

# Towards Realistic Updraft Retrievals from Radar Data

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2010 ASR-STM Vertical Velocity Focus Group

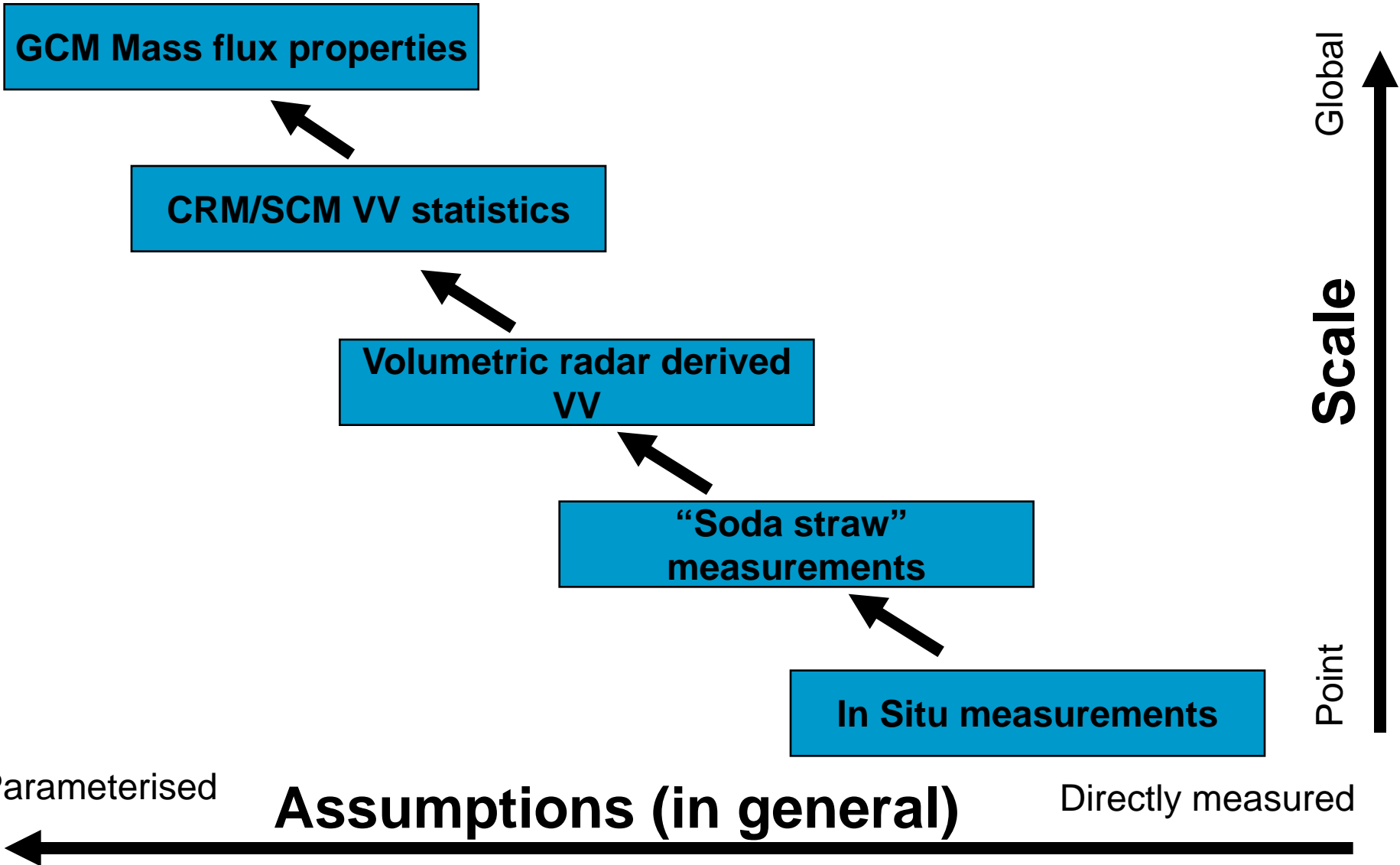


**Australian Government**  
Bureau of Meteorology

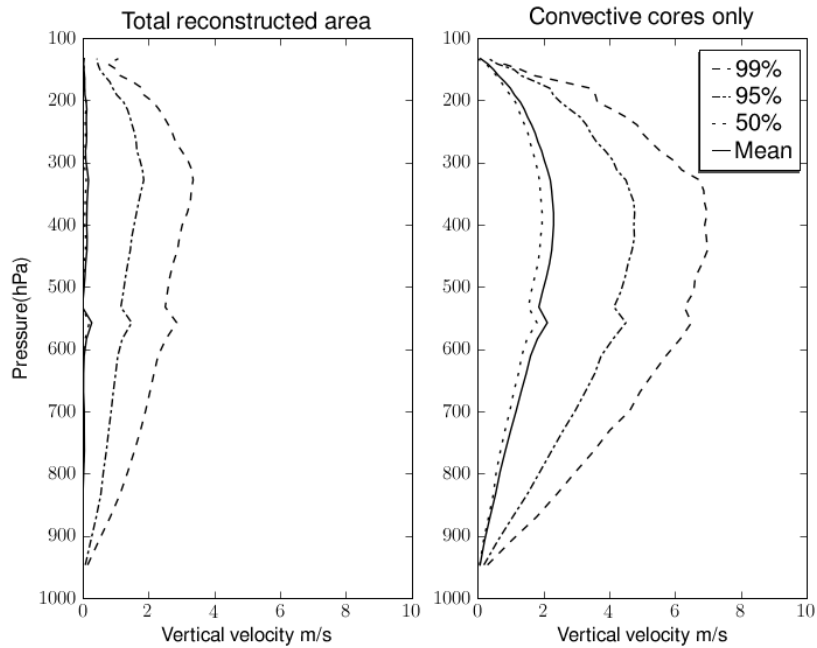
The Centre for Australian Weather and Climate Research  
A partnership between CSIRO and the Bureau of Meteorology



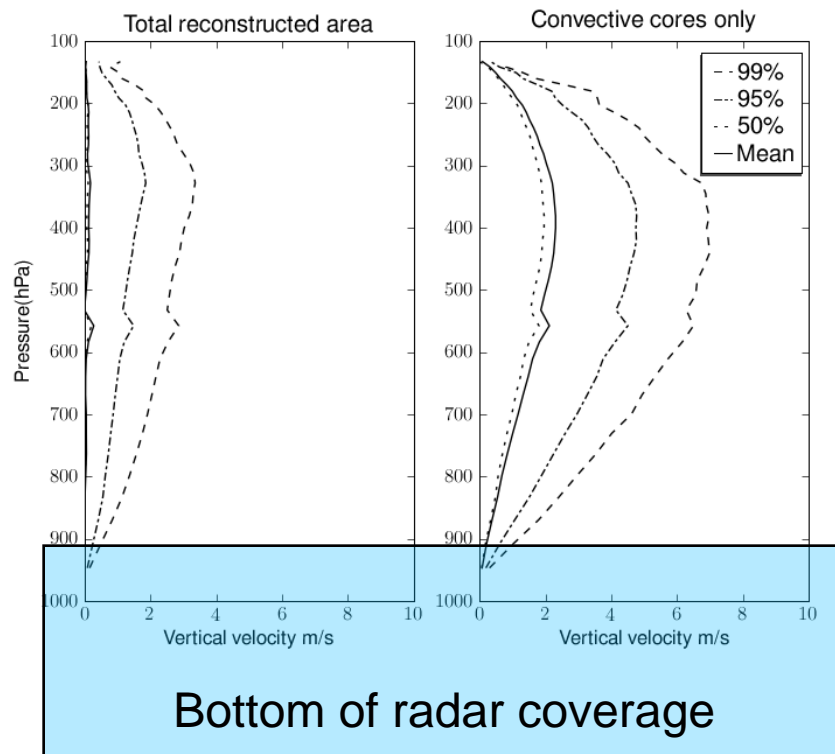
# Why bother?



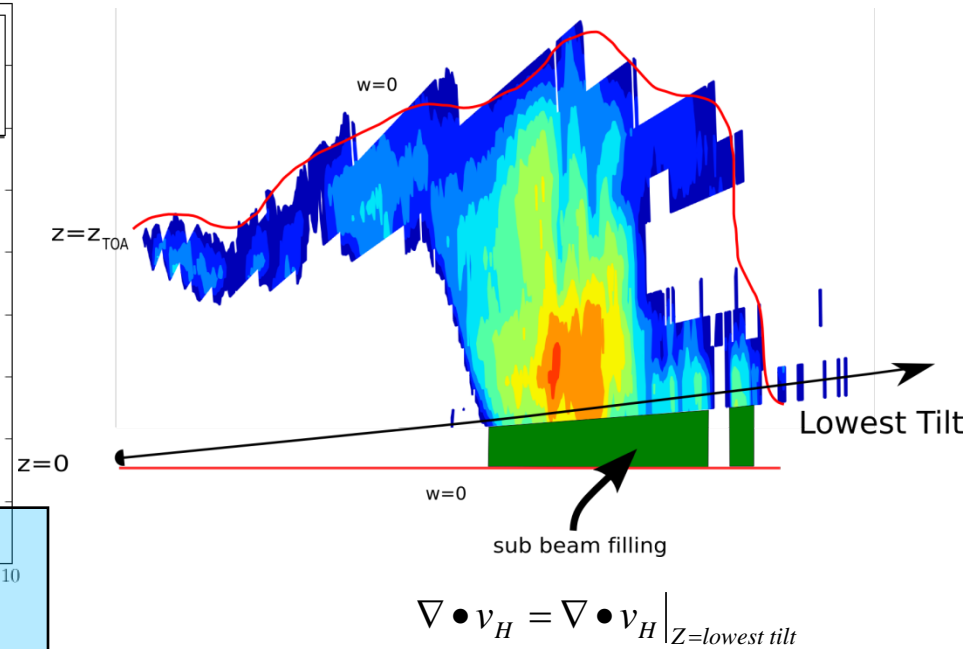
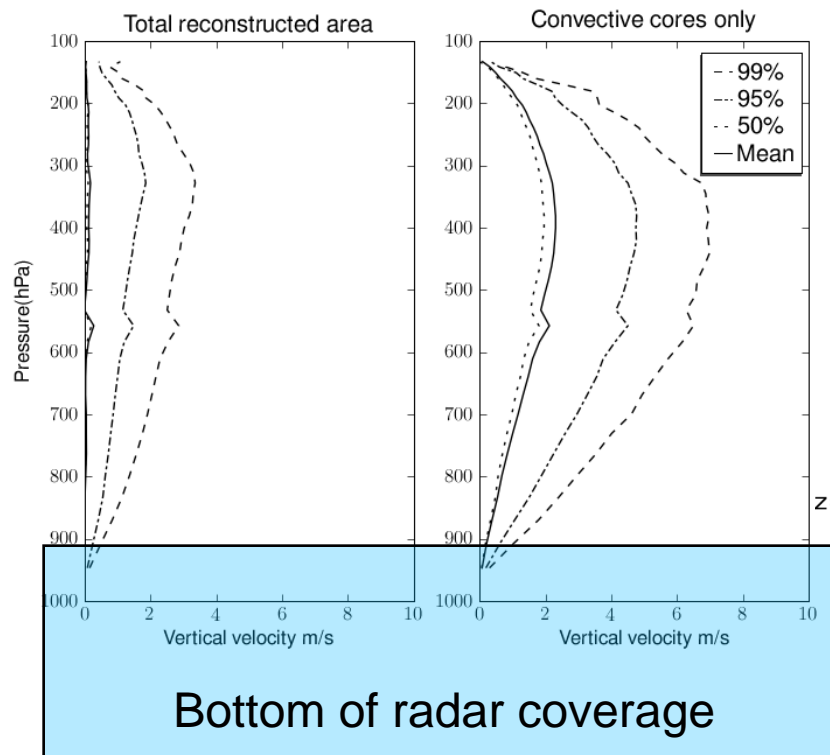
# The old way.... 2009



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# Sub coverage convergence



# Multi-Phase retrievals



- Old system set horizontal velocity to zero where masked (eg outside dual Doppler lobes)
- Discontinuous velocities, coupled with a smoothness constraint generated edge artifacts in vertical velocities
- Using a background sounding reduced these somewhat but still an impact
- Doing a multi-pass multi-phase retrieval was the best solution...

**Pass 1: Sounding -> High smoothing constraint 2D retrieval -> Final 3D retrieval**

**Average winds inside dual Doppler lobes**

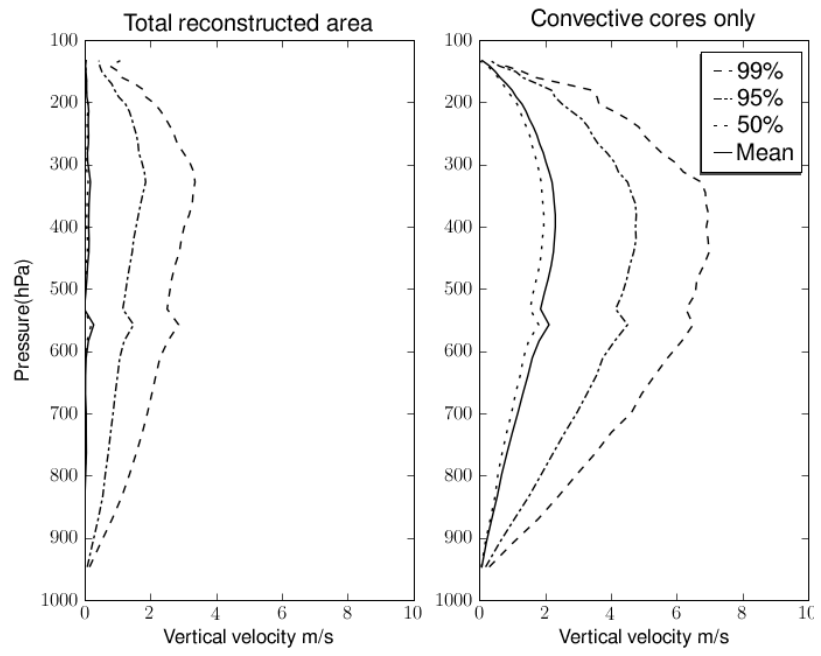


**Pass 2: High smoothing constraint 2D retrieval -> Final 3D retrieval**

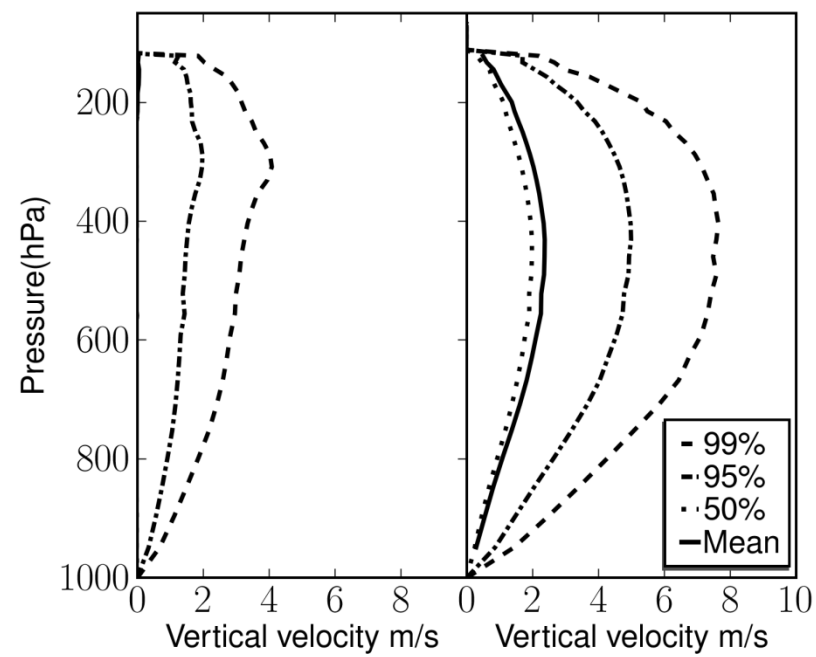
**For more information come and see my poster!**



# ... and now in 2010



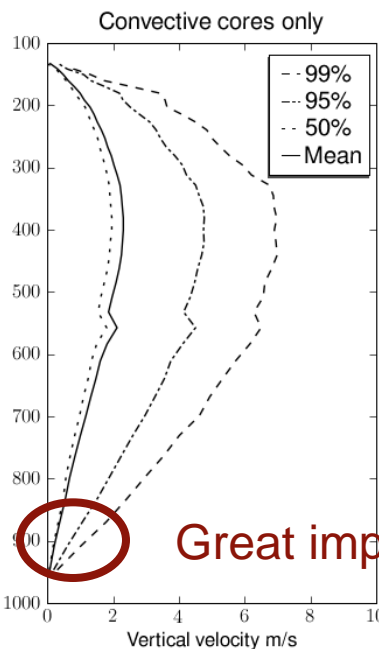
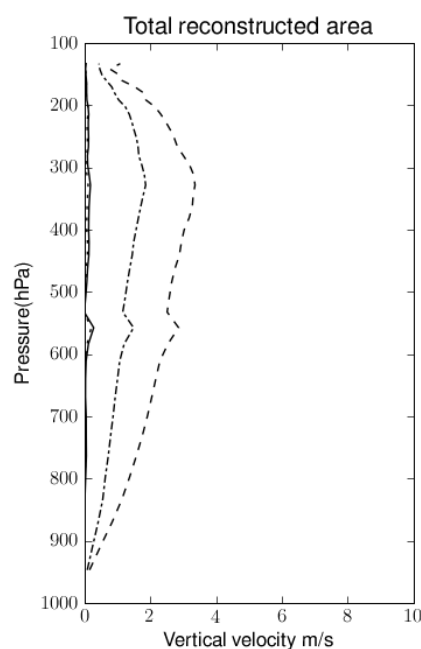
DD Lobes domain Convective cores  
%iles for 0400Z 19/01/2006 to 2350Z 22/01/2006



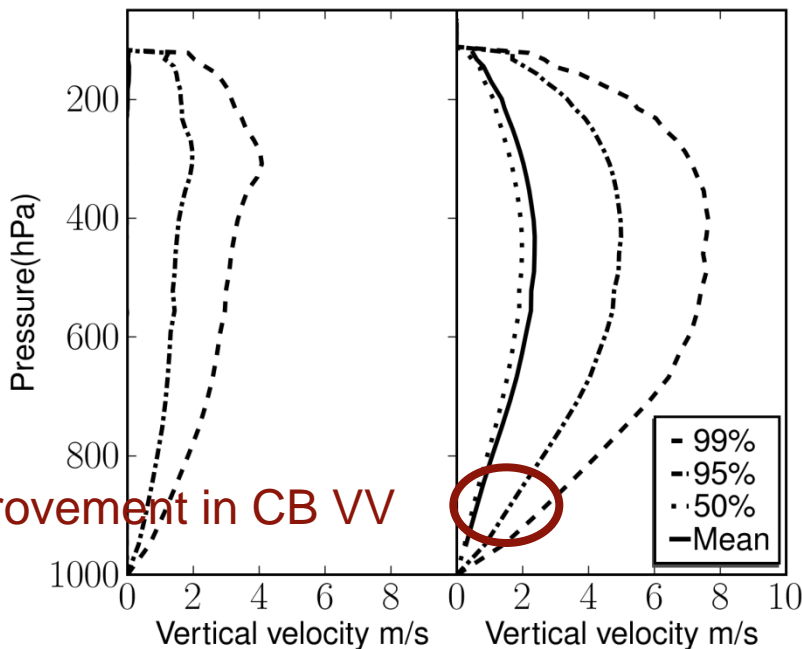
... and now in 2010



Only ~1m/s increased max VV



DD Lobes domain Convective cores  
%iles for 0400Z 19/01/2006 to 2350Z 22/01/2006



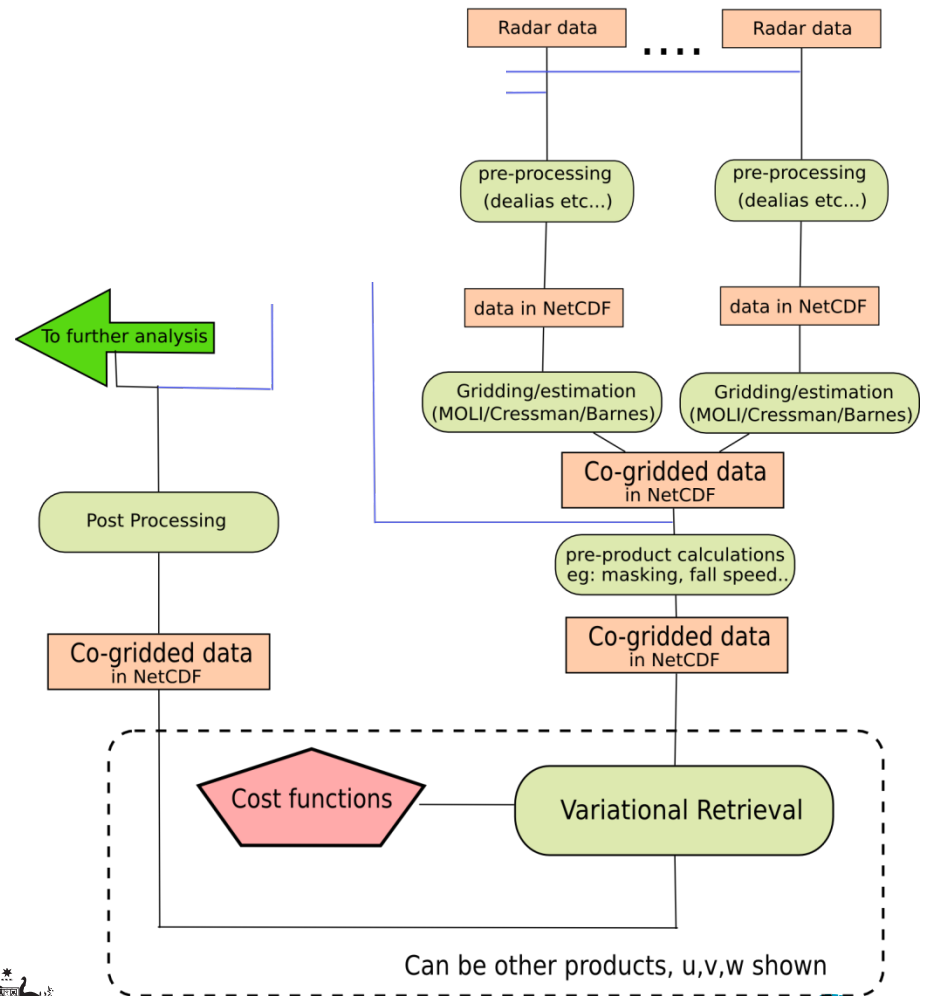
Great improvement in CB VV





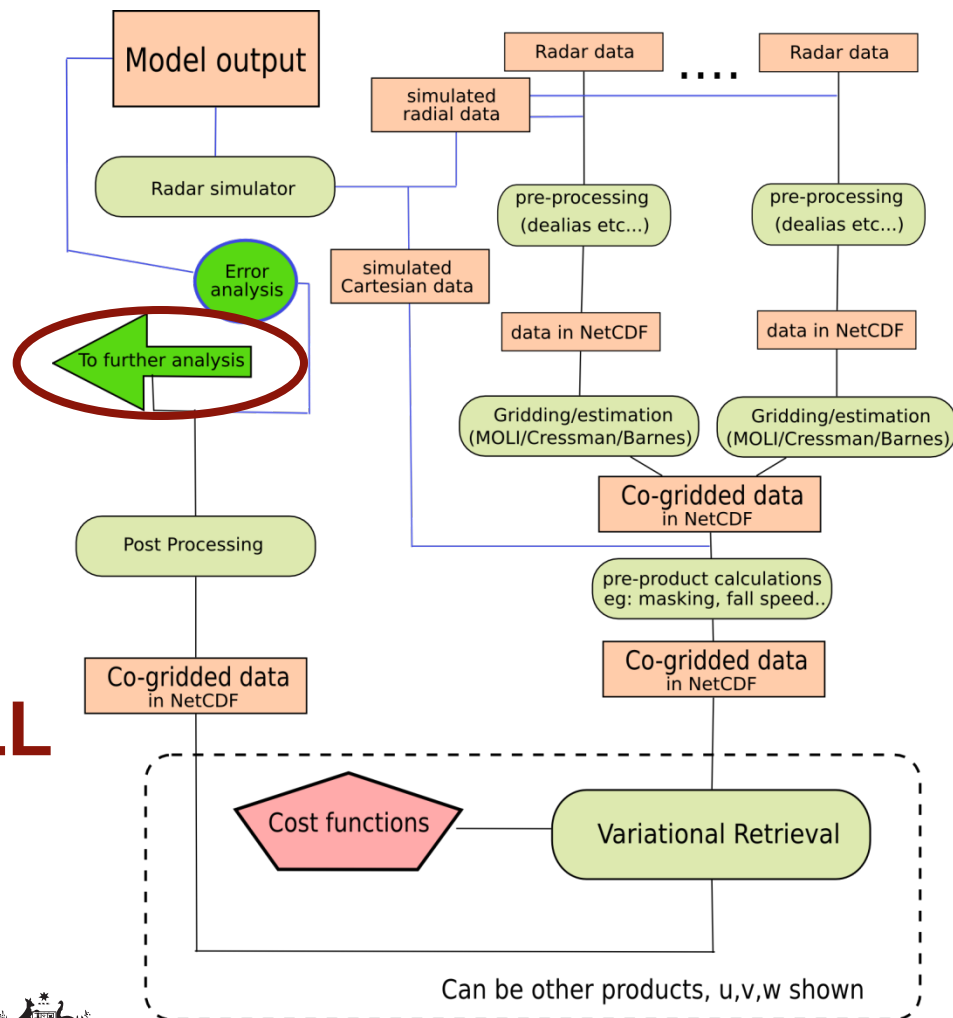
# Modularity

- Careful definition of file format (in progress)
- Open source
- Allows best practice retrievals to be implemented
- Allows choice in modules (eg algorithm for gridding a volume may not be the same for RHI)



# Testing

- Use CRM output and a radar simulator to generate synthetic radar volumes
- Allows testing of the *fidelity* of the retrieval
- Allows the testing of different gridding algorithms and investigation of the *impact of scanning strategies on maximum updraft*



**Genuine verification STILL required**

...and perhaps you should come have a squiz at my poster...

