



NeSI Consultancies- Evolving a Scientific Programming Service

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New Zealand eScience Infrastructure

Overview

1. NeSI Consultancies– Facts and Figures
2. Evolution of the Service
3. The Future
4. Summary



Facts and Figures

Facts and Figures

In the last 3 years, we worked...

>70

Consultancy
Projects

>6000

Consultancy
Hours

>16

Fields of
Science

12

NZ
Institutions

Facts and Figures

The Team



Chris Scott

Research Software Engineer,
University of Auckland



Alexander Pletzer

Research Software Engineer,
NIWA



Wolfgang Hayek

Research Software Engineer,
NIWA

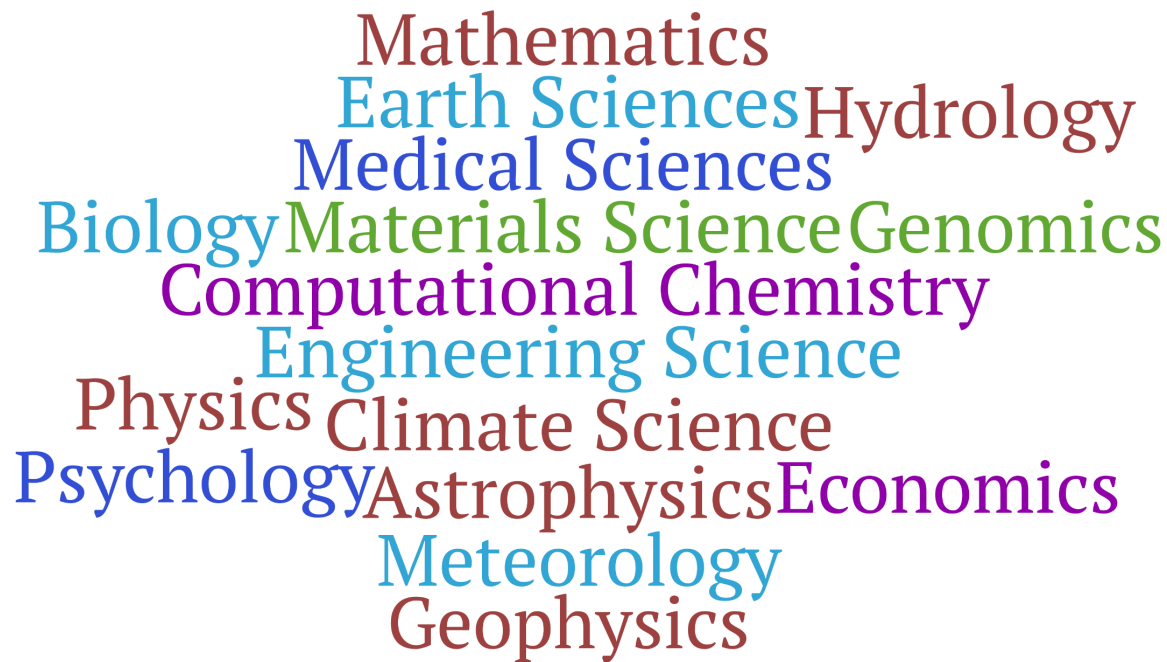


Maxime Rio

Data Science Engineer,
NIWA

... and many others at NeSI...

Facts and Figures



A word cloud of scientific disciplines arranged in a diamond shape. The words are color-coded and vary in size. The disciplines included are: Mathematics, Earth Sciences, Hydrology, Medical Sciences, Biology, Materials Science, Genomics, Computational Chemistry, Engineering Science, Physics, Climate Science, Psychology, Astrophysics, Economics, Meteorology, and Geophysics.

Mathematics
Earth Sciences Hydrology
Medical Sciences
Biology Materials Science Genomics
Computational Chemistry
Engineering Science
Physics Climate Science
Psychology Astrophysics Economics
Meteorology
Geophysics

Facts and Figures

A word cloud of eScience-related terms arranged in a diamond shape. The words are: Testing (light blue), Version Control (dark red), Code Optimisation (dark blue), Feature Development (green), Collaborative Work Practice (purple), Runtime Optimisation (light blue), Model Development (dark red), Skills Transfer (light blue), and Visualisation (dark red). The words are stacked vertically, with 'Testing' at the top and 'Visualisation' at the bottom. The colors of the words are: Testing (light blue), Version Control (dark red), Code Optimisation (dark blue), Feature Development (green), Collaborative Work Practice (purple), Runtime Optimisation (light blue), Model Development (dark red), Skills Transfer (light blue), and Visualisation (dark red).

Testing
Version Control
Code Optimisation
Feature Development
Collaborative Work Practice
Runtime Optimisation
Model Development
Skills Transfer
Visualisation



Evolution of the Service

The background

“Better software, better research” (Software Carpentry)

“The free lunch is over” (common saying...)

“Computers become fatter, not faster” (PASC21 Conf.)

- HPC remains a challenge for many users
- Technical complexity increases
- Need to use HPC efficiently
- Training in essential skills and work practice needed
- Increasing attention paid to robustness and reproducibility of software and results– “second pair of eyes”

Consultancy Process– Key Points

- Initial meet-up for scoping an application
- Agreement on *realistic* goals and milestones
- Project acceptance mainly based on eligibility, prioritisation, and whether we can add value
- Soft prerequisites– version control and tests
- Aspects of agile project management sprints, customer meetings
- Scientists need to take full ownership of all code

Data Science– “New” kid on the block

- How to define Data Science...
 - “[...] extract knowledge and insights from [...] data” (Wikipedia)
- Both fundamental research and applications in Aotearoa New Zealand
- Growing number of projects that use NeSI
- Large need for upskilling in tools and methods
- Deeper involvement in projects, not just infrastructure



The Future

The Future

Attracting Projects

- Key problem!
- Researchers often don't know about the service
- How to reach “non-traditional” disciplines?
- Need to find better ways to advertise!
- Difficult to balance demand, available hours, and entitlements

The Future

Consultancy Service What's in a name?



pngmart.com



favpng.com



wikipedia.org

Associations... Should we rename the service?

The Future

Challenges



How to use a rapidly growing tool scape effectively?

The Future

Evolving the service further

- Adapt to changing needs...
- Accept longer projects (>3 months)
 - Enables more complex work
 - Resource issues
 - Requires careful planning
- Getting more involved in the underlying science
 - Current focus mostly on infrastructure
 - Increasing scope (e.g., data science)
 - Often requires longer projects
 - Co-authorship?



Summary

Summary

- Successful and well-established consultancy service
- Well-working process established based around community needs, experience, and feedback
- Growing support for data science
- Further evolution needed to respond to changing needs, tools, and RSE best practice

NeSI @ eResearch NZ Talks & Workshops:



Wednesday 10 Feb

13:00 - 17:00 - Maxime Rio - Machine Learning on NeSI 101

13:20 - 13:40 - Jun Huh - Taonga: building a data repository for genomics research in New Zealand

13:20 - 13:40 - Dinindu Senanayake - Paving the way for Bioinformatics excellence in New Zealand

14:20 - 15:00 - Brian Flaherty - Moving data: getting up to speed with Globus and Science DMZ

15:50 - 16:50 - Jana Makar - Challenge Accepted: Responding to community feedback for supporting diversity in HPC & eResearch

Thursday 11 Feb

11:00 - 11:20 - Maxime Rio - Data science consultancies at NeSI: A whirlwind tour of case studies

13:30 - 13:50 - Chris Scott - GPUs on NeSI

13:50 - 14:10 - Georgina Rae - Building Partnerships for eResearch

14:10 - 14:30 - Wolfgang Hayek - NeSI Consultancies - Evolving a Scientific Programming Service

14:40 - 15:00 - Albert Savary - Software on NeSI

15:00 - 15:20 - Jeff Zais - Taking Advantage of Technology Innovations in the Next Generation of NeSI HPC Infrastructure

15:20 - 15:40 - Callum Walley - Virtual Desktops for HPC

Thursday 11 Feb (cont.)

15:20 - 15:40 - Robin Bensley - Staying connected in an evolving eResearch ecosystem

16:00 - 17:00 - Megan Guidry - Sowing the seeds of capability: Experience what Carpentries instructor training is all about

Friday 12 Feb

11:20 - 12:30 - Nick Jones - Future of eResearch

12:20 - 12:30 - José Filipe Gonçalves Higino - Coaching great practices of describing a problem

13:30 - 14:30 - Blair Bethwaite - Embracing cloud-native architectures

13:30 - 14:30 - Alexander Pletzer and Nooriyah Lohani - Who needs research software engineers?

13:30 - 14:30 - Georgina Rae - FAIR for Research Software



NeSI

New Zealand eScience
Infrastructure



NZ Research Software Engineers Conference

Spring 2021

Help us plan the programme!
Email events@nesi.org.nz to get involved.

Who attends:

- Researchers and academics who code
- Software engineers & system admins working in the research domain
- Generalists who bring together the research and technical domains
- Developers, IT managers, coding enthusiasts, and big data analysts from Crown Research Institutes, universities, and other public sector organisations



Thanksfor listening!