Summary of Survey on Instrument / Translator Resources

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Cloud Properties Working Group Meeting

March 27, 2006 Albuquerque NM

130 to 145 Wiscombe,
145 to 200 Wiscombe,
200 to 215 DeVore,
215 to 230 Vogelman,
230 to 245 Jensen,
245 to 300 Schumaker,
300 to 315 DeMott,
325 to 350 BREAK
350 to 405 Mead,
405 to 430 McFarquhar/Jensen,
430 to 530 Open Discussion

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Motivation of Survey

- **Respondents asked to identify importance of and rank priority of VAPs and instrument needs**
  - **This avoids difficulty of proposal being labeled as "unimportant" in a plenary session**
  - **All items identified as potentially important were included in the survey**
  - **Should not only look at numerical results in evaluating survey (cost/benefit ratio; who will use the data)**
  - **1 or 2 people extensively using data to address relevant climate questions may make worthwhile**
- **27 respondents, some outside cloud working group**
  - **Confidentiality of responders maintained**

Nature of Survey

- **Survey requested information on importance of 10 translator activities and 28 instrument acquisitions/modifications**
  - **Separate questions on VAPs and instruments**
- **Responders identified importance of each VAP/instrument**
  - **1: should not be pursued**
  - **2: low importance**
  - **3: medium importance**
  - **4: high importance**
  - **5: extremely high importance**
  - **NR: not enough knowledge/background to answer**
  - **When mode was 5 I assumed it was very important priority (more significant than average)**
- **Responders also ranked instruments and VAPS from 1 to 10 in order of importance**
  - **Mode of rank probably may be best indicator (but not only) of the priority we should give (since ultimately we want people to be using the data)**

Survey Overview/Interpretation

- **Main point: Number of instruments that must be maintained/mentored steadily increasing**
- **Survey results suggest our first priority is to maintain core observations before adding other instruments/ VAPs**
  - **But, a few select VAPS and instruments with high impacts should be added**
  - **Seemed to be support for sunset committee so don't spend resources on instruments not well used**
- **Aside: Do we want to recommend increase in mentor resources to insure data quality?**
  - **but this might reduce funding available for new instruments**

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Priorities Identified by Surveys

- **VAPS: ARSCL, MWR VAPs, MPLNOR, MPL Polarization NSA**
- **Instruments: portable Raman lidar, 2x NSA sondes, AERI rapid sample mode, CCN counter, MPL spare parts, MMCR/WACR spare parts, 90 GHZ MWR, UV MPL**

VAPs: high Priorities

- ARSCL (4.8; 5)
  - Includes micro- and macro- VAP and translator time needed to insure quality of product
  - Although not explicitly stated in survey, we assume this includes needed translator resources for BBHRP & MICROBASE that have long been priority of our group
  - Some wanted to see these products for W-band and Ka band
- MWR VAPS (4.5; 5)
  - Continued development & execution of microwave retrievals, including LWC & IWC
- MPL Normalized backscatter profile (4.1; 5)
  - Requires development to run at all sites (requires averaging to improve retrieval & identifies up to 3 cloud layers)
  - Responder stated high priority to make more use out of MPL data
- VAP using polarization capability at NSA (4.1; 4)
  - Would aid in detection of mixed-phase clouds

VAP Recommendations: lower priorities

- Raman lidar VAPs (3.8; 3)
  - New VAP for retrieval of extinction, temperature, LWC & IWC
- VAP to correct for dry bias in upper troposphere (3.6; 3)
  - Correct for problems with Vaisala sounding in UT
- VAPS for BoM C-Pol radar data (3.2; 3)
  - Convert these data to user friendly ARSCL time series
- Implement data quality flag in existing VAPs (2.6; 3)
- Implement cloud classification scheme (3.2; 2)
  - E.g., Wang/Sassen algorithms; note some other retrievals will ultimately depend on this algorithm
- VAP to reprocess ARM TSI data (2.8; 2)
  - Would address circumsolar & horizon area retrieval problem
  - One respondent (modeler) suggested this would be first priority if could solve cloud fraction problem

NOTE: some low priority VAPS (C-Pol & dry bias) are relatively simple and already being developed

VAPS Rankings (in order)

- ARSCL
- MWR VAPs; MPLNOR
- MPL Polarization at NSA
- Raman lidar VAPS
- Dry Bias; C-Pol radar VAPs
- Cloud classification
- Data quality flag
- TSI reprocessing

Instruments: higher priorities

- Sonde releases 2/day at NSA (4.7; 5)
  - Launches will be staggered with those of NWS to double temperature coverage
  - Data exist to evaluate humidity measurements of NWS
- Any needed spare parts for MMCR/WACR (4.4; 5)
- Any needed spare parts for MPL (4.2; 5)
- Continued upgrades of AERIs to rapid sample mode (4.1; 5)
- 90 GHz microwave radiometers at all ARM sites (4.1; 5)
  - One responder queried if only 90 Ghz being considered; options with more channels?
- CCN counter for SGP and NSA (3.8; 5)
- Upgrade SGP/NSA to PIRAQ digital receiver if successful at TWP (4.0; 4)
- Ingest & collect spectra from W-band as needed (4.0; 4)
- Development of modular digital receiver for ARM radars (3.9; 4)
  - Needed for next upgrades
- MMCR Polarization at NSA (3.9; 4)
  - Aid in detection of mixed-phase and low clouds

Instruments: medium priorities

- Deployment of portable Raman lidar to TWP (3.6; 5)
  -Better measurements of extinction
- Obtain EBBR for Darwin (3.3; 5)
  - A lot of support from modelers for this item
- Obtain a scanning radar for SGP site (3.8; 4)
- Solve MMCR radome problem associated with wetting (3.7; 4)
- Support for Min's Oxygen A-band spectrometer for SGP (3.6; 4)
  -Will detect clouds missed by MMCR
- Address cross-polarization problem with MMCR at SGP site (3.6; 4)
  - refurbishment/repair of antenna could be 4/6 months down time
- Update AERI calibration for new model of black bodies (3.6; 4)
- Additional channel to Min's spectrometer for phase info (3.4; 4)
- Acquisition of UV MPL at TWP site (3.3; 4)
- Replace refurbished Digicora-II units at Manus/Nauru with Digicora-III units (3.3; 4)

Instruments: lower priorities

- Continued acquisition of IRTs at EFs (2.9; 4)
- Update AMF AERI to MAERI capability (2.7; 4)
- Acquire precipitation radar for Manus (3.5; 3)
- Faster sampling of microwave radiometer (3.5; 3)
- Borrow BoM C-radar for deployment during dry season (3.0; 3)
- Archive lightning detection data (2.3; 3)

Instrument Rankings by Mode

- MPL spare parts
- MMCR/WACR spare parts
- UV MPL @ TWP; 2x NSA sondes
- 90 GHz MWR
- AERI rapid sample
- MMCR PIRAQ; faster MWR sampling
- MMCR Cross polarization; MMCR spectra at NSA
- Digital AERI receivers; AERI calibration
- Scanning radar for SGP; Min spectrometer (extra phase info)
- MAERI; portable Raman lidar
- Min A-band instrument; CCN counter
- MMCR radome; WACR spectra
- Preciptation radar for Manus
- Digacore at TWP
- Lightning data

Not Ranked:
IRTs at ERs;
Borrow BoM C-pol;
EBBR at Darwin;
continually rotating RSR

Instrument rankings by average

- 2xNSA sondes
- MMCR PIRAQ; MMCR/WACR spare parts
- MPL spare parts; MMCR cross-polarization; AERI rapid sample
- CCN counter; 90 GHz MWR; WACR spectra; MMCR spectra at NSA
- UV MPL; Min A-band; Scanning radar for SGP
- Portable Raman lidar; AERI calibration
- MMCR radome; Digital receivers for radar
- Min extra phase channel; Manus precipitation radar; faster MWR sampling
- MAERI
- Digicore at TWP; IRTs at EFs
- EBBR at Darwin
- Lightning data
- Borrow BoM C-Pol radar
- Continually RSR

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Next Meeting

- Annapolis, MD, November 8 to 10 2006