Australian Radar Archive in the Cloud
Applications to Research and Industry
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### Why Open Data?
- Identified as a 'nationally significant' data collection as part of the Australian Research Data Services (RDS) project
- BoM radar network - one of the largest remote sensing assets in Australia
- Without data access there can be no science - **Securing Australia's Role in the International**
- Remove the $, delay and data issues with current cost-recovery service

### Environment

#### Hosting
- Industry (Roames)
- RDS

#### Access
- Met Office
- Australian Government Bureau of Meteorology
- Monash University - Selex Radar Workshops

#### Community
- Py-ART
- TERN
- NCI
- Ands

Integration with open source, radar user communities, and industry engagement. [aws.amazon.com/nearth](http://aws.amazon.com/nearth/)

Leveraging from existing scientific infrastructure, portals and communities to deliver the Australia Radar Archive

### Implementation
- Access through portals and APIs (THREADS/OpenDAP)
- Quality Controlled, ISO/IEC 11179 Standard for Metadata
- Uniform, predictable archive structure and names

- 768 yrs of data (27 TB)
- Some sites > 20 year record
- Issues with diversity, outages and moving radars

- Open data format (odimh5)
  - Support in many programming languages
  - Radar toolkits (wradlib, baltrad, py-art)
  - Self describing data format (HDF5)
  - Developed by EUMETNET (31 European Countries)
  - Replacing BoM rapic format

### Applications

#### National Convective Storm Climatology
- Ground truth for long-term environmental climatologies (e.g., calibrating parameters)
- Finescale hazard modelling (Applications for insurance)
- Energy Distribution
  - Clearance vs Risk
  - Maintenance cycle
  - Assessment of new corridors
- Develop an understanding thunderstorm drivers
  - local (e.g., terrain, sea breeze)
  - synoptic (e.g., fronts, wind regimes)
  - climate scale (ENSO forcing)

### Hail and Wind Nowcasting for Industry
- The presence of large hail can provide a proxy for damaging winds -> gridded swaths radar-derived estimates of hail can provide a powerful tool to assessing likely impact
- Doppler winds is often difficult to interpret. Single Doppler derived winds (Xu et al 2006) provides a technique for estimating potential near surface wind gusts that can be readily integrated into asset management.

| Hail Distribution
| Wind Distribution |

### Future
- Delivery of realtime volumetric data from the Australian Radar Network and radar-derived hazard product.
- Transition to CIPradial 2.0 improve data accessibility and interchangability with international communities
- South East Queensland Hazard Analysis and Verification Testbed (SEQ-HAVT) to refine hazard nowcasting and climatology products
- Integration of hazard products with industry asset geospatial datasets to automate mitigation and risk assessment during severe thunderstorm events
- Open access for Australian field campaign datasets, including the UQ-XPOL mobile radar

Made using Py-ART (Collis, S et al) and NASA Single Dop (T. Lang)