GCSS PCS – a summary

Jon Petch

GCSS Precipitating Cloud Systems working group

- Recent case studies
- New case studies
- Plans etc…

Case studies – recent/on-going

Case 5 Transition of tropical convection (TOGA-COARE)

Coordinators: Woolnough, Willett, Petch

- An overview paper has appeared
- An NWP/climate model comparison paper has been accepted subject to minor revisions
- An SCM/CRM comparison paper is close to finished but Steve Woolnough has been and is unwell so the timescales are not clear on this
- Our best wishes to Steve …

Appeared

QUARTERLY JOURNAL OF THE ROYAL METEOROLOGICAL SOCIETY
Q. J. R. Meteorol. Soc. 133: 1087–1100 (2007)
Published online in Wiley InterScience
(www.interscience.wiley.com) DOI: 10.1002/qj.109

RMetS
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Modelling suppressed and active convection. Comparing a numerical weather prediction, cloud-resolving and single-column model

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Accepted (minor rev)

Modelling suppressed and active convection. Comparisons between three global atmospheric models.

M. R. WILLETT[a]*, P. BECHTOLD[b], D. L. WILLIAMSON[c], J. C. PETCH[a], S. F. MILTON[a] and S. J. WOOLNOUGH[d]
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in prep

Convective processes during the suppressed phase of the Madden-Julian Oscillation

S. J. Woolnough[a]*, P. Bechtold[b], P. Blossey[c], J.-P. Chaboureau[d], T. Hosomi[e], S. Iacobellis[f], Y. Luo[g], J.C. Petch[h], R. Wong[h] and S. Xie[i]

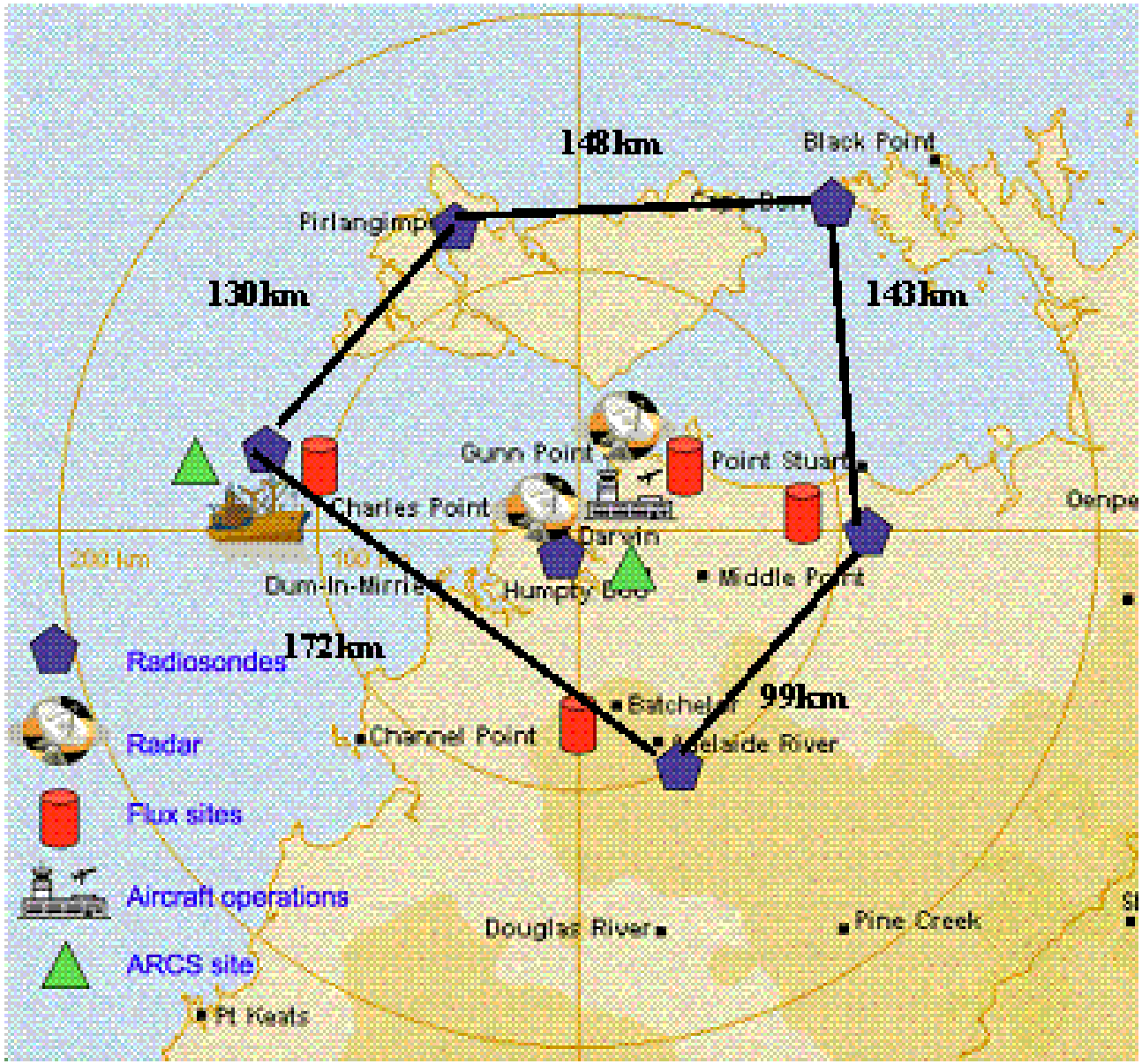
Case studies – new

TWP-ICE case: Convective transport, microphysics and the TTL

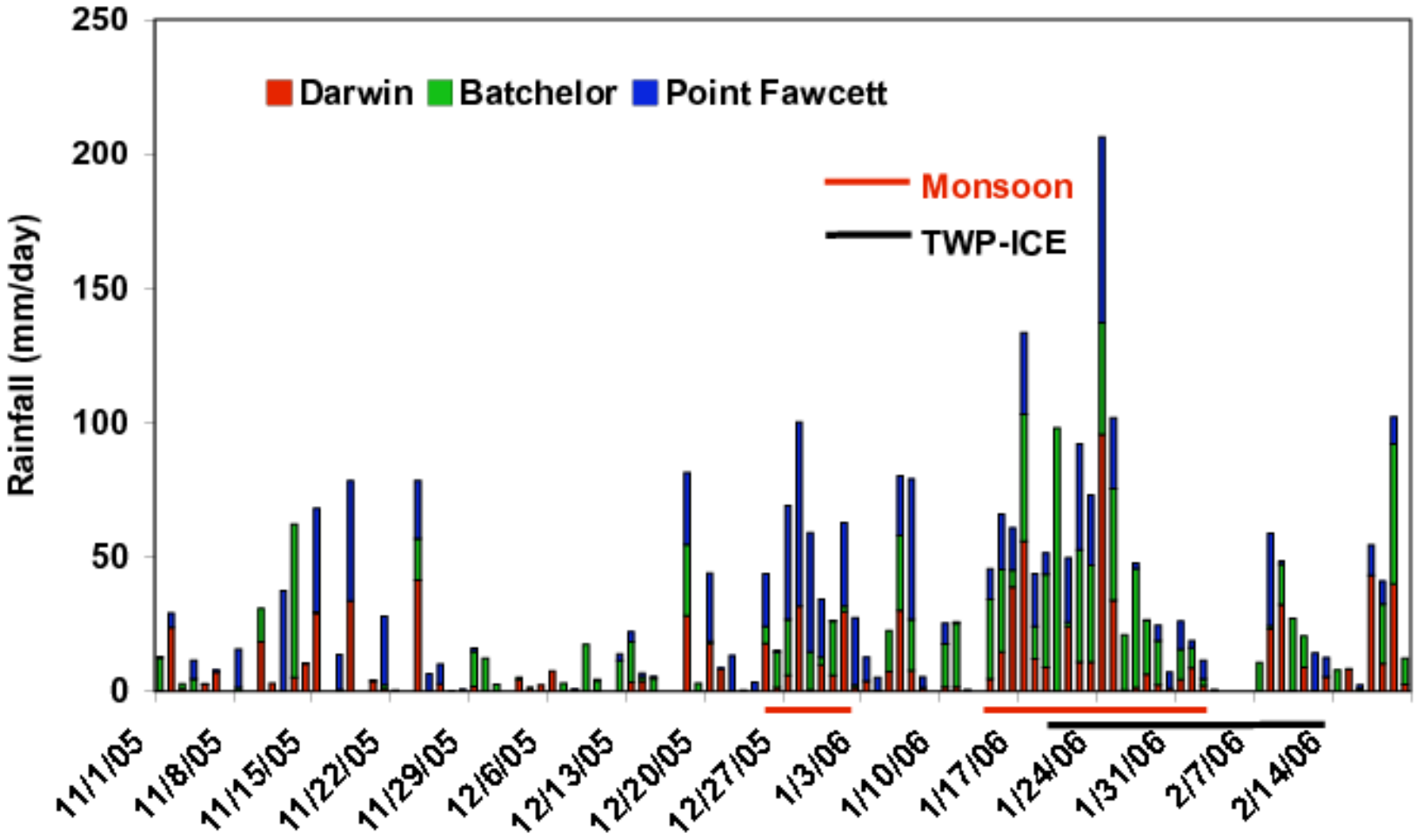
Coordinators: Fridlind, Jakob/Davis, Russo

- Well along the way to being released
- CRMs, SCMs, LAMs (NWP/climate??)
- Discussed on Wednesday

TWP-ICE: Overview

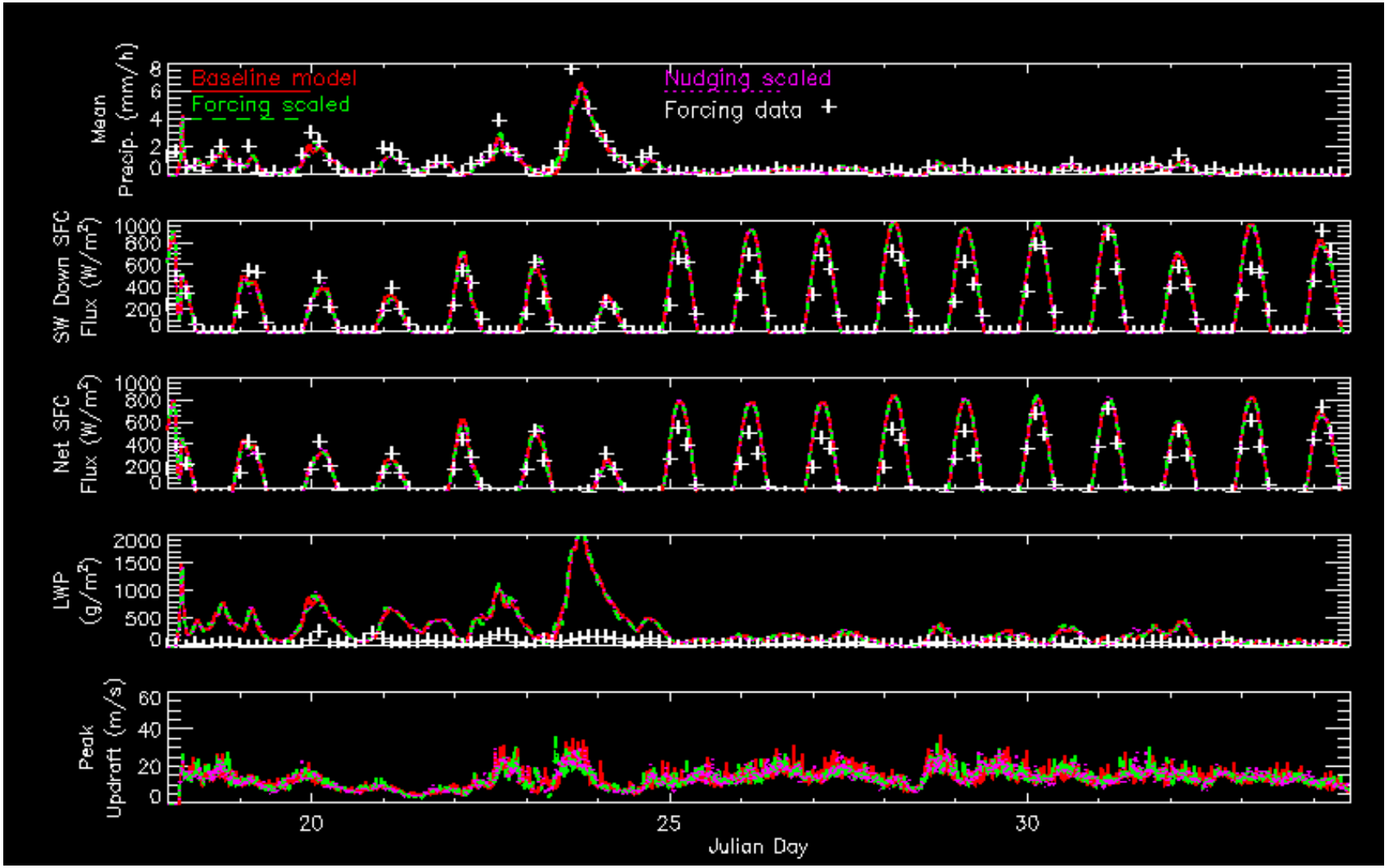


TWP-ICE: Conditions



Source: Lori Chappel, Australian BOM

TWP-ICE: Preliminary results



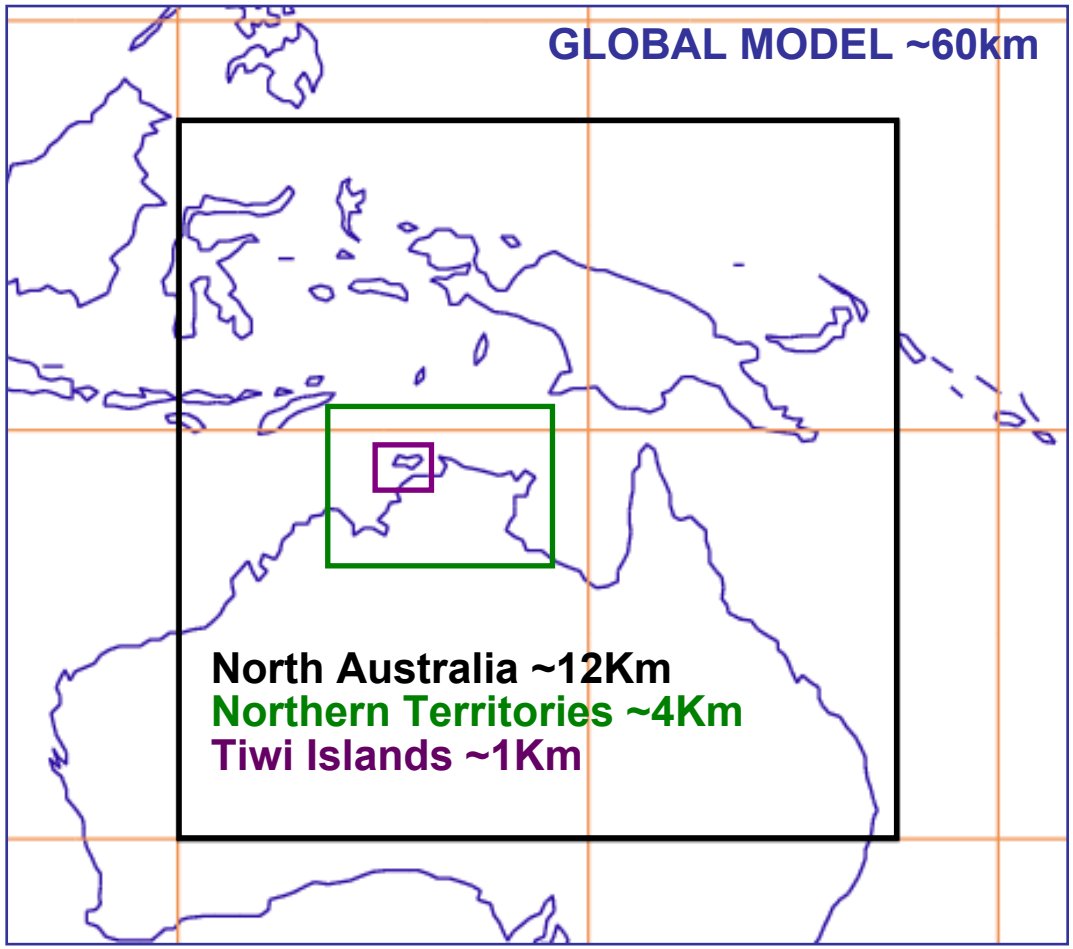
http://www.giss.nasa.gov/~fridlind/twp-ice

TWP-ICE: Next steps

Variable	Instrument/Retrieval	Approach	Model
Precipitation	Forcing data set	Continuous domain average	All
Surface radiative fluxes	Forcing data set, Long GRNDRAD	Broadband (and spectral?) fluxes, model values envelope local values temporally continuously	All?
Liquid water path (LWP)	Turner MWR	Model values (all columns) envelope local values temporally continuously	All
Ice water path (IWP)	Liu MODIS–ARSCL–Microbase retrieval	Retrievals envelope model domain average at finite times (+/-Δt?)	All
Cloud base and radar cloud top	ARSCL	Model values (all columns) envelope local values temporally continuously	All
Heating rate profiles	BBHRP, Schumacher radar	Investigate whether continuous or time-average fields provide best approach for comparison	All
Cloud top at tau=1	TRMM	Model values (all columns) envelope set of local retrievals at finite overpass times	All
Cloud top effective radius	MODIS	Compare histograms of retrieved values and modeled values at finite times (two MODIS overpasses per day)	All
Precipitation structure	Schumacher C-pol gauntlet	Compare frequency of areas above dBZ thresholds as a function of elevation?	CRM
UT/TTL water vapor	In situ Egrett measurements and in situ IWC	Model values as a function of IWC envelope measurements	CRM
Anvil ice habit	Cloud Particle Imager	Ad hoc at finite times (usable flight segments)	CRM
Anvil ice size distribution	Various in situ probe data vetted by Greg McFarquhar and IWC	Plot size distributions as a function of IWC and subsample model results to reduce sample size (model values should envelope measurements)	CRM
Rain drop size distribution	Disdrometer, Williams S-band retrievals	Plot size distributions under particular precipitation conditions as a function of elevation below cloud base	CRM
Joint dBZ–Doppler velocity statistics	Williams S-band reflectivity and Doppler velocity profiles	Compare fall velocity versus dBZ histograms at elevation intervals under specific precipitation conditions	CRM

TWP-ICE: LAMs (Russo)

Nested model approach:



Case studies – new possible case

Idealised study of the role of convection on theTTL

Coordinator: Grabowski

- A proposal
- CRMs, SCMs
- Discussed on Wednesday – it was agreed that it should build on early results from TWP-ICE
- Further discussion is needed to finalise

Case studies – looking a little further ahead

Convection over land – an AMMA based case

On Wednesday we heard about this – this is a longer term plan for us but it looks very interesting

Case studies – a general theme for the longer term

A comparison of oceanic and land based convection

Can we utilize the past and planned cases:

- ARM SGP (land)
- TRMM – LBA (land, semi idealized)
- TOGA-COARE (ocean)
- TWP-ICE (ocean, some land)
- AMMA? (land)

Case studies – some new ones

Some new case studies have been suggested at this meeting

These will be rolled out for feedback on the PCS maillist and web site

Meetings

- Preliminary results from TWP-ICE at ARM joint RPWG/CMWG fall working group meeting, Nov 17-21, 2008 (Princeton, NJ)
- ARM Science Team Meeting in March 2009?
- GEWEX Australia in August 2009?
- Follow up to last year's joint SPARC-GCSS meeting?

www.convection.info

Met Office

GCSS - PCS (Precipitating Cloud Systems) home page

WCRP ▸ GEWEX ▸ GMPP ▸ GCSS ▸ PCS

Recent news

- **[15/5/08]** Updates to the PCS web pages including the intercomparison page [html]
- **[13/5/08]** The 4th Pan GCSS meeting web page [html]
- **[13/5/08]** The agenda for the PCS WG sessions at the 4th Pan GCSS meeting [html]
- **[2/1/08]** The latest news of the PCS [html]
- Archive of news

Our main pages

- Intercomparisons: a link to all current and past intercomparison pages
- Published work: some publications related to our work (not updated since 06)
- Meetings: past and future meetings of our WG.
- Contacts: instructions on how to (un)subscribe to our maillist and other contact details

About GCSS PCS

The goal of the GCSS Precipitating Cloud Systems working group (PCS - formally DWG and WG4) is to improve the parametrization of precipitating cloud systems in global climate models (GCMs) and numerical weather prediction (NWP) models through an improved physical understanding of cloud system processes. The main tools of the GCSS PCS WG are:

- cloud-resolving models (CRMs)-- numerical model that resolve some cloud-scale (and mesoscale) circulations in either two or three spatial dimensions