

Working Group on Space-Based Lidar Winds
Destin, Florida
January 27 – 30, 2009
Action Items

1. Discuss with Decadal Survey Co - chairs, technology advances since Survey report. Update points on white paper that went to Decadal Survey. Show progress.		Baker Hardesty Mango
2. Change dates on <i>Space-Based Wind Lidar Roadmap</i> chart in Jack Kaye Briefing	Closed	Baker
3. Refine GWOS concept with NWOS enhancements		Mission Definition Team
4. Advance NWOS concept development <ul style="list-style-type: none"> • Estimate instrument cost • Perform mission conceptual design and accommodation study, encompass NexGen NPOESS orbits and platforms 		Mission Definition Team
5. Renew contact with Air Force & FAA		Baker Miller
6. Look at impact of alternative sources of energy on atmospheric modeling, especially with respect to complex terrain.	Optimizing energy production, planning, etc. Look at DOE papers, American Wind Energy Association	Wilkerson Miller
7. Discuss the importance of lidar global wind measurements to climate change research with NOAA Climate Goal Team Lead, Tom Karl.		Hardesty Baker
8. Scientific American or Discovery magazine article for popular educational value	Check with Bob Atlas, Frank Marks	Heaps Brown

Wintergreen VA
July 8 - 11, 2008

1. Update skill curves		Baker
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<p>vs. time and benefits</p>	<p>Close</p> <p>Forecast skill vs. time chart for 1960 thru 2007. Convert from anomaly correlation to \$. (below anom corr .6 = no skill, historical record is 5 day forecast)</p> <p>Completed Wayman converted to \$, showed power point slide, Lars Peter's economic model, from how much of economy is weather sensitive, \$12 Trillion economy, 1/4 to 1/3 is weather sensitive.</p> <p>~\$200M / hour of forecast skill</p> <p>2007 forecast skill worth about \$36 B / yr</p> <p>Delta per Weissmann & Cardinali ~ \$2 B / yr? Somewhat apples and oranges comparison, NCEP is northern Hemisphere</p> <p>3 to 3.5 % improvement in European Center corr coeff in best system in the world with lidar data vs. 1% per yr improvement in NWS -</p> <p>Dave Emmitt questions the conversion from anomaly corr to \$</p> <p>Mango suggests we put together the assumptions that went into this to make it clear</p> <p>Publish benefits paper so it can be generally used.</p>	<p>Miller</p>
<p>2. CAL / VAL Activities</p>	<p>Identify funding sources for the various ADM Cal/Val activities. (NSF, Hardesty check with NCAR, and other). Investigators find their own funds.</p> <p>Task descriptions, proposed funding source, and when funds are needed – to Hardesty July 16 2008. Prioritize list of tasks based on ranked categories, connect to instrument performance and risk reduction for a U.S. demonstration mission. (Kicza requested info for fy10 cycle).</p> <p>Identify other wind observing systems for cross comparison</p> <p>Identify use of ADM to reduce NexGen risk</p> <p>Hardesty – proposal submitted and accepted, provides access to data but no funding</p> <p>Trying to identify \$1M funding within NOAA (NESDIS & OAR), briefed Kicza, submitted request to director of OAR, don't know status, meeting early February on funding (Hardesty)</p> <p>Want to go to NSF too</p>	<p>Hardesty</p>

	ADM delayed April 2011	
3. Explore benefits combine with 1 above	<p>Benefits to insurance industry</p> <p>Brown has insurance contacts – look at how ins companies handle episodic events and global warming, they are seriously interested. They tend to not factor in episodic events. Don't forecast long term, just recalculate year to year.</p> <p>Emmitt – Works for AIG, gives seminars on broad scope of threats, their horizon is short. Don't really address tails of distributions,</p> <ul style="list-style-type: none"> • interested in very short term reaction to episode, mobilize before theft and damage etc., spread risk broadly • long term – just along for the ride – where they invest is a major interest more than what they insure <p>Episodic events</p> <p>1/3 of US economy \$4 trillion is in weather sensitive industries, NOAA just published analysis – relook at benefits of wind data.</p>	Miller Brown Emmitt
4. GWOS / NWOS Studies	<p>Next steps for GSFC IDL/MDL studies.</p> <p>Identify issues: Orbit options (1330, 1730 (dawn/dusk), other), S/N, power considerations for different orbits, accommodation, maneuvering, diurnal wind variations, and conops.</p> <p>1330 comes first in NexGen sequence, then 1730, need to be capable for either one</p> <p>SOW to Mango July 18 2008</p> <p>Use of ADM to reduce NexGen risk</p> <p>Mission conceptual design, accommodation, requirements, conops</p> <p>Briefed Dan Stockton, Program Executive, July 30,</p> <p>Briefed Jack Kaye</p>	Baker Gentry MDTeam
8. Forecast impact per \$ cost of sounding, comparison with rawinsonde	<p>Close</p> <p>Cost of rawinsonde network for global coverage, consider rawinsondes also provide temperature and moisture</p> <p>US \$10M per yr for rawinsondes, \$500M satellite 5 yr mission, \$100 M per yr, complements</p> <p>Cost per sounding of rawinsonde vs. space lidar Benefit per sounding of r vs. s.l.</p>	Miller Baker

	<p>Apparent consensus is never get rid of rawinsondes</p> <p>Tradeoffs include ability of rawinsonde to react to short term crisis adjustments</p> <p>Brown – When they had QikScat data, the buoy data was negative benefit because it was inaccurate</p> <p>Dave Emmitt – OSSEs would would be a way to explore the question</p> <p>Rawinsondes will always have gaps</p> <p>Merge with economic AI and drop Bowdle name</p>	
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Action Items Monterey January 2008

<p>1. Plan for Display Booth or Session at AMS special meetings e.g. hurricanes, aviation AGU Conference – had a good session</p> <p>LaRC can order display hardware once identified LaRC can have large graphics made (MJK) Generic display, can be used for any conference</p> <p>Hardesty requested special session, hasn't heard back</p> <p>Bob Brown provide suggestions to Michael Kavaya</p> <p>Could do it again, but need 20 papers for a session at AGU</p> <p>Emmitt suggested we collaborate with wind energy industry</p> <p>Explore and start early to get critical mass for next AGU session for next meeting (Hardesty)</p> <ul style="list-style-type: none"> • include wind energy (maintenance and power prediction) • airline fuel savings <p>green technology</p>		<p>Kavaya Hardesty Brown</p>
<p>2. Re-examine aerosol background mode.</p> <p>Funded and in progress</p> <p>Emmitt - SWA / TPARC P3 lidar did background structure study, overlaid it on CALIPSO data. P3 got a lot more return below 3 km than GLOBE suggested. Is CALIPSO measuring the same thing?</p> <p>Falcon data is available too.</p> <p>CALIPSO 532 nm and 1 micron, Dave at 2 micron, LITE</p>		<p>Bowdle Emmitt</p>

<p>3. Formalize collaboration on</p> <ul style="list-style-type: none"> • Post-ADM mission planning • Reducing latency for North America and Southern Hemisphere (Lars Peter) – identify additional ground station so we can get data quicker • Joint OSSEs for ADM & follow-on mission 		<p>Baker Riishojgaard Hardesty Emmitt Gentry Reale</p>
<p>4. Brief Ken Leonard, FAA Aviation Weather, on Aviation benefits modeling – positive reaction, but didn't find FAA contact ready to work with us</p> <p>Follow up on route planning – Emmitt contacted FAA people who have routing models, waiting for response – FAA had 2 action items from discussions with Emmitt</p> <p>Dave found a free route planning tool – we could follow up on this</p> <p>Need to firm up the relationship between improved weather forecasts from winds and cost savings from route planning</p>	<p>Completed</p>	<p>Baker Emmitt Miller</p>

**Snowmass, CO
 July 2007**

<p>6. Define experiment to compare single-LOS vs. bi-perspective (2 LOS in close proximity) using T-PARC data with more than one assimilation system.</p>	<p>Underway</p>	<p>Riishojgaard Emmitt Weismann</p>
<p>10. Assess Post-ADM scenario with GWOS in 60 degree orbit</p>	<p>Funded NASA ROSES 07</p>	<p>Emmitt</p>
<p>11a. Assess aviation needs for direct wind profiles vs. just weather forecast improvements.</p> <p>Also an issue with military – compare actuals with models to improve weather models</p> <p>Real time discrepancies between forecasts and actual</p> <p>Identify air pockets, Clear Air Turbulence, in real time?</p>	<p>Funded and ongoing</p>	<p>Emmitt</p>
<p>12. Develop plan for airborne participation in Hurricane Genesis Mission (NASA-led DWL field campaign in ROSES 09 for Hurricane Season 2010). Respond to expected NRA.</p>	<p>Awaiting NASA HQ decision on the NRA.</p> <p>Ramesh talk Jan 09</p>	<p>Gentry Hardesty Kavaya Emmitt</p>

Miami, Florida
February 6 - 9, 2007

4. Brief New NHC Director	Check with Bob re new Director	Atlas
8d. NASA Aeronautics, NIA, NGATS Input	Emmitt contact @ Langley, planning workshop on use of winds in NGATS Combine this with the aviation Action Item	Emmitt
8f. Seek support for a DWL mission from the Tropical Meteorology community.	Attend AMS and other tropical research conferences, present papers. NOAA Hurricane Research division is supportive, wants aircraft DWL hurricane reconnaissance first. Presentations at AMS Tropical meetings would help, especially with aircraft observations in Saharan air layers, and near tropical disturbances and storms.	Atlas
12. JCSDA develop core OSSE capability for evaluating wind lidars and related instruments	JCSDA made this a key focus area. Submitted funding request NASA funded efforts ongoing – adaptive targeting, ROSES 07	Baker Riishojgaard

January 2006

13. Inventory the various wind lidars for wind measurement. Gary Spiers had a website with a start on this	Put list on USRA Website.	Emmitt Hallmark
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June 2005

6. Use CALIPSO, GLAS data to improve existing models of aerosol backscatter at both UV and NIR	Emmitt paper @ Snowmass	Emmitt Winker
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wavelengths.	Moved from cloud statistics, now looking at aerosols.	Spinhirne Bowdle McGill
9. Maintain liaison with ADM; improve the information exchange with ADM; encourage an ADM person to attend future LWG meetings.	Maintaining liaison. Marseille presented status @ Destin Jan 2009 Reitebach presented status of ADM @ Monterey Feb 2008 Weissman presented updates at Summer LWG meeting Hardesty and Yoe attended ESA ADM meeting. Endemann attended Winter 2007 LWG meeting. Wayman requested FY10 NOAA funds to evaluate ADM data.	Hardesty Riishojgaard
12. Interact with transport studies community, Army battlefield, boundary layer thru stratospheric transport Walter Bach funding this Good paper at recent AMS	Ongoing Ted Shepherd (Canada) talk Monterey Feb 09. Lars Peter invite GSFC people for talks Bach talk on reqts?	Hardesty Riishojgaard Bach

June 2004

7. Articles for refereed literature on advances in lidar technology, OSSEs, ground-based and airborne measurements, etc. since the BAMS 1995	<i>J. Yoe chair discussion of BAMS II article</i> Bob is working on refereed article on OSSE results.	Atlas Emmitt Ryan Wilkerson Yoe
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Note: Missing numbers correspond to closed action items.