentry / Data Carpentry
- Intro & advanced HPC training



# NeSI

New Zealand eScience Infrastructure



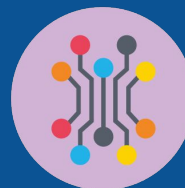
## Data transfer

- high speed data input/output
- Partnership with Globus (global data management platform)



## Hardware and software for compute and analysis

- ~700 compute nodes
- hundreds of software packages



# NeSI systems

## Mahuika:

- 8,136 cores
- 108GB mem avail per each
- 226 nodes,
- build of Intel Broadwell CPUs and FDR/EDR Infiniband

## Storage:

- 6,177 TB
- IBM Spectrum Scale
- 130 GB/s bandwidth

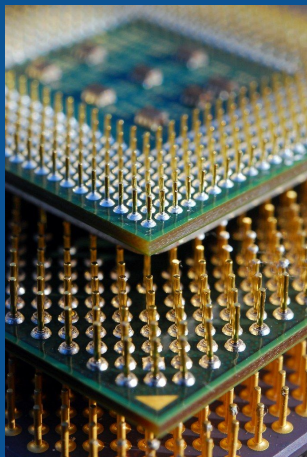
## Māui:

- 18,560 cores
- 96/192GB mem per each 464 nodes
- build of Intel Skylake CPUs and Cray Aries

# Reasons to use NeSI HPC systems:

## Compute cores

Your problem requires more compute power



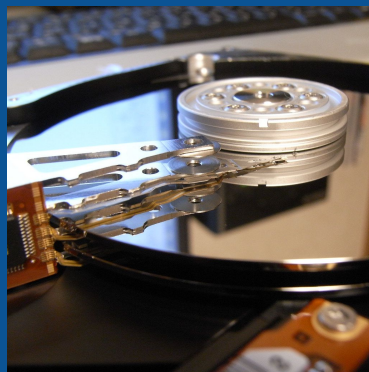
## Compute memory

Your problem does not fit in your laptop memory



## Disk space

Your problem works with data, which do not fit in your local storage



## Computer hours

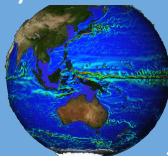
Your problem runs too long on your laptop (days/weeks)





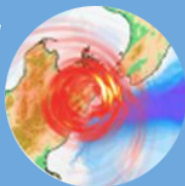
**Dr Olaf Morgenstern and  
Dr Erik Behrens (Earth Science)**

*Deep South Challenge project using  
NeSI supercomputers for climate  
modelling, incorporating regional  
and global scales.*



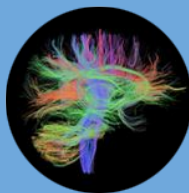
**Yoshihiro Kaneko  
(Seismology)**

*GNS Science using NeSI  
supercomputers to  
recreate earthquake  
events to better  
understand their  
processes and  
aftermath effects.*



**Dr Richie Poulton  
(Psychology)**

*Using NeSI Data  
Transfer platform to  
send MRI scan images  
from Dunedin  
Multidisciplinary Health  
& Development Study  
Research Unit to a  
partner laboratory in  
the United States for  
analysis.*



**Andrew Chen (Engineering)**

*Using NeSI supercomputers for advancing image  
processing capabilities using computer vision*



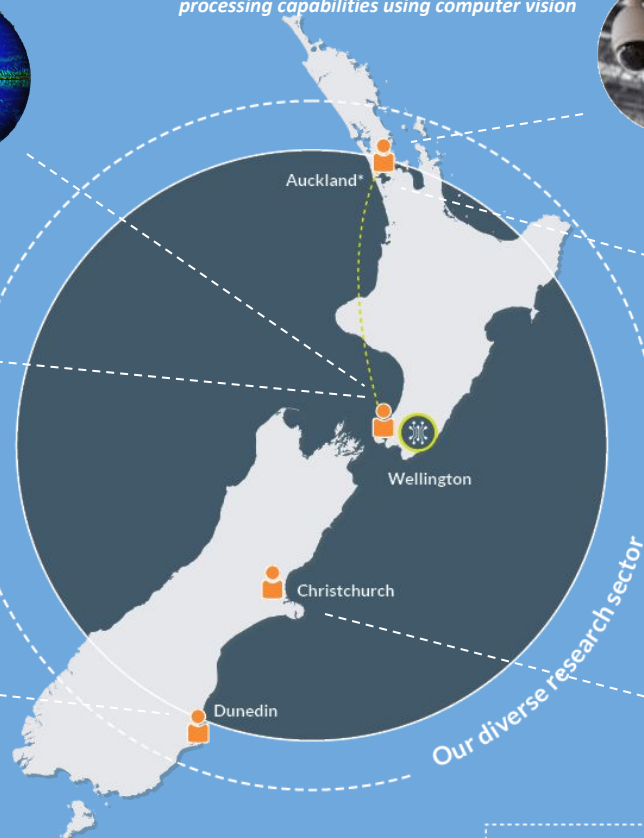
**Dr Kim Handley  
(Biological  
Sciences)**

*Genomics Aotearoa  
project using NeSI  
supercomputers to  
better understand  
environmental  
processes on a  
microbial level*



**Dr Sarah Masters,  
Dr Deborah Crittenden,  
Nathaniel Gunby (Chemistry)**

*Using NeSI supercomputers to  
develop new analysis tools for  
studying molecules' properties.*



# Eligible for access

commercial  
contracts



Researcher from

- NIWA
- University of Otago
- University of Auckland
- Manaaki Whenua - Landcare Research



Funded research by

- institutional,
  - regional or
  - national
- peer-reviewed  
grant or contract



Post graduate student  
research for degree



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# Questions and Answers



If you are interested in gaining access to NeSI HPC resource or have any additional questions, visit [support.nesi.org.nz](https://support.nesi.org.nz)