Australian Large Area Woody Vegetation Assessment

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CRCSI 2.07 Project

Department of Environment, Land, Water & Planning

State Government Victoria

RMIT University

Outline

- Background
- Goal
- Working framework
- Overview and highlights
- Lessons learned
- Future work

Australia has **125 million hectares of forest**.

-81.7 M hectares is native forest, dominated by eucalypt (75%) and acacia (8%) forest types

- 2.02 M hectares is plantations.

http://adl.brs.gov.au/forestsaustralia/facts/type.html

Goal

To develop **processes** to characterise woody vegetation ecosystems through **automated feature generation**, using a combination of ground (field), airborne and space-borne image and ranging data.

Working framework

RMIT University

Queensland Government

Landgate

NSW Government | Industry & Investment

Department of Environment, Land, Water & Planning

State Government Victoria

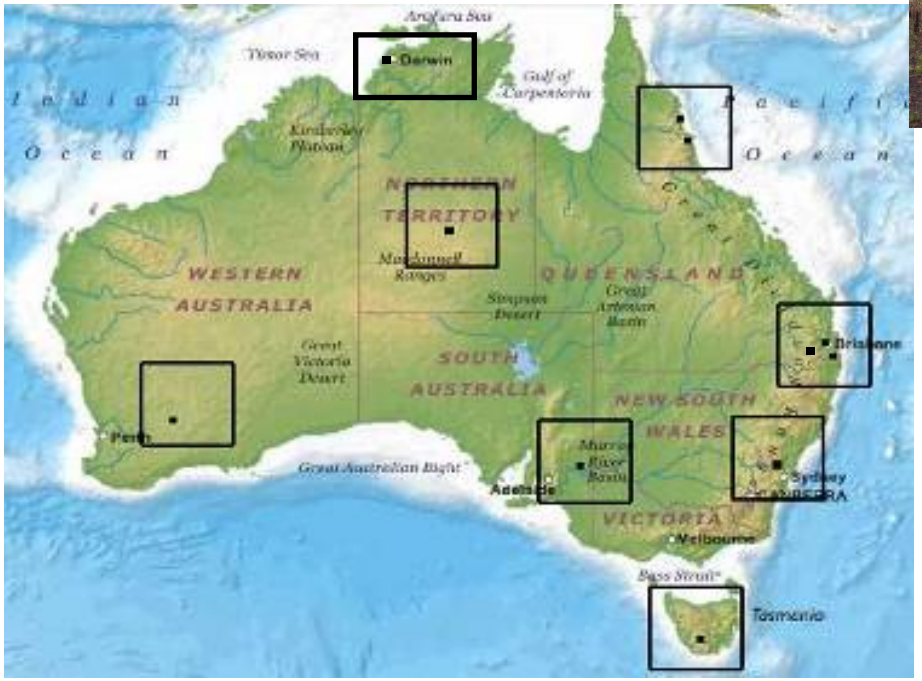
TERN
Terrestrial Ecosystem Research Network

AusCover
Remote Sensing Data Facility

crc•si

Credo, WA

Chowilla, SA

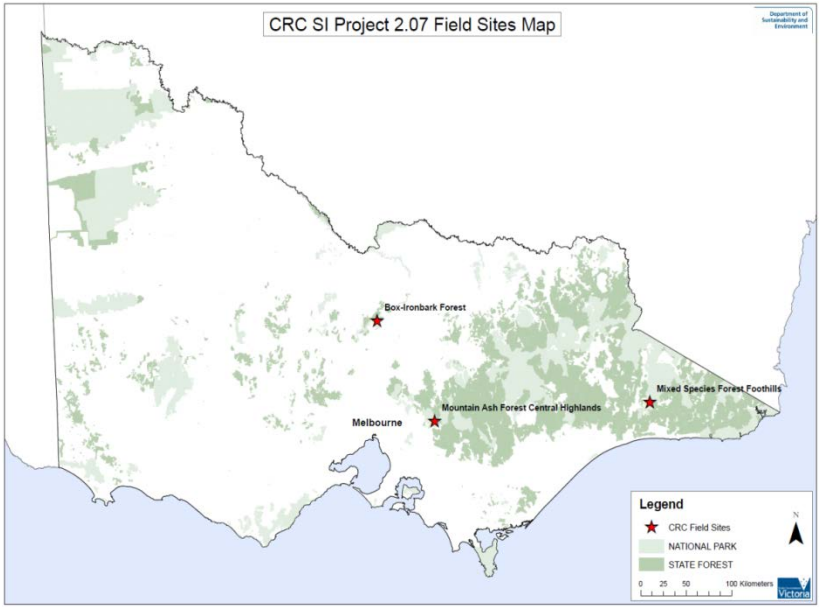


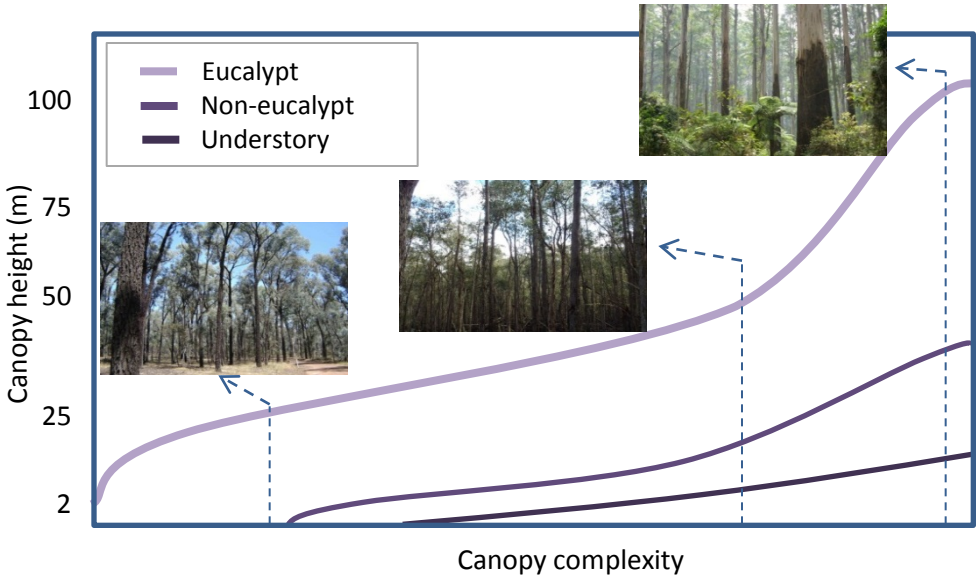
Litchfield, NT

Robson Creek, QLD

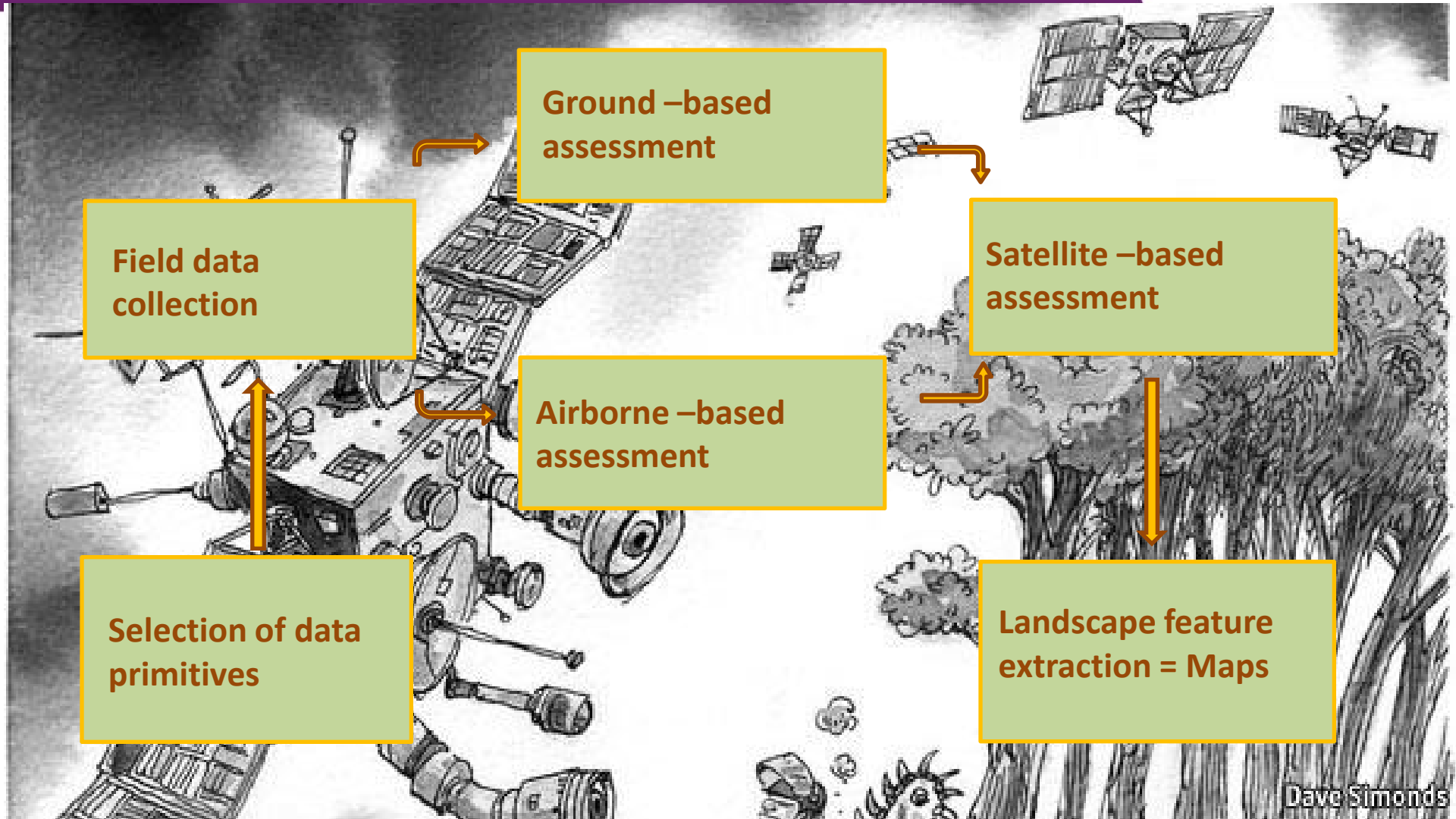
Tumbarumba, NSW

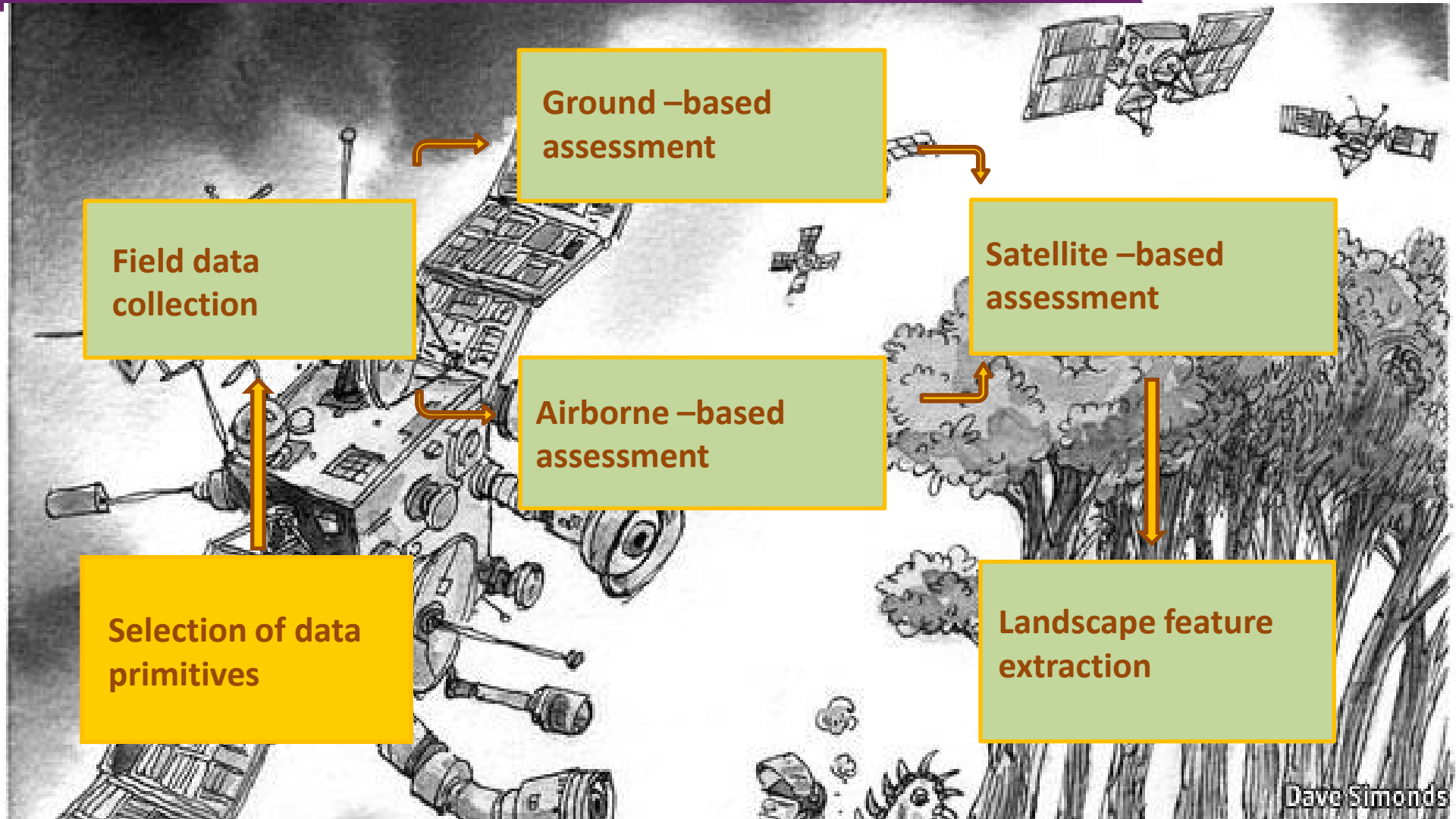
Working framework





(Wilkes et al., IGARSS 2013)


Ground –based assessment
Satellite –based assessment
Field data collection
Airborne –based assessment
Selection of data primitives
Landscape feature extraction = Maps
Dave Simonds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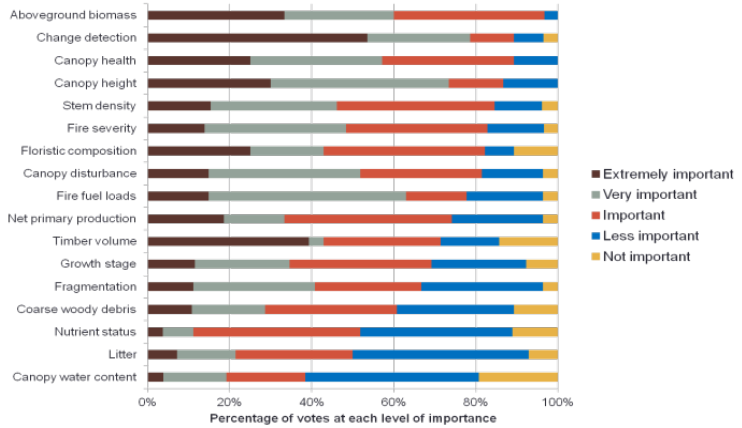
Selection of data primitives

AU & NZ context

International directives

Santiago declaration
Montreal process WG

Essential climate variables
GCOS ECVs



Australian Government
Department of Agriculture, Fisheries and Forestry

Australian Government
Australian Bureau of Agricultural and Resource Economics and Sciences

Landgate

Department of Environment, Land, Water & Planning

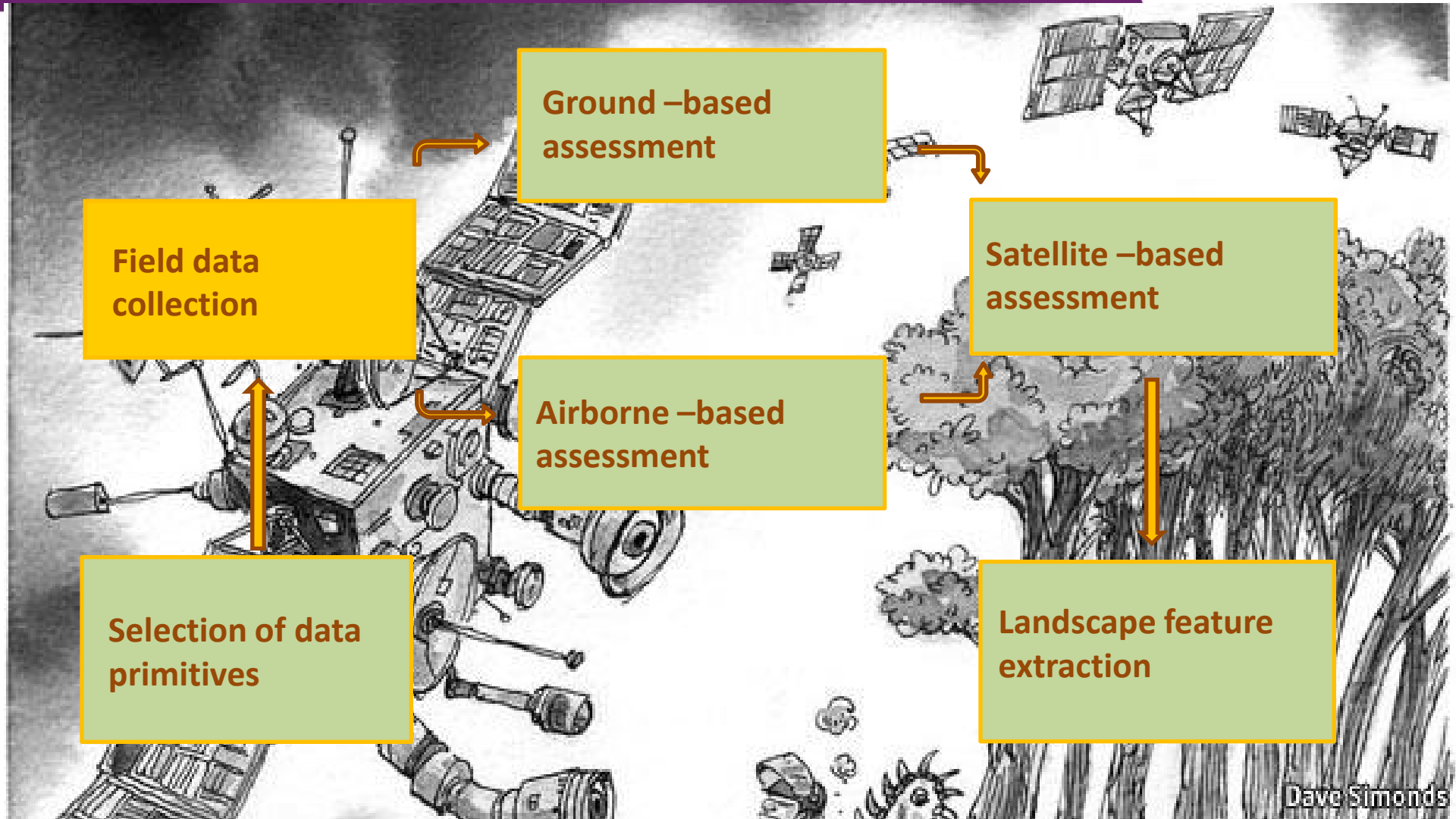
State Government Victoria

NSW Government Industry & Investment

Queensland Government

Selection of data primitives

High priority	Low priority
Canopy height	*Plant Area Volume density*
Fractional cover	*Coarse woody debris*
Woody/non-woody classification	*Tree diameter/spacing/stem density*
Forest typing	*Foliage density/discolouration*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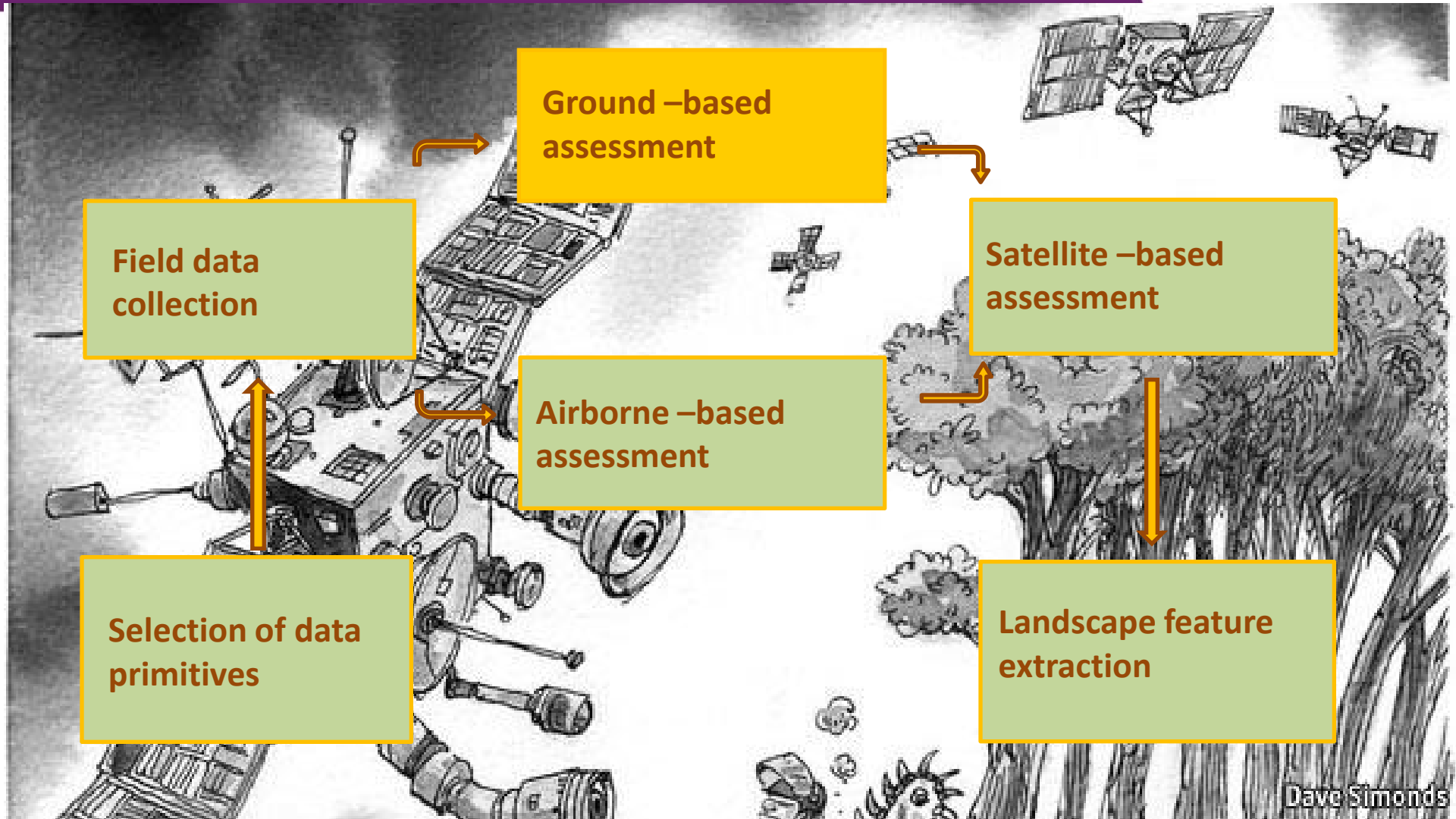
Field data collection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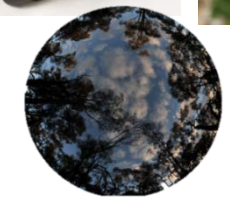
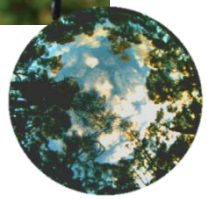
Ground-based assessment



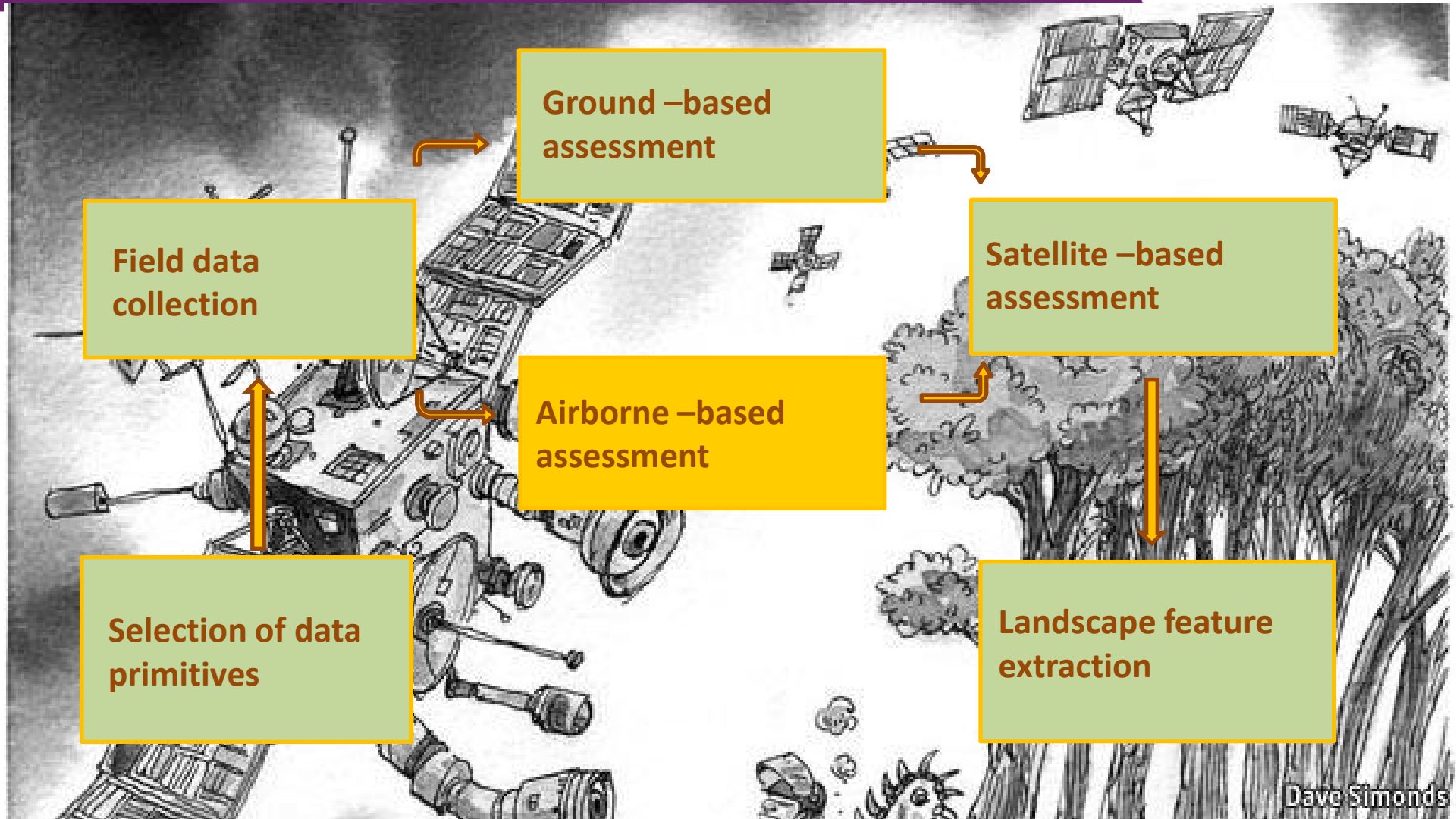


AusCover

AusCover Good Practice Guidelines (A technical handbook supporting calibration and validation activities of remotely sensed data products)

2015, Version 1.1

TERN Delivery v1.0 November 2012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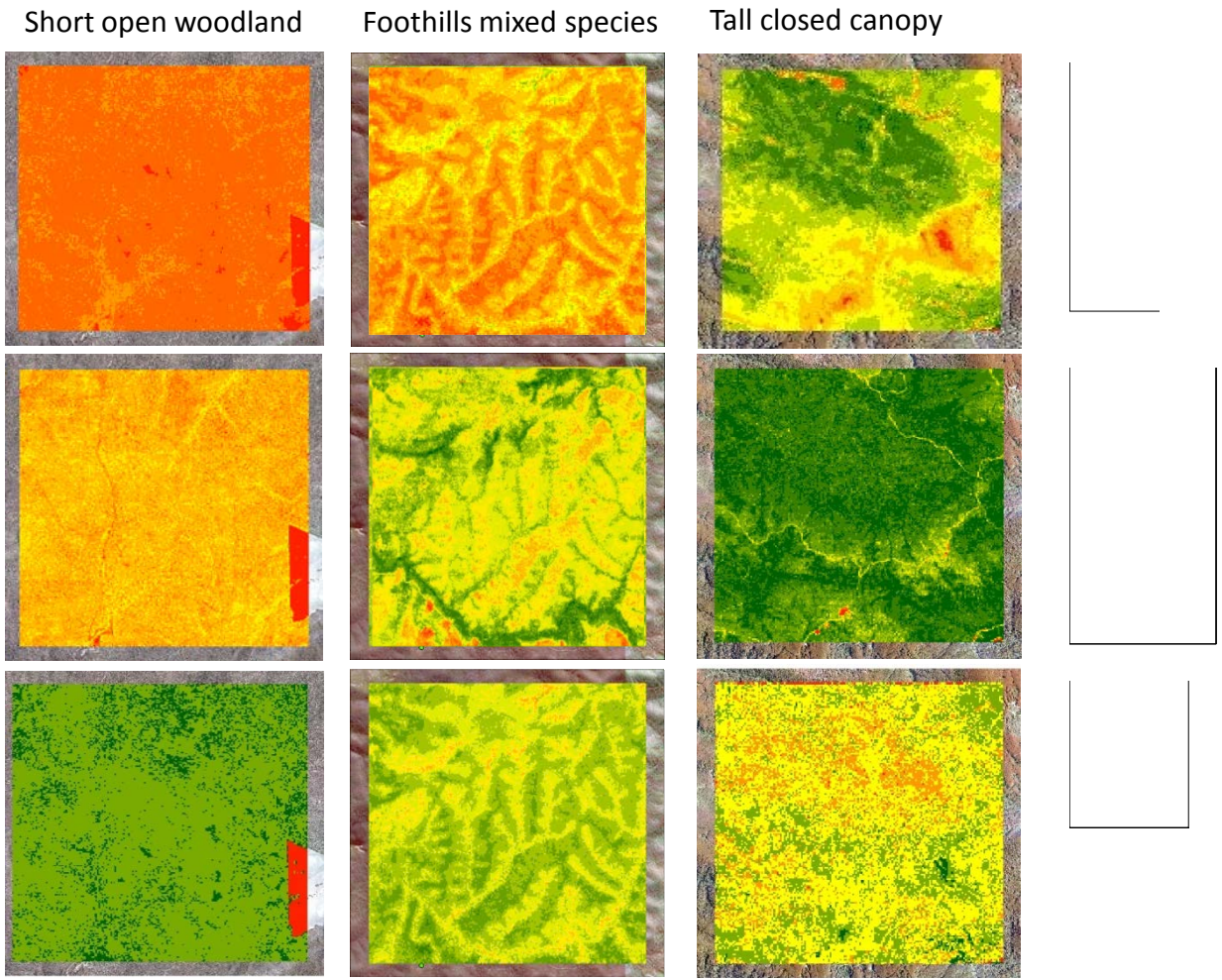
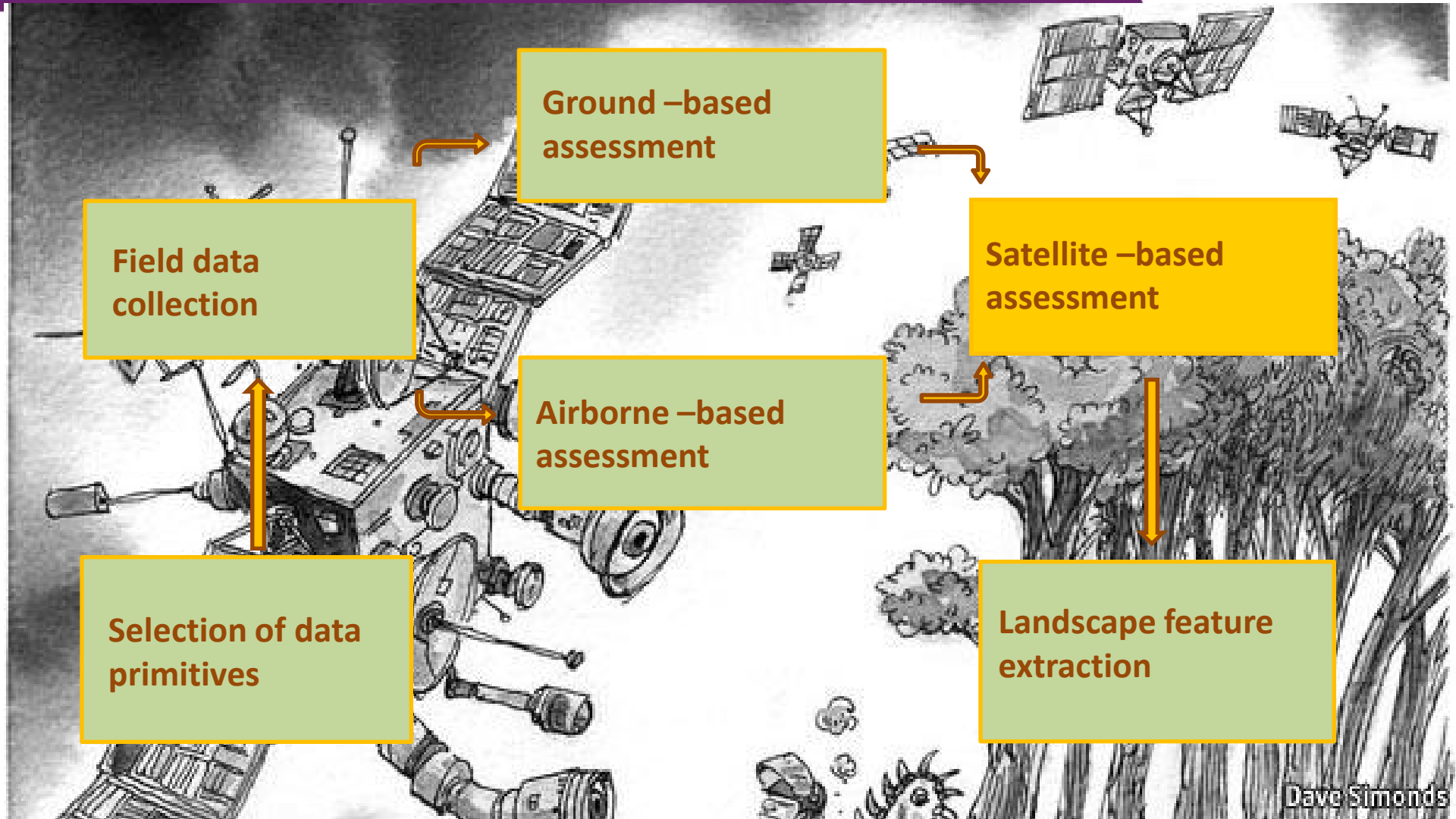
Airborne-based assessment

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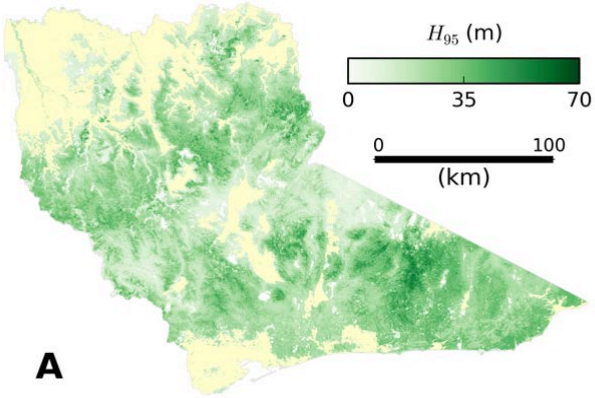
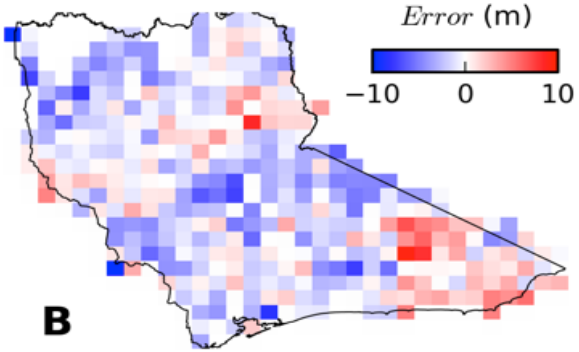
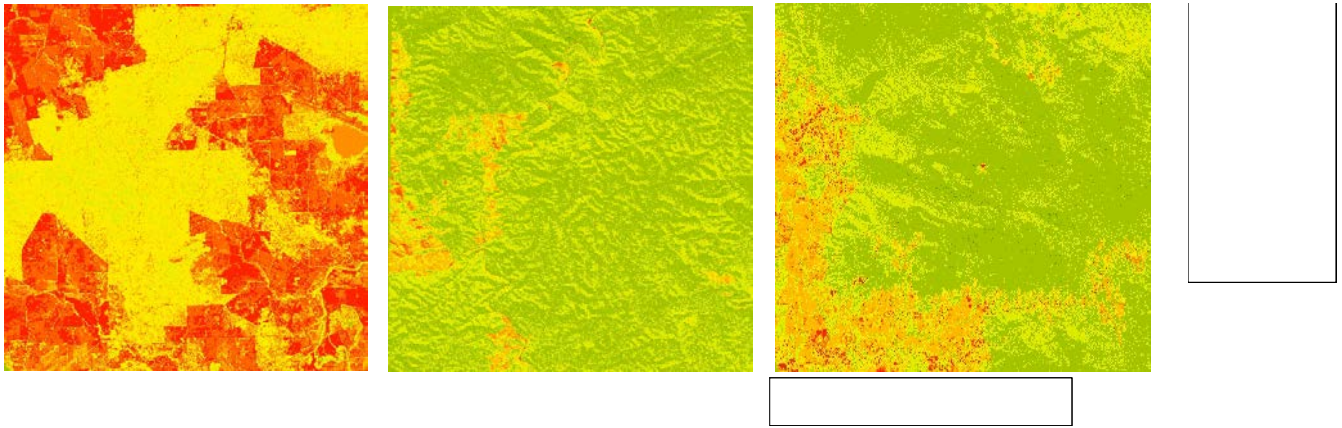
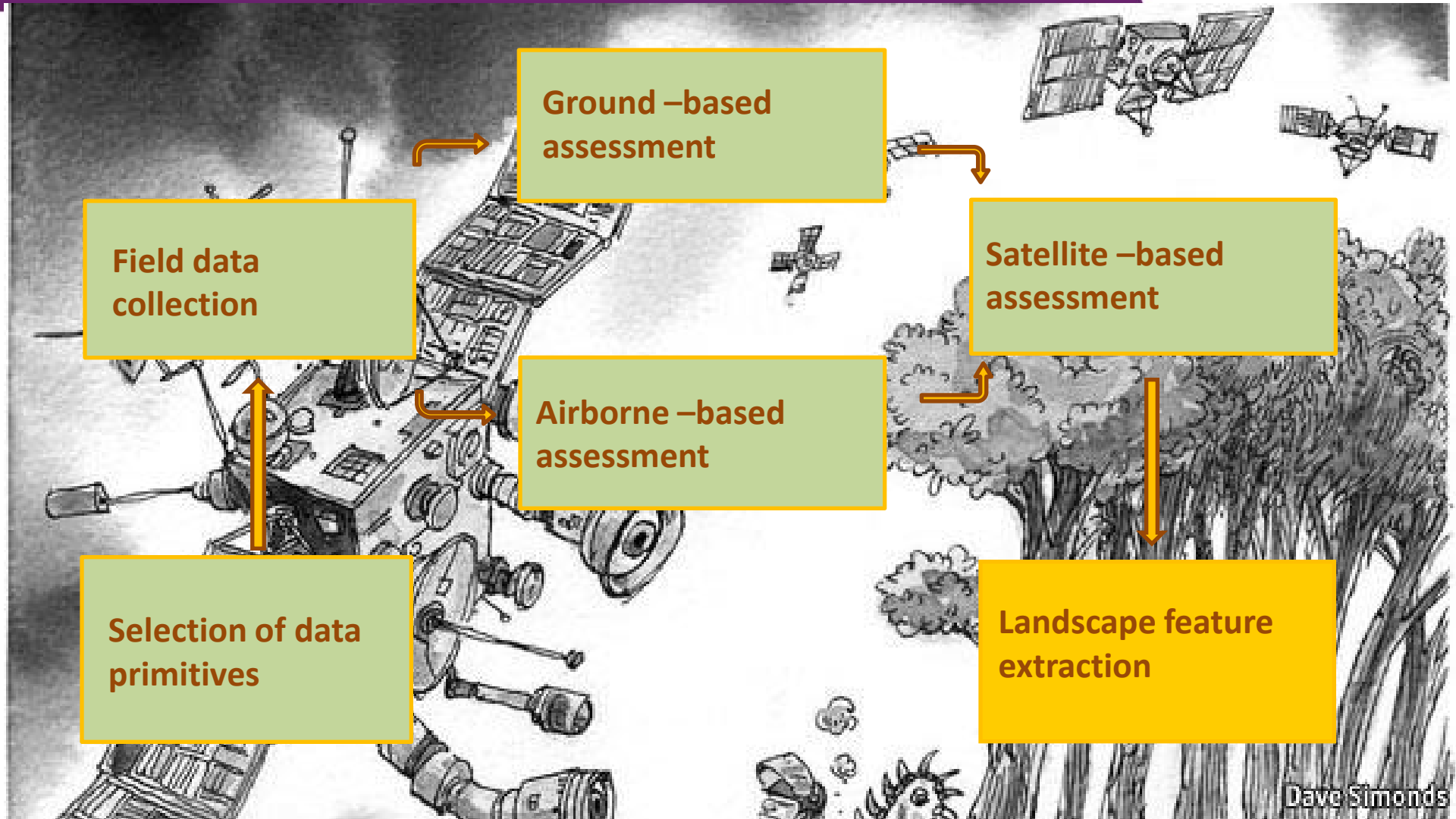
Satellite-based assessment





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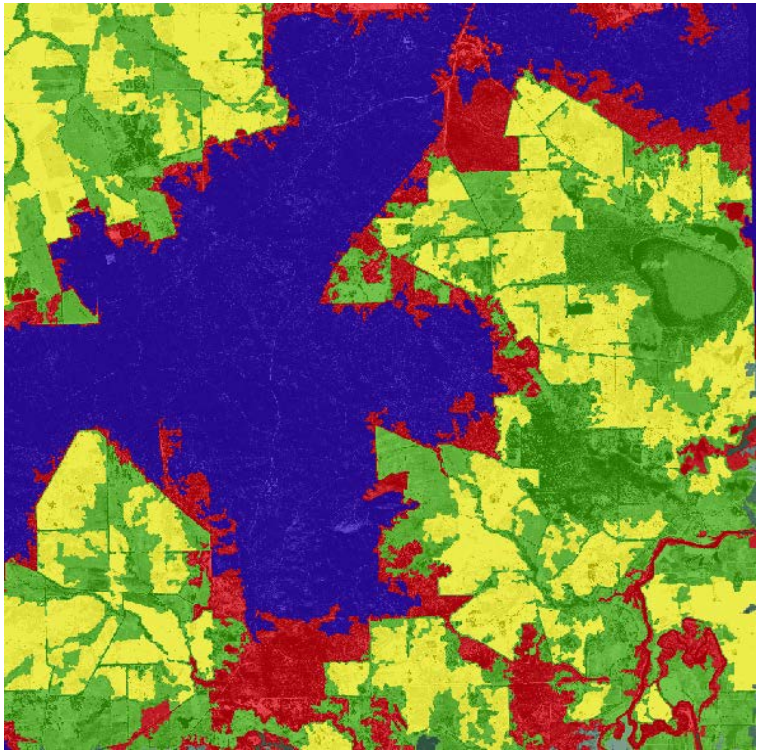
Landscape feature extraction

- Automatic Classification method: with open number of end-classes. (e.g. short, medium, tall height; open, closed forest; Euc/Non-Euc)

- Postclassification: Areas under 1000 pixels have been removed



Lessons learned

- Collaborative frameworks lead to high-quality outputs
- Projects dealing with multi-jurisdictional partners have specific needs:
  - Flexibility
  - Documented and open source tools
  - Good communication

Student placements:	Periodical meetings:	Workshops:	Roadshow:
Phil Wilkes, DELWP (VIC) Will Woodgate, DSITIA (QLD)	Quarterly report meetings Local visits	Canberra, 21st Feb 2013 Melbourne, 26th Aug 2014	Brisbane, 11th June 2014 Parramatta, 17th June 2014 Melbourne, 30th June 2014

Future work

- Compare the performance of various ensemble regression methods for canopy attribution using LiDAR as training data

- Combine different data primitives into composite metrics (e.g. canopy condition, biomass)

- Study the evolution of data primitives and composite metrics in threaten areas

Thanks!!!

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