Revealing the invisible

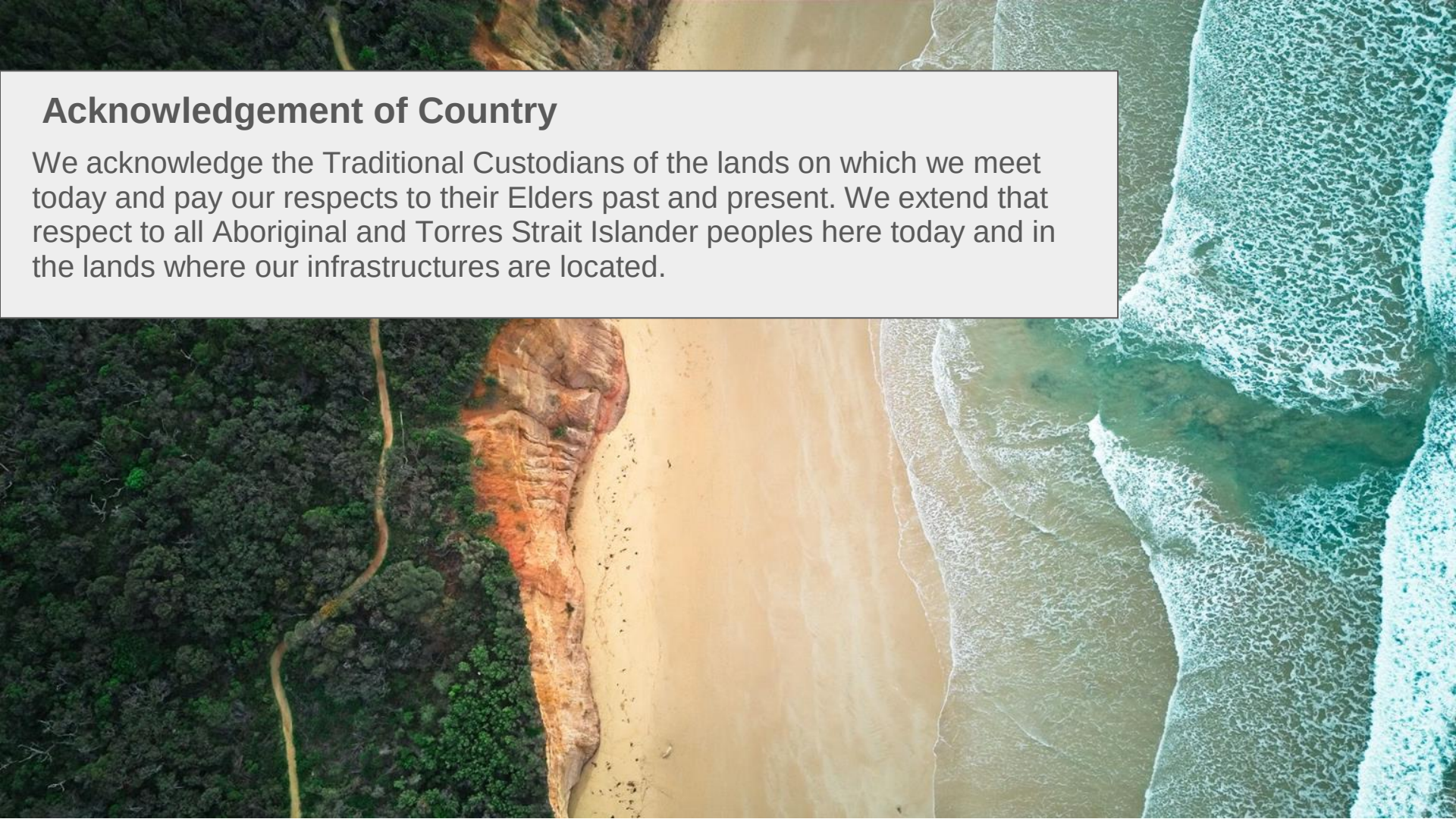
The challenge of measuring and communicating the impact of research infrastructures

Birds of a Feather - eResearch Australasia 2024

ACCESS National Research Infrastructure
AUSTRALIAN ACCESS FEDERATION
AURIN aurin.org.au
Australian BioCommons
AuScope
NCI AUSTRALIA
ARDC Australian Research Data Commons
NCRIS National Research Infrastructure for Australia
An Australian Government Initiative

Acknowledgement of Country

We acknowledge the Traditional Custodians of the lands on which we meet today and pay our respects to their Elders past and present. We extend that respect to all Aboriginal and Torres Strait Islander peoples here today and in the lands where our infrastructures are located.



Who is here

Convenors: 7 Research infrastructures:

- **Australian ACCESS Federation (AAF): Kerry Mora**
- **Australia's climate simulator (ACCESS-NRI): Natalia Bateman and Kelsey Druken**
- **Australian Urban Research Infrastructure Network (AURIN) : Emma Joughin**
- **Australian Geoscience Research Infrastructure (AuScope): Philomena Manifold**
- **Australian BioCommons: Christina Hall**

Invited speakers:

- **Australian Research Data Commons (ARDC): Liv Shanahan**
- **National Computational Infrastructure (NCI): Jo Croucher**

Who is here

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National Research Infrastructure for Australia
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YOU! Please tell us a little about you and we'll share the BoF outcomes https://pollev.com/christinah

Expected outcomes: BoF deliverable is a report - invitation to contribute to writing

Overview of the session

Agenda

1. Setting the scene: how do we define impact and why do we care
1. Measuring impact: lightning talk AAF (3 min) + discussion (10 min)
1. Communicating impact: Lightning talk BioCommons (3 min) + discussion (10 min)
1. Evaluating impact: Lightning talks invited ARDC (2 min) NCI (2 min) + discussion (10 min)
1. Summary and Wrap-up

Aims

- Showcase different ways national research infrastructures have approached the challenge of **measuring**, **evaluating** and **communicating** their multifaceted impacts.
- Discuss the best way of articulating the far-reaching impacts of NRIs, including fostering interdisciplinary collaboration, capacity building and innovation

Setting the scene: What is impact?

Research impact is the contribution that research makes to the economy, society, environment or culture, beyond the contribution to academic research.

Australian Research Council, CSIRO

But what is 'an impact'?

"Impact is the extent to which the intervention has generated or is expected to generate positive or negative, intended or unintended, higher-level effects."

"The term impact describes all the changes which are expected to happen due to the implementation and application of a given policy option/intervention [such as investment in a Research Infrastructure and its activities]. Such impacts may occur over different timescales, affect different actors and be relevant at different scales (local, regional, national and EU)."

What this means in simple terms is that the activities carried out at your Research Infrastructure will lead to effects relevant to its different users, a wider community of stakeholders, economy and society at large. Whether you plan for it or not, all activities will generate an impact; if not in the short term (say, in one or two years) then at a later stage.

How can we understand what impacts a Research Infrastructure generates or will generate?

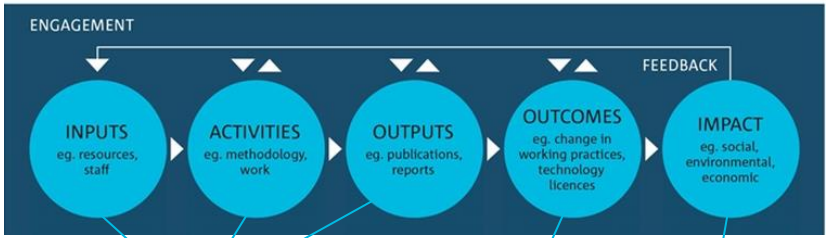
To help you navigate this complex topic, the RI-PATHS team suggests using an **'impact pathways'** approach. Its logic is simple but not simplistic.

The resources you invest or use allow for (or prompt) an activity to happen. This activity generates some direct results (so-called outputs) that can lead to certain short- or long-term effects (so-called outcomes). Finally, certain impacts emerge.

ri-paths-tool.eu

How do we define impact?

CSIRO's Impact Framework

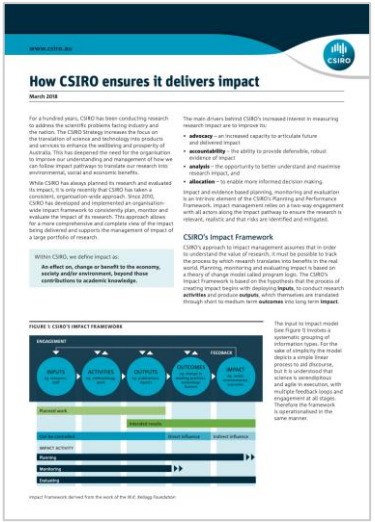


People in academia

People who make policy or commercial outcomes

People who are the end beneficiaries of research (i.e. public)

Source: CSIRO



How CSIRO ensures it delivers impact

March 2018

Australia's National Science Agency

Impact Evaluation Guide

February 2020

Discussion session 1: Measuring impact

Kerry Mora, Commmunications manager, Australian Access Federation (AAF)

Lightning talk: Exploring impact tracking through Trust & Identity, ORCID & PIDs and Federation reporting

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Discussion session 1: Measuring impact

Exploring impact tracking through Trust & Identity, ORCID & PIDs and Federation reporting - (Australian Access Federation)

ORCID and PIDs

Uniquely identify researchers and enable tracking of research outputs, and the impact their research, has on the economy, society and culture.

ORCID (Open Researcher and Contributor Identifier) is a type of persistent identifier (PID), that can enhance reporting and identify research collaborations and the value of national research infrastructure, universities and funders.

Trust & Identity

Making visible the impact of Australia's national microscopy infrastructure.

Microscopy Australia has partnered with the Australian Access Federation (AAF), to explore how richer reporting, impact tracking and usage data, can be provided through persistent identifiers (PIDs), to reveal the impact of their facilities.

Federation reporting

If you are a service on the Australian Federation we are currently developing new reporting dashboards to report on services.

The Federation can reveal, the volume of users and authentications, and what organisation they are coming from. We are currently seeking testers for our prototype. Come chat with me after.

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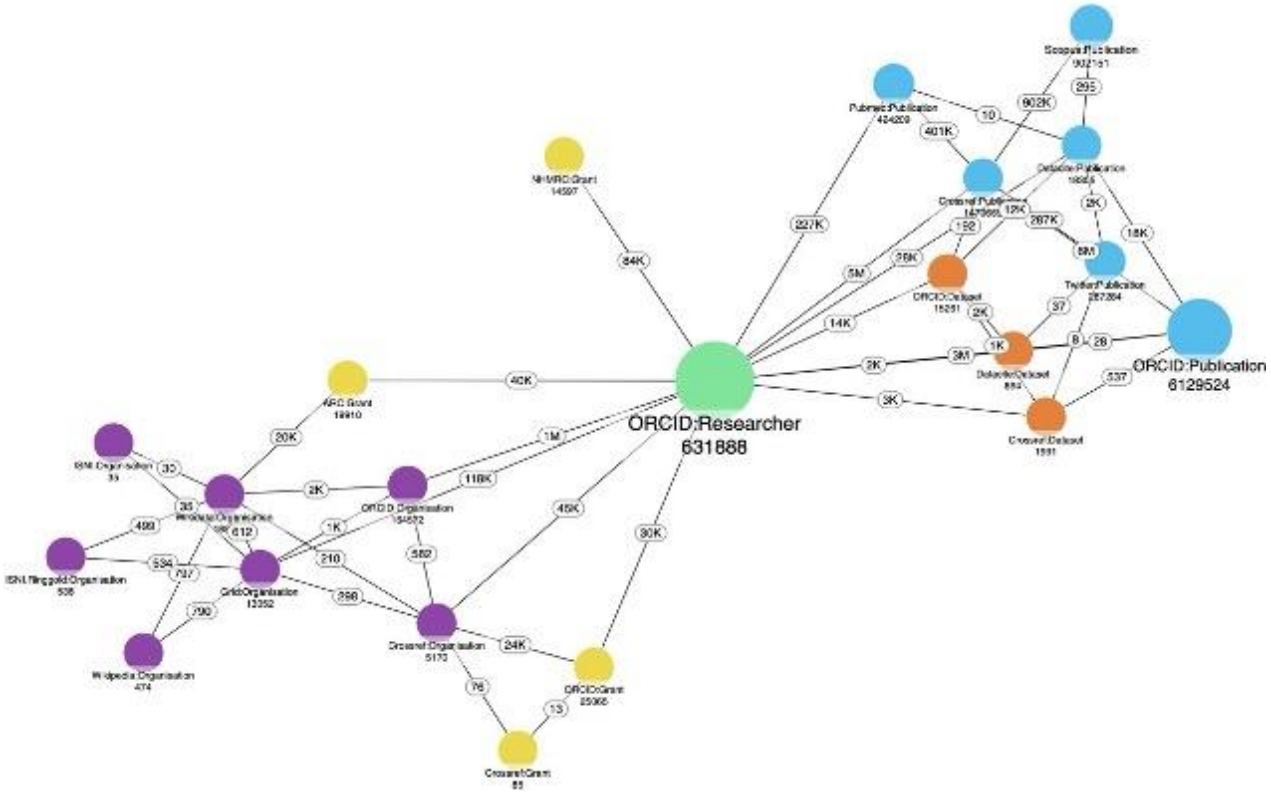
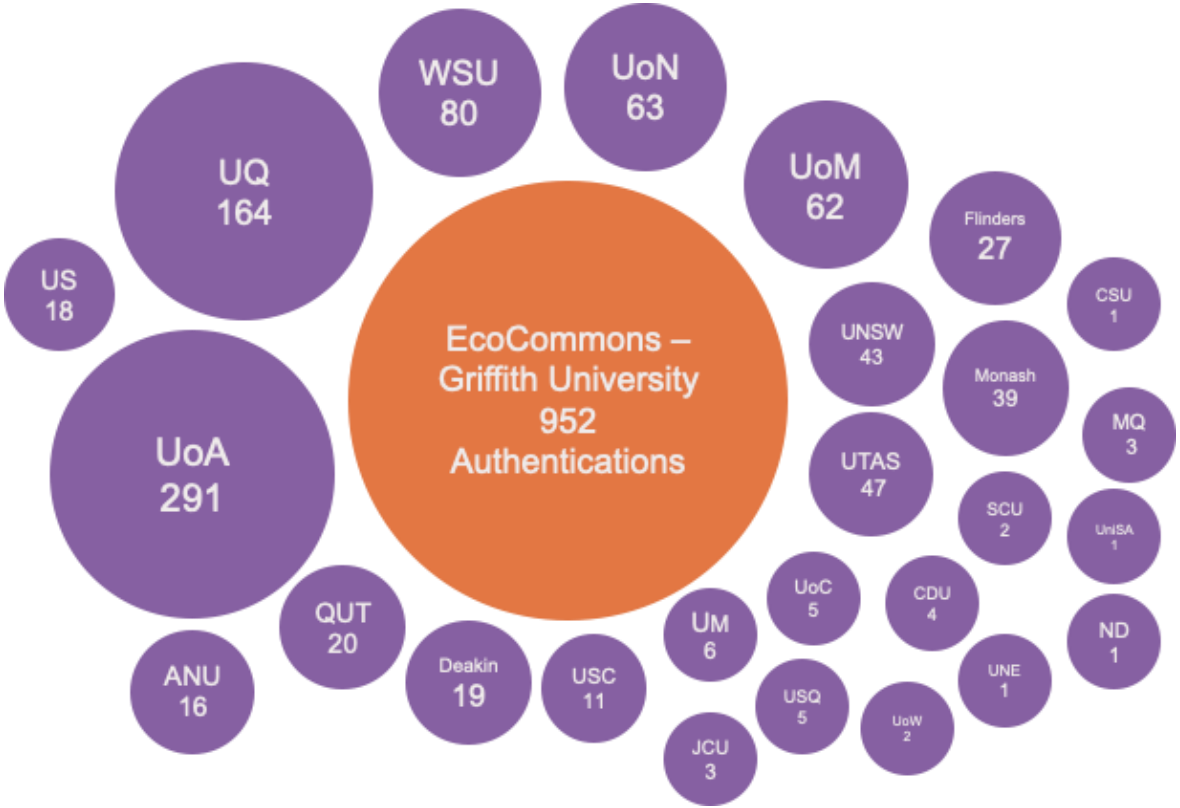
Australian PID Graph - 10M research objects



Enabling Research



Discussion session 1: Measuring impact

What are you measuring?

What are your challenges?

How can your needs be addressed?

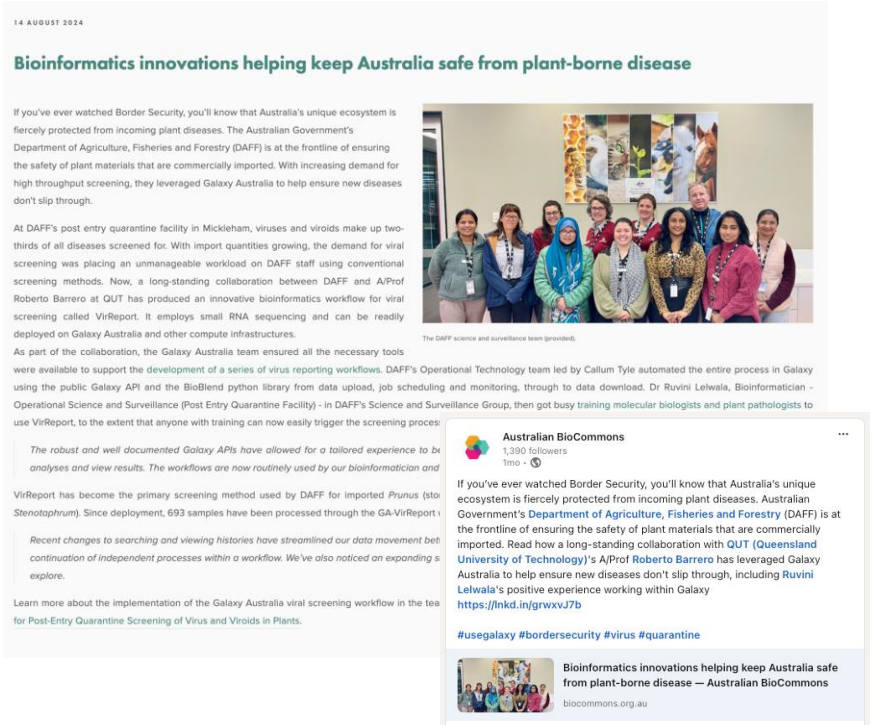
Add suggestions for recommended resources, best practice examples or peers who nail it!

Eg: Centre for Scientific Engagement and Community Engagement: https://www.cscce.org/resources/

Discussion session 2: Communicating impact

Dr Christina Hall
Associate Director - Training & Communications, Australian BioCommons

Discussion session 2: Communicating impact



14 AUGUST 2024

Bioinformatics innovations helping keep Australia safe from plant-borne disease

If you've ever watched Border Security, you'll know that Australia's unique ecosystem is fiercely protected from incoming plant diseases. The Australian Government's Department of Agriculture, Fisheries and Forestry (DAFF) is at the frontline of ensuring the safety of plant materials that are commercially imported. With increasing demand for high throughput screening, they leveraged Galaxy Australia to help ensure new diseases don't slip through.

The DAFF science and surveillance team (provided).

At DAFF's post entry quarantine facility in Mickleham, viruses and viroids make up two-thirds of all diseases screened for. With import quantities growing, the demand for viral screening was placing an unmanageable workload on DAFF staff using conventional screening methods. Now, a long-standing collaboration between DAFF and A/Prof Roberto Barrero at QUT has produced an innovative bioinformatics workflow for viral screening called VirReport. It employs small RNA sequencing and can be readily deployed on Galaxy Australia and other compute infrastructures.

As part of the collaboration, the Galaxy Australia team ensured all the necessary tools were available to support the development of a series of virus reporting workflows. DAFF's Operational Technology team led by Callum Tyle automated the entire process in Galaxy using the public Galaxy API and the BioBlend python library from data upload, job scheduling and monitoring, through to data download. Dr Ruvini Lelwala, Bioinformatician - Operational Science and Surveillance (Post Entry Quarantine Facility) - in DAFF's Science and Surveillance Group, then got busy training molecular biologists and plant pathologists to use VirReport, to the extent that anyone with training can now easily trigger the screening proces

> *The robust and well documented Galaxy APIs have allowed for a tailored experience to be analyses and view results. The workflows are now routinely used by our bioinformatician and*

VirReport has become the primary screening method used by DAFF for imported *Prunus* (sto *Stenotaphrum*). Since deployment, 693 samples have been processed through the GA-VirReport

> *Recent changes to searching and viewing histories have streamlined our data movement bet continuation of independent processes within a workflow. We've also noticed an expanding s explore.*

Learn more about the implementation of the Galaxy Australia viral screening workflow in the tea for Post-Entry Quarantine Screening of Virus and Viroids in Plants.

Australian BioCommons
1,390 followers
1mo ·

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https://lnkd.in/grwxvJ7b

#usegalaxy #bordersecurity #virus #quarantine

Bioinformatics innovations helping keep Australia safe from plant-borne disease — Australian BioCommons
biocommons.org.au

biocommons.org.au/news stories:

1. Better plant quarantine enabled by Galaxy Australia's two millionth job (Mar 2021)

1. Ready-made training environments for uplifting computational science skills in plant biosecurity (Jun 2022)

1. Bioinformatics innovations helping keep Australia safe from plant-borne disease (Aug 2024)

Discussion session 2: Communicating impact

What / why did we choose to communicate this?	What were the challenges?	What do I wish for in the future?
Real world application	Identifying impact stories	More pitches for stories
Strategically important	Small part of the process	Better recognition of RI
Partners	Sharing wins	Shared storytelling
Easy to amplify message	Distribution	Partner connections
Demonstrates opportunity for other partnerships	Images	Willingness to tell iterative stories about progress

Discussion session 2: Communicating impact

What are you measuring?

What are your challenges?

How can your needs be addressed?

Add suggestions for recommended resources, best practice examples or peers who nail it!

Eg: Centre for Scientific Engagement and Community Engagement: https://www.cscce.org/resources/

Discussion session 3: Evaluating impact

Invited Lightning talks:

Jo Croucher (NCI)

Liv Shanahan (ARDC)

NCI Impact

National research and collaboration

Over **7,000** active users
25+ collaborating research organisations

8 Industry Partnerships

Support for **$650M** of ARC and NHMRC research

NCI **Expertise**
Optimisation of high-performance compute codes to increase productivity

World-class compute and data services infrastructure

1 Billion hours of compute per year

Heterogenous GPU and CPU architecture

Over **150 PB** of storage

Tier-1 Supercomputing Facility

~24 PT
Managed data collections

1,500+
Registrations for managed data collection

1,100+
Published datasets in the NCI Data Catalogue

NCI Metrics

Registrations

Allocatio

DOIs

Usage

Requirement for impact measures that are reliable, consistent, timely…

Studying Impact

- Capturing a range of measures linked to the strategic goals
- Some measures are challenging to capture (e.g. granular HPC usage)
- Need to invest in reporting infrastructure, tools & persistent IDs
- Tracking impact well requires upfront planning

Exploring the Uptake of Digital Research Infrastructure BoF

Thursday 2:40 - 3:40pm, Lake room 1-2

Why

Research infrastructure uptake, in particular how to define, measure and evaluate the uptake, is of interest to many stakeholders (including researchers, funders, policy advocates) across the digital research system.

Guest speakers

- Elina Griniece, Principal Researcher, European Future Innovation System (EFIS) Centre
- Kylie Morrow, Digital Content Creator, Atlas of Living Australia

Group aims

- How should we define “uptake” and “Digital Research Infrastructure (DRI)”?
- How can uptake be evaluated / assessed in a meaningful way?
- What are the different stakeholders’ needs when it comes to documenting / reporting on uptake?
- How can we balance these needs?

Discussion session 3: Evaluating impact

What are you measuring?

What are your challenges?

How can your needs be addressed?

(Suggest resources)

Add suggestions for recommended resources,
best practice examples or peers who nail it!

https://ri-paths-tool.eu/files/RI-PATHS_Guidebook.pdf

Summary and Wrap up - Kelsey Druken

Measuring Impact

Communicating Impact

Evaluating Impact