Loop – FAIR 3D geological modelling

Laurent Ailleres (Monash University)

117th OGC Member Meeting

Virtual – GeoScienceDWG | 8th December 2020

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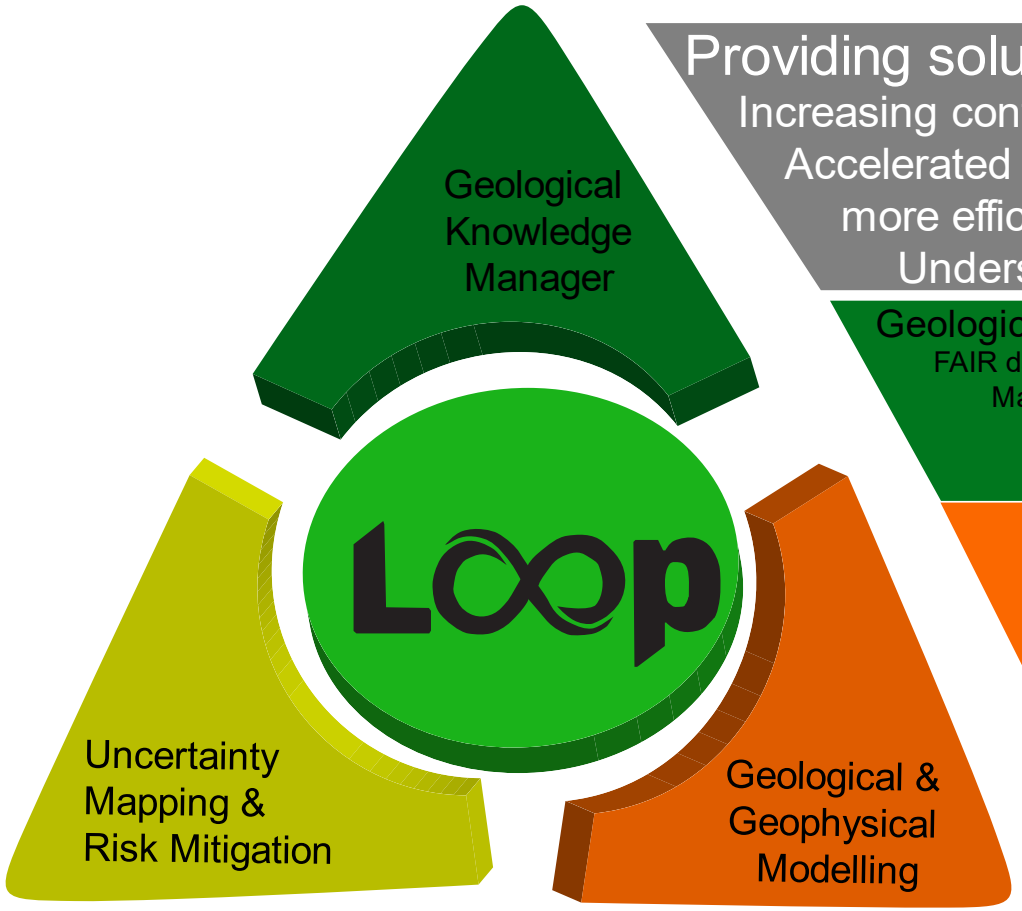
Loop

An integrated and interoperable platform enabling 3D stochastic geological modelling



Providing solutions for subsurface resources management:

Increasing confidence in subsurface resources & materials management

Accelerated decision making and testing (the ability to make quicker, more efficient decisions and to test them early)

Understanding and reducing risk in resources management

Geological Knowledge Manager

FAIR data / FAIR software

Map2loop: automated knowledge/data extraction from digital maps

Use more knowledge / use knowledge more

Encoding geological rules

3D Geological and Geophysical Modelling

Encoding structural geological rules

Developing new geologically and petrophysically constrained inversion methods

Developing joint geology/geophysics inversions

Uncertainty Mapping & Risk Mitigation

Geological simulations

Bayesian modelling

Value of information

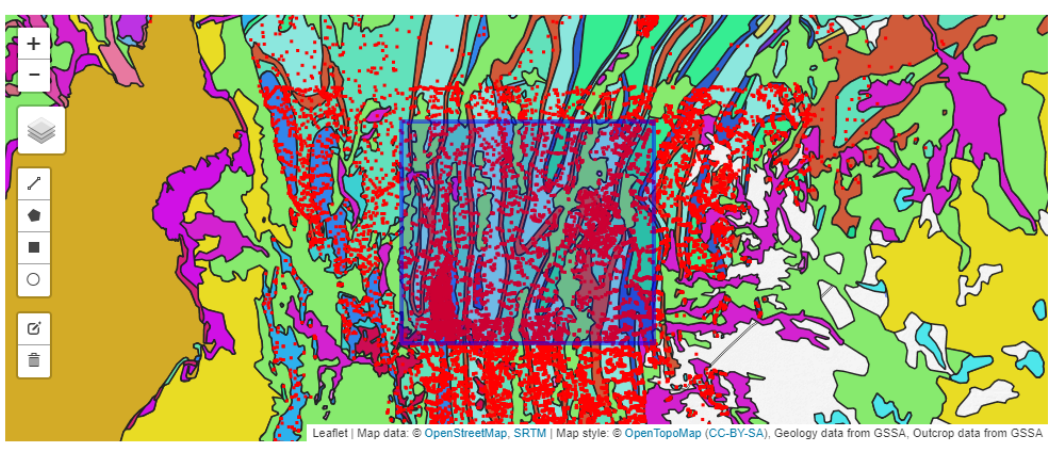
Decision making enabler

Lead-CI
Dr Laurent Ailleres
Monash University

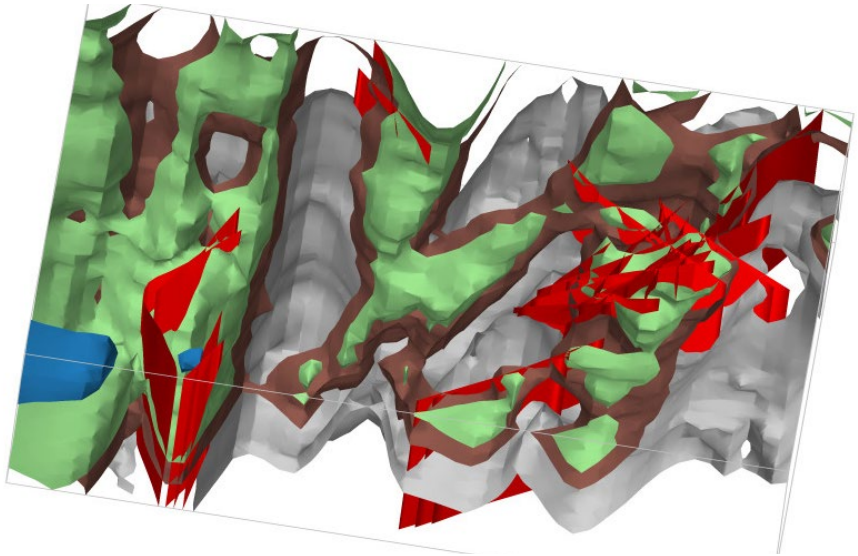
MONASH University · RING Université de Lorraine · Australian Government Australian Research Council · Australian Government Geoscience Australia · Government of South Australia Department of State Development · SOUTH AUSTRALIA · British Geological Survey Natural Environment Research Council · MinEx CRC · AngloAmerican · 100 Years · The University of Western Australia Centre for Exploration Targeting · RWTH Aachen University · AuScope · Government of Western Australia Department of Mines and Petroleum · Northern Territory Government · NSW Government Regional NSW · brgm · Canada Geological Survey Commission Géologique · MICROMINE · BHP

ONE Geology — Providing geoscience data globally

Demo


Leaflet | Map data: © OpenStreetMap, SRTM | Map style: © OpenTopoMap (CC-BY-SA), Geology data from GSSA, Outcrop data from GSSA

GSSA



Research Organisations

MONASH University

THE UNIVERSITY OF WESTERN AUSTRALIA

RING

RWTH AACHEN UNIVERSITY

UNIVERSITÉ TOULOUSE III PAUL SABATIER

British Geological Survey
Expert | Impartial | Innovative

CANADA 1842 GEOLOGICAL SURVEY - COMMISSION GÉOLOGIQUE

Australian Government
Geoscience Australia

Geoscience for a sustainable Earth
brgm

AuScope

Funding Organisations (cash & in-kind)

Australian Government
Australian Research Council
ARC LP170100985

MinEx CRC

Geological Survey of Western Australia

BHP

Australian Government
Geoscience Australia

Geological Survey of Western Australia

AngloAmerican

MICROMINE

NORTHERN TERRITORY GOVERNMENT

NSW GOVERNMENT Regional NSW

Government of South Australia
Department of State Development

SOUTH AUSTRALIA

Partner Organisations

Loop

WP #2/3 – Map2loop-current activities

a) Refactoring of map2loop code: (Yohan de Rose, Monash)

a) Ease of installation

b) Conform code to Loop standards

b) Testing of map2loop code

a) Mark Jessell Proof of concepts

b) Nishka Piechocka (MRIWA 577 Hamersley project)

c) Fabiele Dalmaso Spode

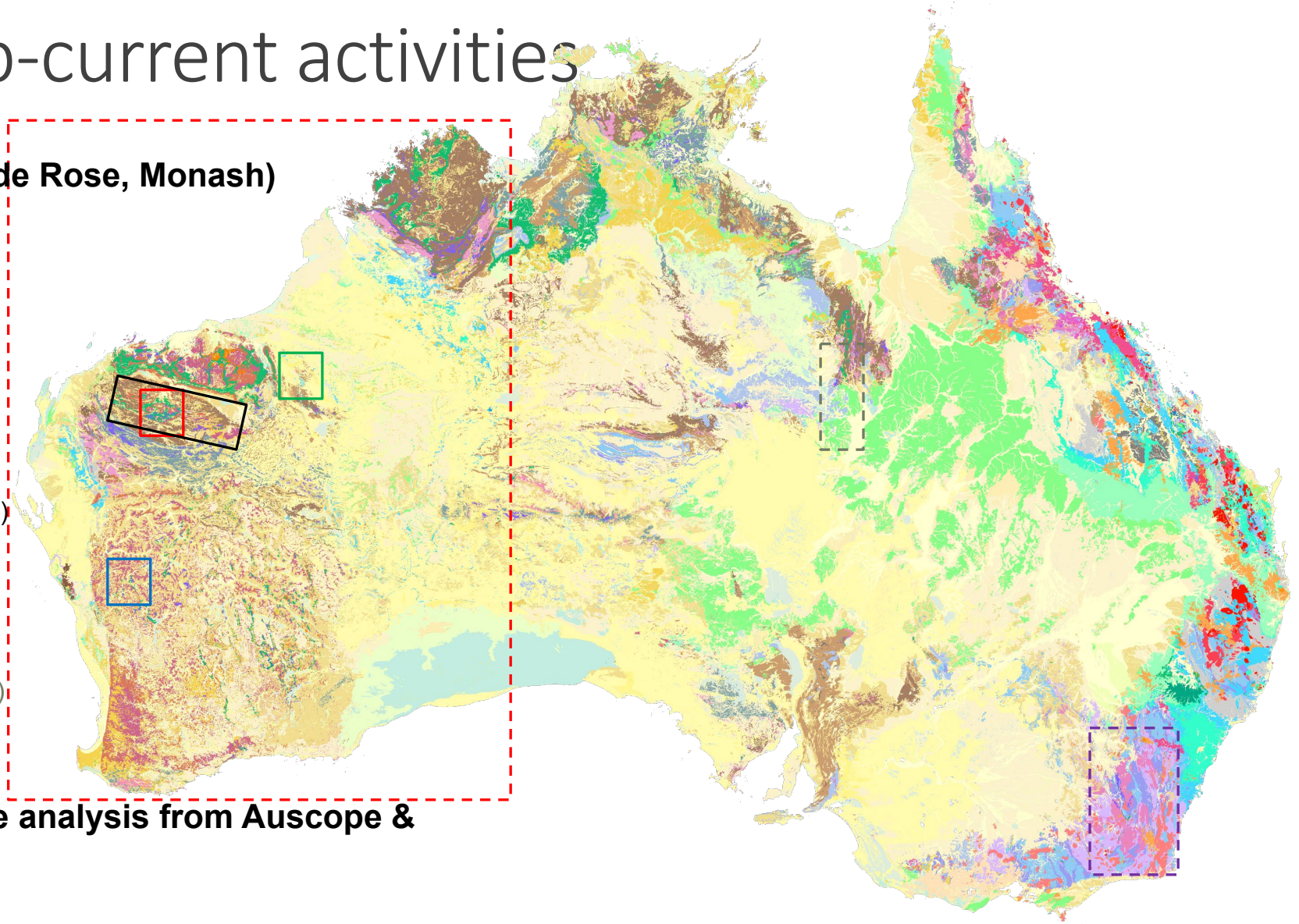
d) (MRIWA 521/554 Paterson/Basins projects)

e) Ranee Joshi Yalgoo Singleton GSB

f) Mt Isa Inlier Rock Valenta/Karen Connors (UQ,AA)

g) NSW Lachlan Orogen examples

c) Seeking additional funding for drillhole analysis from Auscope & MinEx CRC Opportunity funds



Governance

One Steering Committee:

- Chair:
  Carina Kemp (Aarnet)
- Members:
  - Laurent Ailleres (Monash / lead-CI)
  - Mark Jessell (UWA / rep. MinEx CRC)
  - Tim Rawling (AuScope)
  - Steve Hill (Geoscience Australia)
  - Klaus Gessner (GSWA / representing the state and territory surveys)
  - Matthew Harrison (BRGM / rep. OneGeology)

Research and Development team:

- Lead-CI:
  Laurent Ailleres (Monash)
- Senior software architect:
  Roy Thomson (Monash)
- Knowledge Manager:
  Boyan Brodaric (Geological Survey of Canada)
- Map2Loop / Pre-processing:
  Mark Jessell (UWA)
- LoopStructural:
  Lachlan Grose (Monash)
- Geophysical Integration:
  Jeremie Giraud (UWA)
- Uncertainty and value of information:
  Guillaume Pirot and Mark Lindsay (UWA)
- Knowledge transfer and community:
  Robin Armit (Monash)