

Action Items

IHOP_2002 Aircraft Coordination Meeting (5-6 Nov) and IHOP_2002 Workshop (November 7-9, 2001)

Science Issues:

- A better “marriage of components” is needed (CI and QPF) or else the project will fall far short of expectations and potential
- Links to other NASA projects
- AVIRIS – how does it fit in?

Funding Issues:

- Straw-plan on OFAP cuts (Parsons)
- NWS sondes and resource discussion with NCAR and UCAR (Parsons)
- Find more money for NWS soundings (Gaynor)
- Increase DC-8 hours (Arnold)

Issues resolved:

- Nelson decision on which proposals will be funded

Mobile Systems

- Define ABL requirements from Mobile Armada during joint CI/ABL missions (5 planned)
- Arrange for input to decision process from all mobile armada participants, not just FC.
- Determine if equipment exists for FC to coordinate all mobile ground-based systems.
- Define who will make the decision on which targets to pick, when to redeploy etc. (Norman Ops Center, mission scientist, FC etc.)
- Define real-time data needs:
 - at FC from Ops Center
 - on NRL P-3 by Aircraft mission scientist from Armada through FC
 - from FC to rest of the armada via Mobile Digital Network
- Address data format issues for mobile systems that use Freewave to transmit data to the FC.
- Agree on communications timetable, schedule, and frequency.
- Determine which mobile systems have VHF.
- Determine coordinated rendezvous stop for Mobile Armada outside of Norman, if needed
- Will MIPS, DOWS and mobile radiometer use Freewave? If not, what's the alternative?

Issues resolved:

- CI group defined the number of sondes needed for their missions within the context of the general OFAP allocation (420 GLASS, 115 CLASS)

- The mission scientist for the CI missions will be located in the FC, for other missions the mission scientist will be either in Norman or on the P-3.
- Decide on the location of the NSSL repeater: FC vehicle.
- Real-time data needs at Ops Center from Mobile Armada: FC will create SMART-R image with MM overlay and put on internet in real time.
- FC systems will be at SMART-R, FC, MM, S-Pol, UWKA and P-3.

Research Radar Operations

- Decide on final location of S-Pol
- Define S-Pol radar displays needed at Ops Center at various times.
- Define data products needed at S-Pol site (radar, satellite, forecasts etc).
- Define necessary coordination between S-Pol and the mobile radars.
- Distributed operations center with chain of command coming from S-Pol for aircraft microphysics studies.
- Define the list of IHOP radars.

Issues resolved:

- Write proposal for radar data display at Ops Center (done by RDP).
- Phone line at S-Pol (included in cost estimate).

Other Ground-based Systems

- Define location of ISFF “central station”.
- Find alternative for communications/data transfer via radio modems from ISFF towers to central station if flight tracks are too long.
- Define where FAA permits flights at 100 feet altitude; will determine location of ISFF locations.
- Determine usefulness of data from these systems back to Norman.
- Decide which comparison with airborne systems would be useful.
- Request/confirm that special NWS launches get onto GTS system in real-time.
- Decide on ARM launching frequency schedule.
- What is the NWS notification process for IHOP to request supplemental launches?

Aircraft Operations

Aircraft-Specific Issues:

- Get DLR Falcon into the country
- Finalize Falcon contract
- Is TCAS system a FAA requirement? Falcon doesn't have one.
- Obtain permission for one-time observers on P-3.
- Pay attention to lightning avoidance issues on King Air. Bring in lightning network into Ops Center and S-Pol?
- Second pilot for King Air.
- Finalize Learjet lease

- Arrange for air conditioning for P-3 on the ground.

Issues resolved:

- No second TDL can be provided to King Air. King Air will borrow Lyman Alpha from ATD/RAF as a second humidity instrument.

FAA and Military Issues:

- Determine where we are allowed to fly at low level (100 ft) in IHOP domain.
- Obtain altitude waiver and check into other FAA procedures.
- Feedback from Trevino about lidar and radar package for waiver

Flight tracks:

- Resolve issues related to real-time aircraft tracks information to the Ops Center. Potential ATD solution?
- Decide how much flexibility exists regarding flight tracks (Altitude, location, etc.)
- Davis to review ABL checkerboard pattern suggested by Wulfmeyer. Are the flights too long?

Dropsonde Issues:

- Decide how many dropsondes are needed for various missions.
- Coordinate frequency allocation for dropsondes and upsondes to prevent interference.
- Decide how far away from a boundary (perpendicular to the boundary) sondes will be dropped
- Work out spacing issues depending on parachute size and aircraft speed.

Aircraft Communications Issues:

- Identify correct, dedicated aircraft-to-aircraft VHF frequencies (NASA frequencies – Jennisen)

Issues resolved:

- King Air will not have Satcom system but use Freewave to transmit position and in situ data to the ground.
- P3 and King Air will have air-ground VHF-FM capabilities installed

Other:

- Look at aircraft flight hour efficiencies
- Decide on realistic distribution of flight hours for all components
- Decide on Learjet work separation; e.g., dropsondes from leased jet/ Falcon provides lidar operations only.

- Explore various airports as potential refueling stops for King Air and Falcon.

Issues resolved:

- Contacted US State Department reg. Falcon participation
- Contacted German Embassy reg. Falcon participation
- Contacted UCAR/Human Resources reg. temporary work visas for DLR staff.
- No TCAS system on Falcon in time for IHOP.
- Prepare list of one-time flyers/observers on P-3
- Arrange for NP4 Training for P3 Mission Scientists
- Flight track modifications:
 - Joint ABL-CI – P-3 will take off first (correct on slide);
 - Move P-3 to the northern part of region in moisture mapping flights since it is on station the longest;
 - LLJ multiple a/c: Falcon and Aeromet Learjet should start at the same time but go in opposite directions.
 - DC-8 to go first on Moisture Mapping
 - Change P-3 flight direction on late BL evolution flight track. Lidar needs to look to the right towards S-Pol.
 - Change DC-8 altitude to 25,000 feet for all flight tracks to operate LASE eyesafe.
- FAA Aircraft Tracking System limited in scope for IHOP purposes
- Identify “AWACS” airplane radio communications coordinators for P-3 for air-to-air communications: NRL personnel.

Instrument Intercomparisons

- Get validation table on web site
- Conduct pre-project intercomparison between C-130, King Air and P-3 and between air and ground systems (includes gust probe comparison between King Air and P-3)
- Develop flight plan for intercomparison flight legs either at the beginning of a mission during ferries or during dedicated intercomparison flights (about 2 hours) during the project
- PIs to check if instrument location and operational period can meet the objectives for planned intercomparisons.
- Decide on how many hours and dropsondes will be allocated for intercomparison flights.
- Decide on who will oversee the intercomparison.
- Establish data formats for intercomparison data sets.
- Define analysis responsibilities.
- Publish intercomparison datasets (ground systems versus airborne) before project for analysis.
- Provide input for Ops Plan Summary.

- What supplemental data are needed to expand the capability of a particular instrument?
- Do we want to center a cluster of instruments outside the CART site?
- Publish instrument performance characteristics
- Define what data from intercomparisons are needed for models
- Include all PIs in instrumentation mailing list

Forecasting Support

- Define forecasting products needed by each of the components.
- Define forecasting domain (same as IHOP domain?)
- Request/finalize HPC involvement:
 - Which products do we need?
 - Personnel
 - What does HPC need in terms of real-time data from IHOP?
 - How do we get the information to the HPC?
- Define NESDIS involvement.
- Which information will go into the IHOP data base/briefing (few products versus broader range)?
- Define which cloudiness product could be made available for QPF.
- Define how forecasts will impact IHOP mission priority.
- Further define mission selection process and details

Issues resolved:

- Expand nowcasting to some amount of forecasting in the afternoon.
- Combine time line of daily project activities and forecasting activities.
- IHOP will not attempt back-to-back day and night missions for Day1

Modeling

- Include other real-time efforts (NASA/Marshall, 5 km U Wisc) but not post-experimental modeling efforts

Data Ingest and Management

- Define "IHOP domain"
- Real-Time Products vs. Archive Data: Decide which data are needed and which ones are needed in real-time. There is a cost involved (50 cents/phone call).
- Determine all data/product sources (NCAR, NESDIS, SAA, NASA, Internet, etc.)
- Set up ftp account with OK Mesonet to get special data to individual PIs for modeling effort.
- Define WSR-88D NIDS products requirement for archive (individual sites and national composite).

- Arrange for ingestion of soundings into the GTS from Ops Center
- Create distributed data access.
- Create Distributed Archive
- Decide if any data restrictions are desired
- Include model output web links on Data Management Page (Koch, Williams)
- Modifications to data questionnaire:
 - include sub-box for those categories where no real-time are available anyway.
 - include skin temperature availability from the 100 sites of OK Mesonet sites.
- Get responses to questionnaire from PIs.

Issues resolved:

- Link to IHOP Data Management page of JOSS (www.joss.ucar.edu/ihop)
- Prepare Data Questionnaire
- CRAFT level II data will be composited and then displayed at the Ops Center.

Communications:

- Define who is going to put in all the radios and set up the system. Pieces need to be put together. Set priorities, rapidly.
- How do you arrange for timing of voice and data transmission without interference?
- Find radio equipment for S-Pol site. May require a tower.
- How do we coordinate with MIPS, MGLASS and S-POL: cell phones?
- Check on cell phone coverage in the area. At least in the crucial areas like Lamont they need to be working.
- Need scientist/scientist communication from P-3 to Falcon and from P-3 to Learjet.

Issues resolved:

- Aircraft that allow scientist/scientist communication: DC-8, P-3. Put FC near S-Pol when not used for CI missions.
- Freewave available at S-Pol, on King Air and P-3.

Operational Support Issues:

- Determine timing of aircraft mission briefings, morning weather briefing, daily planning meeting etc.
- Define "Project IOP"
- What PI representation is required at daily planning meetings?

Issues resolved:

- Modifications to planning/operations schedule
 - Daylight versus standard time
 - Terminology: pre-mission briefing versus pre-flight briefing.

Operations Center

- Finalize arrangements with NWS for analysis center.
- Finalize arrangements at Will Rogers for space and communications

Other IHOP Project Office:

- Create shipping, logistics bulletins
- Post and distribute updated instrument funding list
- Finalize logo
- Conduct extensive IHOP PR to inform public
- Determine date for next IHOP meeting in Spring 2002
- Ops Plan: get round two by 15 February

Issues resolved:

- Post OFAP comments on the web

Personnel

- Define forecasting personnel needs for weekends, target when professional volunteers may be needed. Do we need assistant nowcasters?
- Define what the forecasting roles are before advertising to the NWS for nowcasting. How many are needed? What kind of staffing? Involve the central region as well.
- Contact local Science Operations Officers in local NWS forecasting offices to see whether they want to volunteer.
- Advertise for “volunteers”.
- Check with NSF reg. REUs and student involvement
- REU exploration with other universities
- Project Office will need to coordinate visiting students, scientists etc if they want to help with nowcasting, operations etc
- Define all position for all instruments