OWLeS Planning Meeting
Boulder, CO
June 24-25, 2013

Attendees

Brigitte Baeuerle, NCAR	Neil Laird, Hobart & William Smith Colleges
Bob Ballentine, SUNY-Oswego	Scot Loehrer, NCAR
Rich Clark, Millersville Univ.	Justin Minder, SUNY-Albany
Linda Echo-Hawk, NCAR	Bob Rilling, NCAR
Michael Evans, NOAA NWS – Binghamton, NY	Jim Steenburgh, Univ. Utah
Jeffrey Frame, Univ. Illinois	Scott Steiger, SUNY-Oswego
Jeff French, Univ. Wyoming	Leslie Stoecker, Univ. Illinois
Bart Geerts, Univ. Wyoming	Greg Stossmeister, NCAR
Gary Granger, NCAR	Junhong Wang, NCAR
Vanda Grubisic, NCAR	Steve Williams, NCAR
Kevin Knupp, Univ. Alabama - Huntsville	Josh Wurman, Center for Severe Weather Research
Alexei Korolev, Environment Canada	George Young, Pennsylvania State Univ.
Karen Kosiba, Center for Severe Weather Research	Dave Zaff, NOAA NWS – Buffalo, NY
Dave Kristovich, Univ. Illinois	

Day 1 – June 24
Scientific Objectives

1) OWLeS: Lake Ontario Long Fetch Systems-Scott Steiger & Jeff Frame
    a. Climatology of snowfall east of Lake Ontario (Oswego and Hooker).
        i. Most occurs in Dec and Jan but another peak in Feb.
    b. Convective nature of the band.
        i. Circulations more complex than simple model.
    c. Looking at hydrometeor type.
        i. Inconsistent type closer to **[variable?]** 0.
        ii. Want better ground truth of the type. (Use black felt boards with scales?). For this get more detail on the surface.
            1. System that takes 3D pictures. (wanted 40K for it)
            2. Possibly two groups of volunteers near each other to compare
        iii. Diurnal cycle is important to keep in mind. Strongest at night.
        iv. Mesoscale variability: did extrapolation to down stream since there's trees and problems near the radar site
        v. With aggregates there were higher reflectivities near the top than with the pellets and aggregates
        vi. Will have 3 DOWs, might need to have a tight flight pattern to get ground truth
    d. Lightning
        i. Lake effect lightning effects happen about 3-4 times a year. (Can happen in February but mostly Dec-Jan)
        ii. When to worry about having too much lightning to fly? 1 flash!
            1. Need to have good communication - avoid KA getting struck by lightning
            2. Lightning detection companies and electric-field monitoring.
            3. If observers hear thunder

4. Could fly over storms, usually around 3km deep.
5. Depth of cloud is a good predictor of lightning
6. Real-time data resources will be provided on the ground for real-time guidance
7. Include lightning forecast in the forecast process

e. Main goals:
   i. Understand how long fetch evolves from the western to eastern shore
   ii. Understand cloud and dynamic processes (lightning)
   iii. How radar dual-pol variables at X- and S- band reveal precipitation processes
   iv. How well dual-pol particle ID and QPE algorithms perform
   v. Use dual-Doppler to look at supercellular structures and other mesoscale in-band structures.

f. What will be used: 3 DOWs, MIPS, snow sites, weather pods, soundings and UW King Air (Riming could be a problem)
   i. Fly 1000ft over the lake. Height is a problem over land with Canada and US coordination.
   ii. Coast Guard could launch their boat in the lake to do Rawinsonde launches. Scott will contact them. (add to the Ops Plan if they agree; who would ride with them?).

2) Karen Kosiba and Josh Wurman
   a. Objectives
      i. LLAP bands: Meso/miso scale structure, kinematics, & associated precipitation.
      ii. Compare X-band and S-band dual-pol fields
   b. Look at different boundary layer features on the small scale and how smaller scale structures interact with the larger ones.
   c. Instrument needs: Disdrometers, dual-polarization radars, surface obs of temp & RH, surface obs of precip type/size, environmental vertical temp profile, in-situ aircraft obs through boundaries
   d. DOW Scan needs: fine-scale DD (dual-Doppler) structure and microphysics (vertical scans and RHIs for microphysics), rapid updates, LLAP bands - shallow
      i. DD baseline: 20km or less (since there are 3 there could be a lot of combinations for this)
      ii. Vertical depth about 3km
   e. Landfill site North of Seneca lake-can do 360 deg scans down to 0 deg elevation
3) Throughout project watch upwind lake ice cover-MODIS?
4) Summary of UAH instruments and operations for the OWLeS campaign- Kevin Knupp
   a. MIPS
      i. Instruments
         1. Doppler wind lidar in its own trailer. (Vertically-pointing or RHI)
         2. 915MHz Wind profiler
         3. Electric field obs
         4. X-band Profiling Radar
         5. CL51 ceilometer
         6. Doppler wind lidar (scans in 3 different modes)
         7. Video camera
         8. Surface instrumentation
         9. Parsivel disdrometer
         10. Electric field mill

11. TPI hot plate precipitation gauge
12. Particle video imager (from NCAR)

ii. Issues
1. Exposure
2. Hot plate and Parsivel need low wind speeds and flat surface
3. DWL needs clear view of water surface for wind measurements (Lidar can be separated from MIPS)
4. Radar profilers better when surrounded by trees (100 ft away)

iii. Suggest put MIPS near radar, co-located with sounding site.

5) Development of a Video Disdrometer-Particle Video Imager-Paul Kucera (Bart)
   a. SVI-3D images of snowflakes
6) UWKA observations in OWLeS-Bart Geerts
   a. 3 methods for scanning cloud radar
      i. Vertical plane (VPDD) – 30 degrees
      ii. Profiling
      iii. Horizontal plane (HPDD)—35 degrees
   b. Winds are both fall speed and vertical winds (when vertical)
   c. Horizontal range is limited based on depth of system (~8km)
   d. Radar can have up to 4 operating directions at the same time (same amount of power). But the more directions, the less sampling rate.
      i. Combination can be changed during the flight.
   e. Lidar
      i. See cloud base/cloud top
      ii. Can operate up and down but puts limits on the power.
      iii. Depolarization good distinction between cloud liquid and snow
      iv. Can change up/down/both during the flight as needed.
   f. Droplet measurements
      i. PCASP – aerosol measurements.
      ii. CIP-imagery of flakes.
      iii. FSSP – not as precise as CIP and is affected by ice crystals
      iv. 2DP – good for larger profiles
      v. 2DC – good for drop size distributions.
   g. Water vapor and CO2 fluxes
   h. Downward video (1 frame/sec)
   i. Pyrometer and pyrgeometer
   j. Liquid water (DMT LWC-100, Gerber, FSSP and DP)
   k. Will know aircraft position within a couple of m (useful for pressure variations)
   l. Objectives
      i. 2D kinematics and snow band dynamics
      ii. snow growth mechanisms
      iii. dual pol particle ID & QPE
      iv. Large eddy simulations of snowbands (dynamics & QPF)
   m. 4 seats (Flight Scientist, data scientist, pilot, and 4th seat - students or others)
7) Alexei Korolev
   a. Welcomes input for a Lake Huron project in a few years
   b. They may have 1 or 2 flights during OWLeS but have another campaign going on
8) OWLeS Scientific Research Objectives-Neil Laird & Nicholas Metz
   a. Lake Ontario lake effect climatology

i. More likely to see mixture events. (many cases where the morphology is far from clear)
ii. About 40% of days with lake effect
iii. Undefined stays steady, windspread (short-fetch) has more events, shoreline a bit less.
1. Transition events occur so there may be problems deciding which event to set up for (long or short fetch).

b. Small lakes (Finger Lakes vs Ontario)
i. Topographic forcing
ii. Downstream interactions

c. Priorities
i. Transitioning types (SYNOP, LOenh, FL, Trans)
ii. Hoping for 3 short fetch events to model.

d. Some really low frequency years and some really high years. Lots of inter-annual variability

e. Flights between Ontario to south of the Finger Lakes

f. Predictability based on wind direction (really narrow band of wind directions for these to happen)

9) Dave Kristovich
a. Interest
i. Influence of upwind lakes
ii. Transitions in the boundary layer
iii. Ice cover over the upwind lakes, and the effect it has.

b. Western region of Lake Ontario and northern shore

c. Target 300 degree winds to get bands from Huron.

d. There are 2 sounding sites between Huron and Toronto (EC and UIUC).

e. Would like 1 set of flights with clouds visible, but if other lakes aren't ice covered, they will also have influence on PBL.

10) Rich Clark, George Young, and Todd Sikora
a. What's keeping rolls alive??

b. Downdrafts and updraft.
i. Find the structure of the rolls

c. Do they need to have radiation information?
i. Ferry flights between lakes should get that information.
ii. Mostly interested in buoyancy
iii. May not want to punch into cells

d. Support downwind persistence

e. Discussion re how feasible it is to support the other projects

f. 2 tethered balloon systems, depends on the event
i. flies more like a kite.
ii. Larger balloon, 2000 cu ft.
iii. Deploy in a parked situation, battery works for 10ish hours.
iv. Particle condensation counter.
1. Get into the cloud deck? Would usually be below.

11) Jim Steenburgh and Justin Minder
a. Questions
i. Interactions between environment, cloud processes, lake shape and size, terrain scale and orographic precipitation enhancement

    ii. How orography modifies the morphology of systems and the generation, distribution and intensity of the precipitation over lowland areas
b. Orographic and Lake size comparison
    i. Big Lake and Big Terrain-Japan
    ii. Little Lake and Big Terrain-Salt Lake
    iii. Big Lake and Little Terrain-Ontario
    iv. heaviest snow at mountain top vs cases where most snow at lowlands (ie, low-altitude capping inversion)
c. Climatology
    i. Dec and Jan
    ii. A third of the events lasted over 24 hours.
d. 4 MMRs-vertically pointing, real-time, possibly for multiple months
    i. One near coast
    ii. One near plateau
    iii. Two up higher in north/south line
    iv. Keep them out from Oct-Jan, Albany's may stay out the entire season through Mar
e. Hopes to have MASC; 3-dimensional images of snowflakes
f. To use others
    i. UWKA
    ii. MIPS
    iii. MUPS
    iv. DOW
    v. Oswego (manual sampling)
    vi. Wyoming-Hotplate and WXT 520 station
g. Numerical Modeling
    i. Evaluation of the models
    ii. Detailed diagnostics
    iii. Sensitivity experiments
    iv. Identification of parameters.
h. Equipment is stationary

12) Bob Ballentine – simulations of LE snow bands
a. Real-time 12-km grid larger scale, 4 km over eastern region of Great Lakes
b. Looking into having a larger region and/or smaller resolution over the study region
c. Early look out 36 hours, then a 72 hour run for longer-term planning.
d. Sub-grids of NAM can be used in real time
e. Will be looking and comparing models for several Lake Effect cases
f. Can do a case in the modeling. May need to go down to 1km.
g. Moist physics
    i. Several options (Goddard or 3 phase scheme)
h. PBL options
    i. YSL scheme
i. Re-iterated that the flow will often be from NW, turning more westerly by the time the air is over Lake Ontario (so, almost looks like a composite NW flow case, shore parallel wind case; might be an interesting issue when deciding flight hours (for long-fetch or short-fetch)
j. What about rapidly changing band location. Where do you deploy?

k. Interest in assimilating sounding data into their early runs. Would prefer to have data within +/- 1 hr of 12Z, 18Z, 00Z, and 06Z.
    i. Ask Enviro-Canada to launch some rawinsondes from King City?
        1. Can be done according to Alexei

Rawinsonde Intercomparison-Junhong Wang

1) Very good comparison btwn 3 diff sounding systems
    a. DF-09 and Vaisala; as good as any in the community
    b. Important because it takes a long time to complete adjustments to the sounding
    c. Learned that it is important to know how the soundings inter-compare beforehand
        i. They've seen significant differences between soundings sent up on the same balloon; esp in RH
2) Easiest to attach three on the same bar (bamboo bar, horizontal, sondes balanced on it)
3) For GAUS, they always compare sfc obs btwn sonde and an independent sfc obs – perhaps should have all sites do this! Suggestions on the surface sensors to use for this?
4) Look out for "bad" sondes!!
5) Rising rates
    a. For RS-92; dry spikes seen at the slowest rise rates
        i. Strong suggestion that should have a rise rate of at least 3 m/s – not enough aspiration; says it is unique to RS-92
    b. Not as big of a problem for the GRAW
    c. Most recommend 5 m/s; actually we all use 3 m/s
6) Wetting
    a. RS-92 has this taken care of
    b. Did not see this problem w/ Graw, but is really unknown. Might get icing on the cover
7) Icing problems
    a. Can affect the rise rate substantially
    b. They have a case of it happening into a loop of upward then downward motions of the balloon
    c. Could also be affected by rise/sinking of air
    d. Tried putting non-stick spray; helped
    e. Also can increase the rise rate
8) Temperatures
    a. If go fast, aspiration is more important
9) Data processing
    a. For DYNAMO, they had six types and 12 formats
    b. Had a utility to provide consistent sounding data format and processing
    c. Steve Williams said they have already built this in
10) Comparisons
    a. Want at least one day and one night launch; consistent launch of more than one system; prefer 3 of each
11) Wind issues

a. Icing can make the balloon behave differently – pendulum effect is filtered out

Other Sounding Info

12) Use consistent ascent rates (3 m/s)
13) Buy sondes from same lot so there's not differences within the brands
14) Venting beforehand is great, but it probably won't be prudent in this situation
15) Velcro cloth for fixed width can easily be sewn together.
16) Data format—NCAR has converters for a number of different data types. Put it all into an ASCII EOL format.
    a. Will keep QC'd and raw data.
17) Start ordering helium because each group will need at least 10 large tanks. Stockpile at some University
    a. Send Helium amounts needed to Rich?
    b. May need to store in both Oswego and Geneva?
    c. UI's will have to be in Canada
18) Gary Granger – they have a script that takes the 1hz data being stored to the PC and continuously regenerates the sounding plots

Transfer of Real-Time data

1) For GAUSS and VORTEX2
    a. Records are pulled into EOL,
    b. Datagrams, low bandwidth, sounding files can be rewritten any time.
    c. Can it be done when sounding is nearly done?
        i. File format may be an issue, if it's something that can be sent on the file
        ii. Internet connection could be an issue.
    d. 2 issues
        i. The ultimate datasets for research
        ii. Also need for decision making
    e. Limits on what the operator can do at any one time.
2) Continuous feed might be nice but not necessary
    a. Might be the best after an hour from launch.
    b. Autonet mobile, makes where you are as a mobile hotspot.
    c. Mobile threatnet. Not internet access but look at radar data from anywhere using satellite.
    d. Go to the field catalog

Rawinsonde, DOW, Surface Facility Siting

1) Long-fetch events
    a. Rawinsonde
        i. UIUC - upwind locations have to be determined
        ii. Utah - Upper Redfield Soundings
        iii. MUPS - Sandy Creek school currently, unless it's the tethered balloons. Can move relative to the Utah site.
        iv. Oswego - could move but will be south of the band.
        v. Geneva - will be north of the band (Oswego and Geneva may switch to reduce drive times for Geneva group)
    b. MIPS
        i. Hopefully near Sandy Creek spot, but with ability to move

ii. The best would be to not move with the band, but see the variations through it.
iii. Might be nice to have a few fixed sites for MIPS and MUPS. One for the classic and one for the south band.
1. South will be around Fulton.

c. MRR
i. See Y layout in Steenburgh slides.
ii. Maybe change the Y location to Sandy Creek. Get the change along the band.

d. Scott and Jim will work on setting up the plans.
e. Will determine locations for the DOWS and aircraft at a later session.
f. What about easterly flow situations? Decided that these are not highest priority

2) Short-fetch
a. MUPS
i. Plan A & B Moving to near the Gorham-Stanley-Hall (further from the Finger Lakes)

b. Rawinsonde
i. Plan A Geneva- Southern Seneca
ii. Plan B Geneva – Southern Cayuga
iii. Plan A Oswego- near the shoreline or near the landfill (just north of Seneca Lake)
iv. Plan B Oswego- ??
v. UIUC still upstream.

c. MIPS
i. Plan A Near the shoreline-Sodis Bay, open access at a state park.
ii. Plan B Hamilton Beach

d. DOW
i. Two near the shore
ii. One at the landfill

e. Neil will write up two plans for the short-fetch

3) Northeast/East flow??
a. Only if it's the end of the project and there are lots of hours.

4) Ice Storm scenario?
a. Very different, but it might be a system to investigate; moving around might be a problem

Day 1 – June 25

Flight Tracks

1) 75 research hours
2) 43 day period
3) Limitations
a. Crew day- any day the pilot or crew has to show up. (even if they don't fly it counts as a crew day)
b. Can only have 6 crew days in a row
c. Can do 2 flights in a day.
i. 1.5-2 hour downtime between flights

d. Least amount of duration 3.5 hours but can probably expect 4 hour
e. 14 hours is the maximum time in a crew day.
f. If flight late in the day, can't show up early the next day

    g. Circadian window-if it's an encroachment they have to reduce the length of the day by the same amount of time
4) Night time patterns
    a. Need to plan 2 days in advance
    b. Need 36 hours to switch biological clocks.
    c. Aren't going to get to 500ft over the water at night. Maybe 1000ft, but may be unlikely too.
5) Fluxes – to est surface fluxes, need daylight hours to fly low enough.
    a. Can operate in non-daylight
    b. If 5:00 AM start of day, earliest can take off at 7am or so.
    c. The later evening flights are going to be constrained by the daylight hours more than the early morning.
    d. Flying after sunlight might be better to develop flight plans for VFR earlier in the flight
6) Decision
    a. No night time flights
    b. 6:30am earliest flight, latest return 11pm
    c. If they do decide to do night flights, need to discuss with ATC (Sept)
    d. Night operations will wear out everyone. Can get diurnal variation from the early morning flights and late night fluxes
    e. Possibly an earlier start period? (LAP bands are the best from 4am-6am.)
    f. Some arguments still for a possible night flight (12am-5am) (i.e., there was no real decision made)
    g. If there are clear areas upstream, they can do flux runs, possibly change VR, but it does take time to do that.
    h. Have to check with the Canada and US authorities about flight rules.
7) Flight Restrictions
    a. MOAs
    b. Nuclear sites (problem with the Oswego and Rochester ones)
    c. Can't fly long and short fetch patterns on same flight
8) Short-fetch (3 levels and includes the ferry)
    a. Wind from 290° pattern
        i. add more legs
    b. 310° pattern
        i. eastern version – saw pattern
        ii. western version
            1. very close to Toronto and the airport
            2. Or two longer legs with 3 levels
9) Down-wind persistence (3 flight levels)
    a. New flight pattern
        i. Needs to expand the FAA-approveed lidar box to the south and east.
        ii. Goal is one leg over the coastal plain, one north of the finger lakes and one south and possibly one in Pennsylvania.
        iii. Rich & George- New flight patterns
    b. Operational standpoint - want to do top down, but doing levels randomized may help get rid of the temporal issues.
10) Long-fetch
    a. 280°
        i. flux leg along the band

ii. lawnmower pattern along the wind
iii. along wind long pattern

b. Top to bottom is the safest approach
c. But the level may change depending on the day since it's more based on the isotherm levels (-15 & -10)
d. Soundings will be done in or near band; on edges of band best
e. Icing will be an issue. Lose instrument readings. Could take an hour to sublimate. The temp, dew point, and 3D winds are less susceptible than the microphysical probes.
    i. Add cross band legs because there will be less time in the icing zone.
    ii. Long band above, lawnmower next, and come back on the long level in the cloud last.
f. Lawnmower-maybe only 3 cross bands that are repeated 2 or 3 times.
g. A couple plans that sample bands near coast and evolving cases
h. Steps
    i. Flux bands (if needed)
    ii. Along wind above clouds
    iii. Lawnmower
    iv. Along wind in the cloud if icing isn't too bad

11) Safety
    a. Severe icing conditions-the ice builds up faster than it can be removed. (Very unusual)
    b. Droplet distribution is such that they don't freeze immediately. They roll back and freeze later. This is the more common depending on the clouds
    c. In cloud for a long time, on areas that are non-protected surfaces the ice is built up and the lift to drag ratio is dangerous.

Decision-Making—Who will make the final decision if there is a conflict??

1) Options:
    a. Steering Committee of a few main PIs from the each group
    b. Ops Director- decision of each PI for a few days decided well before the project
        i. Chance for people to be picked on?
2) Combination: Tie breaker to a steering committee?
    a. Could a steering committee take too long?
    b. Steering committee could work well with the group based on personality and no clear person who runs the whole show.
        i. 2 or 3 people on the steering committee with a chair that rotates?
        ii. Potential conflict if one group getting all the cases they really need and then another great case occurs
        iii. Base the chairperson on forecasts
        iv. 3 people: short fetch, long, and orographic
3) Need a detailed catalog of what has been obtained; this can be kept in the field catalog
    a. Meeting after the first half of the project (or once a week) to see what's been accomplished.
4) Decision
    a. Committee
        i. 3 people for a tie-breaker
        ii. Permanent people one from each group
    b. Meet each day to make decisions
        i. Could be a problem with meeting

c. Dave, Bart, and Karen are permanent members (substituting out as needed)
d. The committee will decide how to meet.
e. Look at the scorecard and make good decisions.

5) Splitting hours
    a. Flight hours are wheels up to wheels down plus 6 min
        i. Half for long fetch and short fetch
            1. Short fetch is further divided into north shore and south of L. Ontario
    b. Rawinsondes
        i. Very expensive
        ii. Keep track of soundings per site
        iii. Intense vs Less Intense periods
            1. If it runs through the night, they'll get tired; safety issues
        iv. Sonde launch is decided at forecast briefing
            1. Coordination from Canada and the US shore, both shores will launch
    c. DOW
        i. Can go out for every event
        ii. 15 hour days, but maybe long-lake a bit longer
        iii. But keep track of how many hours at each site.
    d. Very closely monitor Flight hours and rawinsondes; DOW less worrisome (Wurman);
        i. back to back cases are going to be complicated
    e. MIPS
        i. 12 IOPS at 24 hours
    f. MUPS

Operations Center

1) SUNY Oswego
    a. Eating area
    b. 2 Weather Decks (outside vs inside)
        i. Possible Rawinsonde launches
        ii. Good visual observations (SW to NE)
        iii. Inside looks north
    c. Meeting space-multiple areas
    d. Guest wireless access
    e. Visitor parking nearby (maybe a 10 min walk)-long-term parking passes
    f. Forecasting
        i. hiring 2-3 students to assist
        ii. tailored projects
            1. main model output is GARP
            2. everything will be provided to the online catalog
            3. BUFKIT
        iii. Possibly will be able to run the fire-weather with nested grid resolution of 1.3 km during the project. Jim Steenburgh is the contact for this; he is contacting person @ NCEP
        iv. Students start forecasting 1 November; access to all
        v. Weather service – can perhaps give us a update at 0z, 03z, 06 z; best to give us an update right after they issue their updates

2) Penn Yan Airport/Geneva
    a. Hobart has guest wireless
3) Communications between groups
4) Field catalog:
    a. Start the images in Nov to get things streamlined before the campaign starts
    b. Need to decide what will be in it.
    c. Work with EOL to get forecast needs set up.
    d. Forecast committee with subs if there is burnout.
    e. Ops center coordinator and the forecasters.
    f. Nowcasting (once every 3 hour update), get a lot of data into the discussions. Best time to update maybe 17Z?

Daily schedule (Main-morning flight)

1) Forecast & steering committee at noon
2) 1:15pm EST for forecast discussion
3) Decision by 2:30pm for dinner and a good night's sleep
4) Once IOP scheduled
    a. Need a nowcast team tentatively 2.5 hours prior to takeoff. (12Z)
    b. Flight plan needs to be done right after nowcast meeting
    c. Pre-flight meeting needs to be done right after that with just the people who will be on the flight and then powering instruments
        i. If delaying, need to know sooner.
        ii. Flight scientist won't be in the same place as forecasters

NWS involvement

1) Want to contribute at the 1pm briefings. Maybe one of the forecasters could offer some information (they'll decide who) 3-5 minute briefing of what the NWS is thinking about the upcoming event.
2) Would like to have somebody in Oswego occasionally during the course of the winter. Educational for them as well as useful for us.
3) Is there a way they could get some of the observations that are being taken in real time for validations?
4) Contact with Scott as the winter approaches.

Field Catalog

1) In-field tool to ingest and display operational and preliminary research products that can be used for evaluating too.
2) Includes
    a. Daily Mission Reports
    b. Operations Summary
    c. Facility Status Reports
    d. Data Analysis Products
    e. GIS-based display
    f. Preliminary Data sharing
    g. Web material Authoring tools
    h. Web based access
3) NSF likes this so they can watch what's going on remotely.
4) Main features

    a. Front page will be something for situational awareness
    b. Plan of the day
    c. Weather discussion
    d. Catalog Maps (real time situation tool, GIS)
    e. Chat Access with the airplane
    f. Also chat amongst groups as well
    g. Reports
    h. Operational products
    i. Model products
    j. Tools and Links for various groups
    k. Data Access if you want to share data during the campaign (preliminary data)
5) Ways to keep track of what instruments are working etc. (need a facilities coordinator??) Jeff would update for the King Air
    a. Great for post-analysis
6) Can have multiple reports per day
7) Chat rooms set up ahead of time will be saved.
    a. Also a private chat or the file will not be saved
    b. Can replay the conversation for a certain number of times
    c. All chat times are in Mountain Time.
8) How Low-bandwidth area to get the latest products?
9) Data format and ability to transmit data
    a. DOW
        i. Nested in the 88D image
    b. Sounding: email location or ftp it. (KML or ASCII format)
10) Photo Album to upload pictures too. Especially important for the ice crystal photos
11) Need a scorecard for tracking flight hours and sondes. (facility status area)
12) Take down prelim files once final is ready so no one is using the wrong data
13) Cosmic soundings?
14) Steps
    a. Prioritized list of operational and model products needed in the field
    b. List of research products that are expected to be uploaded from the field
    c. Special requirements for real-time support
15) Operational
    a. HRRR
    b. METAR data
    c. CoCoRaHS
    d. NCEP Models (chosen)
    e. tv affiliate radar data
    f. MADIS data
    g. Operational soundings
    h. Special Soundings
    i. GOES: VIS, IR, Water Vapor
    j. MODIS
    k. Buoys
    l. King City Radar
    m. Model output from Oswego
    n. WSR-88D from 3 sites and central PA
16) Jim will take the lead on making the list

17) Buoys
    a. Scott will contact Canada and US to see if the buoys can be kept out in Dec & Jan
18) Surface Precip
    a. Jim Steenburgh will work w/ Dave Zaff re sending a letter asking for additional obs from the various surface precip networks

Data Management

1) Station data
2) Radar data
3) Buoy data
4) Operational precipitation networks
5) Pages needed
    a. Data questionnaire in Google Drive
    b. Project web page
    c. Mail lists
    d. Long term archive
6) Data Policy
    a. Preliminary data submitted by July 31, 2014
    b. All prelim data is available to OWLeS Investigators upon request
    c. Operational data available without restriction-discussed removing this item
    d. Initial 1-year data analysis period, third parties can only get the data with permission of the investigators who collected the data
    e. Data will be considered public domain after January 31, 2015 (can be changed)
    f. Use of the data will include acknowledgement, co-authorship, etc., as appropriate
7) Composite datasets
    a. Popular
    b. Put information in a similar format and pass through the same QC.
    c. Could be useful for sounding and surface data especially
8) Publications
    a. Popular for program managers
    b. They do searches for pubs using search tools
    c. Strong request to submit own
9) Push to assign DOI's for datasets (looking into it)
    a. Allows for citing datasets
    b. Unclear how to police this to make sure metadata are complete and accurate.
10) Presentations from this workshop will be published online, password-protected.
11) Mailing list for all the OWLeS PIs
12) Papers must be password protected or through the AMS website – copyright issues.

Positions and Responsibilities

*See spreadsheet

1) A facilities manager on the steering committee
2) 16 hour shifts could be doable anything after that might be tricky
3) Public safety-contact police etc to let them know that the groups are out.
4) Satellite tracing device (spot and inreach)

Project Safety

1) winter survival course?
    a. CO poisoning
    b. Remoteness
    c. Temperature
2) Car gear
    a. Sleeping bags
    b. Gear
    c. Food
3) Orientation on Dec 3rd??
4) IOP process planning Dec 4th??
5) Jim Steenburgh will try to find a winter weather survival video
6) Will be brought up at each ops meeting
7) Individual facilities groups will have their own safety material

Outreach

1) Media Day on Dec 4 at Penn Yan
    a. King Air
    b. MIPS
    c. Sounding
    d. DOW
2) Cheryl Dyvas about this day; talk to press time about the best time of day
3) Try to get other students from nearby colleges to visit most likely during a down day
    a. Seminar series that goes out to a school to talk about one of them.
    b. Colleges want people to come to them.
4) Rural school district visits with DOW
5) Seminar series one credit private study course to target the students that are participating.
    a. On off days have the students listening to a talk about 1 hour
    b. Anyone could attend

Orientation

1) On Dec 3rd in Oswego at 10am. Full project personnel briefing
2) Snow crystal students work around Jim's group

Skeleton crew for the mother of all storms during Christmas week?
- No!

Additional Notes

Outreach:

Media Day at Penn Yan Airport: 4 December 2013

- **Penn Yan Airport Contact:**
  - Richard Leppert
    President
    Seneca Flight Operations
    A Seneca Foods Company
    2262 Airport Drive, Penn Yan, New York 14527-9590
    (315) 536-4471 v (315) 536-4558 f (585) 802-7963 m
    rleppert@senecafoods.com
- **NSF Contacts:**
  - Dr. Linnea Avallone, LAOF Program Director
    Phone: (703) 292-8521
    Email: lavallon@nsf.gov
  - Chungu Lu, PDM Program Director
    Phone: (703) 292-8524
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