1998O823I1 - LPS

E.2 Lead Project Scientist (On-Board)

E.2.1 Preflight

___✓___ 1. Participate in general mission briefing.

___✓___ 2. Determine specific mission and flight requirements for assigned aircraft.

___✓___ 3. Determine from CARCAH or field program director whether aircraft has operational fix responsibility and discuss with AOC flight director/meteorologist and CARCAH unless briefed otherwise by field program director.

___✓___ 4. Contact HRD members of crew to:

a. Assure availability for mission.
b. Arrange ground transportation schedule when deployed.
c. Determine equipment status.

___✓___ 5. Meet with AOC flight crew at least 90 minutes before takeoff, provide copies of flight requirements, and provide a formal briefing for the flight director, navigator, and pilots.

___✓___ 6. Report status of aircraft, systems, necessary on-board supplies and crews to appropriate HRD operations center (MGOC in Miami or FGOC at remote recovery location).

E.2.2 In-Flight

___✓___ 1. Confirm from AOC flight director that satellite data link is operative (information).

___✓___ 2. Confirm camera mode of operation.

___✓___ 3. Confirm data recording rate.

___✓___ 4. Complete Form E-2.

E.2.3 Postflight

_____ 1. Debrief scientific crew.

_____ 2. Report landing time, aircraft, crew, and mission status along with supplies (tapes, *etc.*) remaining aboard the aircraft to the appropriate HRD operations center (MGOC or FGOC).

_____ 3. Gather completed forms for mission and turn in at the appropriate operations center. [Note: all data removed from the aircraft by HRD personnel should be cleared with the AOC flight director.]

_____ 4. Obtain a copy of the 10-s flight listing from the AOC flight director. Turn in with completed forms.

_____ 5. Determine next mission status, if any, and brief crews as necessary.

_____ 6. Notify the appropriate operations center (FGOC or MGOC) as to where you can be contacted and arrange for any further coordination required.

_____ 7. Prepare written mission summary.

On-Board Lead Project Scientist Check List

Date 980823 Aircraft N43RF Flight ID 980823I

A. Participants:

HRD		AOC	
Function	Participant	Function	Participant
Lead Project Scientist	Aberson / Gamache	Flight Director	Parrish
Cloud Physics	Itself	Pilots	McKim, Tennesen, Kendl
Radar	Gamache	Navigator	Kozak
Workstation	Dodge	Systems Engineer	Roles
Photographer	x	Data Technician	Lynch
Omegasonde	Dodge/Gamache/Aberson	Electronics Technician	
AXBT/AXCP	X	Other AVAPS	Smith

Take-Off: Location: Bermuda Landing: Location: Tampa

B. Past and Forecast Storm Locations:

Date/Time	Latitude	Longitude	MSLP	Maximum Wind

C. Mission Briefing:

D. **Equipment Status**

Equipment	Pre-Flight	In-Flight	Post-Flight
Aircraft			
Radar/LF			
Radar/TA (Doppler)			
Cloud Physics			
Data System			
Omegasondes			
AXBT/AXCP			
Workstation			
Photography			

REMARKS:

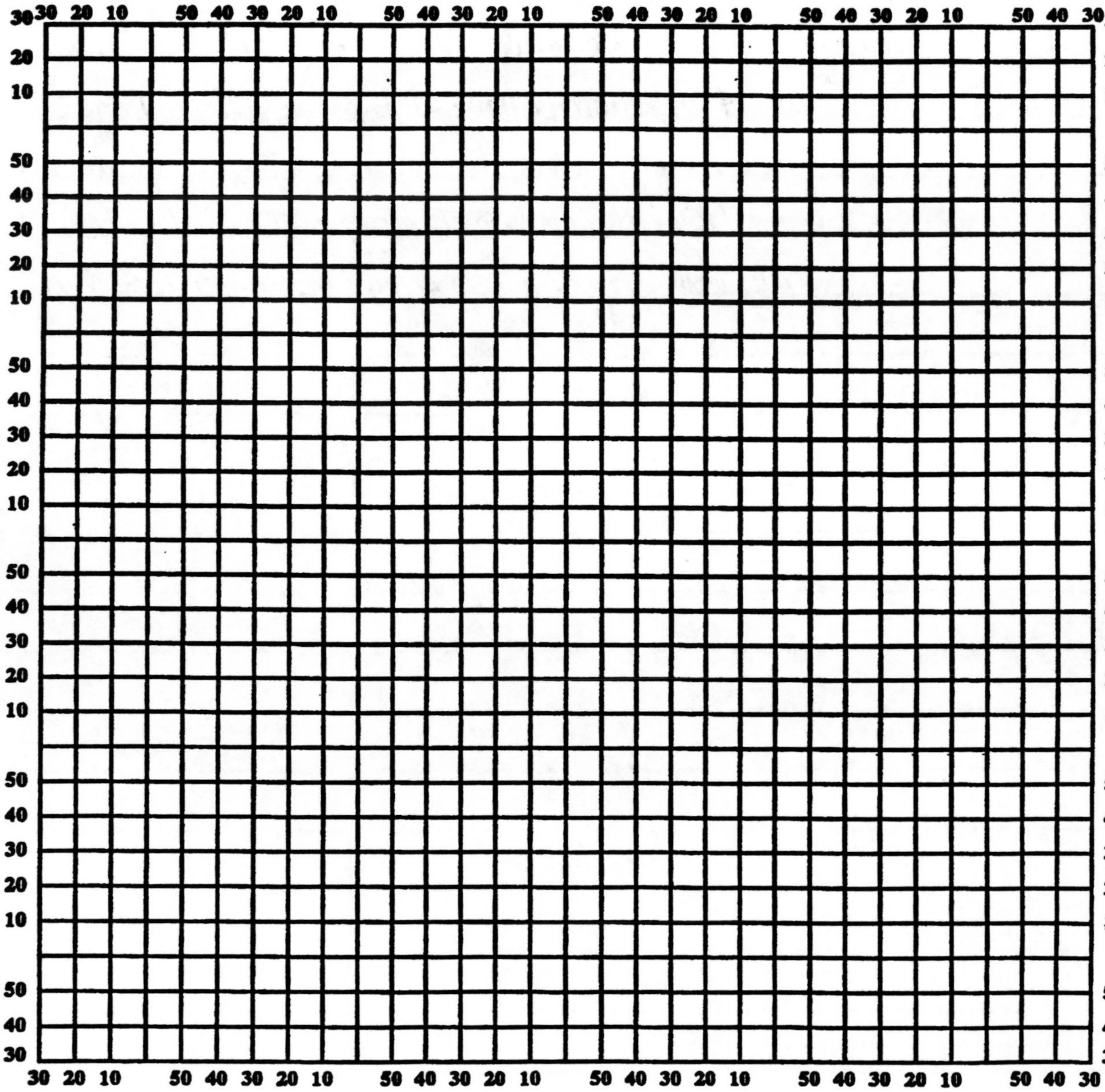
E. (I) **Proposed Flight Pattern** (sketch or designate by number)

E. (II) **Actual Flight Pattern**

Hurricane Recco Plotting Chart

True at 25° Latitude, in Degrees and Minutes

Date ______________ Aircraft ______________ Observer ______________



Note: Label full degrees according to location of flight area.

Lead Project Scientist Event Log

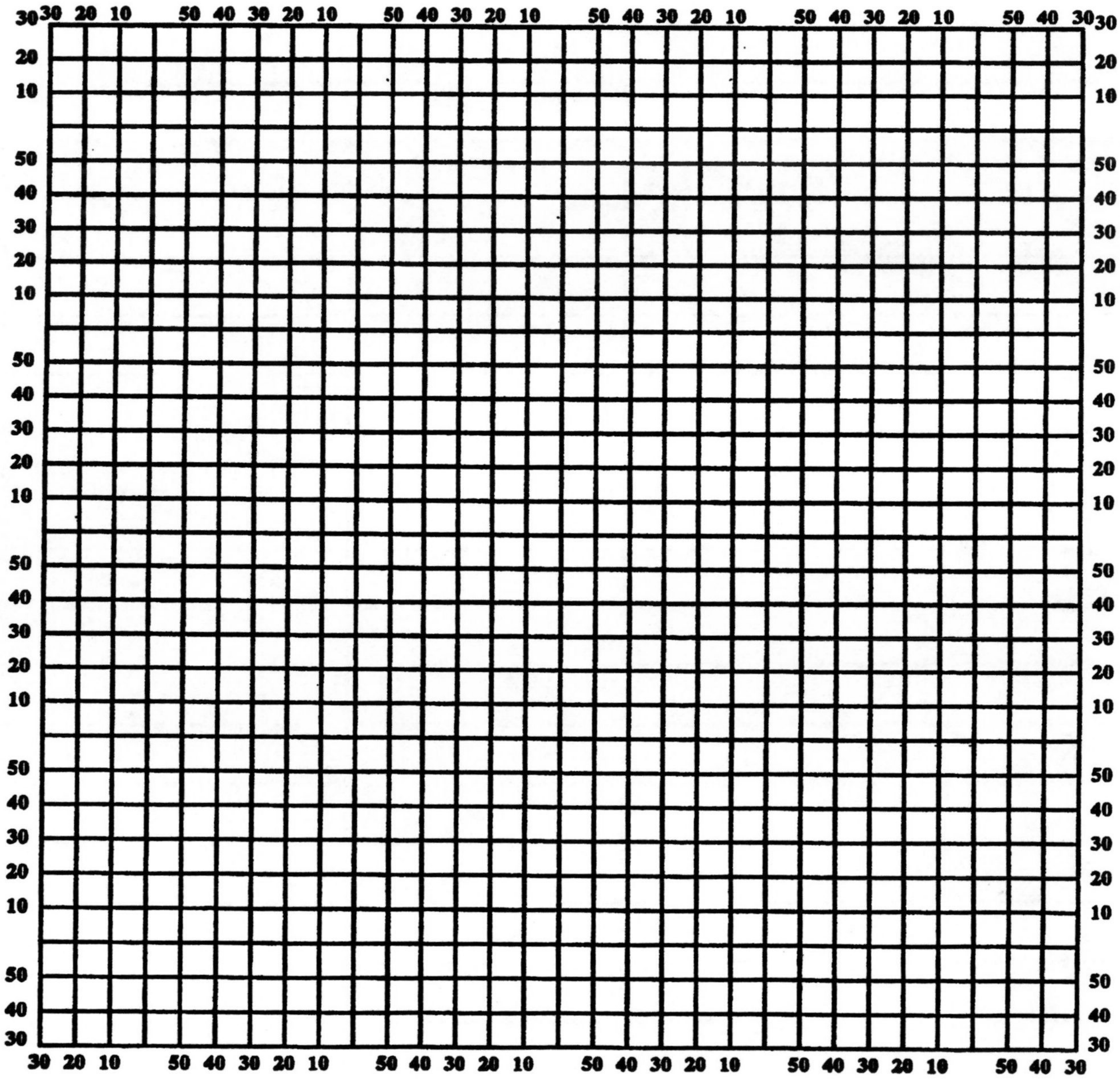
Date 980823 **Flight** 980823I **LPS** Akerson / Gamache

Time	Event	Position	Comments
17:32	Takeoff	Bermuda	Success! Flight track
	has 25 dropsondes, we have 26 on board, 2 with T offset,		
	2 with p offset. I decided to use 2 with T offset at beginning		
	since TR are less important for synoptic sondes. Two		
	sondes with p-offset not to be used, no sondes backed up.		
18:25	Two sondes checked before failed to initialize. Removed one		
	drop in northern eyewall, no backups on rest		
19:23	Some ice on cloud physics. Checked for P-static for next sonde. Everything		
	clear. Bonnie visible on radar		
19:50	Five more bad sondes found. Decided to not drop #4, #5 because		
	surrounding sondes can get information		
20:08	Cloud physics parity error. Rebooted		
20:15	Made three past-Bonnie sondes, too. Only eyewall drops are to be E & N		
	in inner edge. Zero sondes will remain, so no backup		

Hurricane Recco Plotting Chart

True at 25° Latitude, in Degrees and Minutes

Date ______________ Aircraft ______________ Observer ______________



Note: Label full degrees according to location of flight area.

Lead Project Scientist Event Log

Date ____________________ Flight ____________________ LPS ____________________

Time	Event	Position	Comments

Lead Project Scientist Event Log

Date ____________________ Flight ____________________ LPS ____________________

Time	Event	Position	Comments

Lead Project Scientist Event Log

Date ____________________ Flight ____________________ LPS ____________________

Time	Event	Position	Comments

Mission Summary
Bonnie
980823i Aircraft 43RF

Scientific Crew

Lead Project Scientist:	Sim Aberson
Radar Scientists:	John Gamache and Peter Dodge
Dropwindsonde Scientists:	Sim Aberson, John Gamache, and Peter Dodge
Workstation Scientist:	Peter Dodge

Mission Briefing:

Hurricane Bonnie on the verge of becoming a major hurricane just to the east of the central Bahama Islands, almost stationary at takeoff (Fig. 1). A very weak ridge to the north separates Bonnie from the strong westerly winds in the jet stream, and the forecast models have an uncertainty whether the hurricane will make landfall in the Carolinas or remain offshore. Further, a disturbance approaching the Windward Islands threatens to becoming a tropical depression, presenting a second forecast problem.

Ensemble perturbations (Fig. 2) suggest that the main areas of uncertainty in this forecast coincide with Bonnie itself. This includes the outer edges of the very large wind field, and also includes the strength of the weak ridge to the northeast of the storm center. Another area of uncertainty coincides with the upper cold low over Georgia, which could steer the storm further to the north. Targeting figures from the ensemble transform technique made by Sharan Majumdar using both the UV and the TRACK norms (Figs. 3 and 4) confirm that the uncertainty is mainly local.

A hybrid three-plane synoptic flow/inner-core mission (Fig. 5) was therefore called, with NOAA43 flying a pattern from Bermuda southward and eastward to take some observations for the disturbance, entering Bonnie from the south to do a figure 4 in the core, to recover in Tampa.

Mission synopsis:

Twenty-six dropwindsondes were available, and the flight pattern called for 25 drops. However, two sondes had a large pressure differential, and were not used. A further five sondes did not transmit data to the AVAPS system, and also were not used. No major changes were made to the flight plan, though drops were spaced more sparsely, and four of the six planned eyewall drops were not done.

Otherwise, dropwindsondes were mainly successful. Upon turning northwestward back toward Bonnie, we suddenly encountered northwesterly winds in a thin cloud layer. Ice crystals were evident on the cloud physics monitor, and it seemed that we were in the outflow layer of either Bonnie or some of the outer thunderstorms associated with the storm, about 750 km east of the center. The dropwindsonde that would have confirmed this was a fast faller and never got wind measurements. However, upon leaving the cloud at the same height, winds subsequently quickly changed to an eastward component where they remained, with the thin layer of clouds just above us. The next dropwindsonde had good winds, but they failed about halfway down to the sea surface.

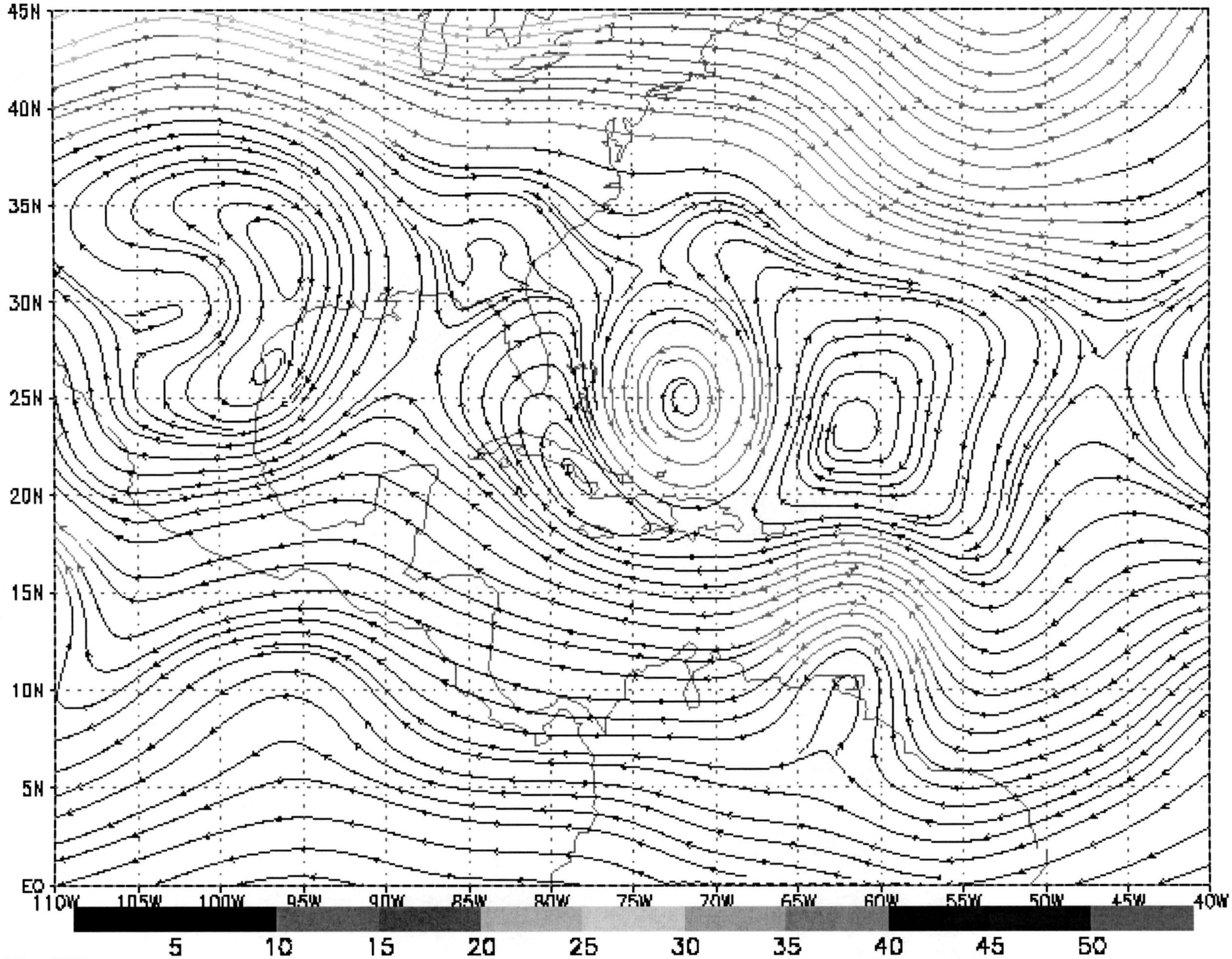
We then descended below the freezing level to reduce p-static in the central soundings. The four soundings 40 nmi out from the center showed remarkable symmetry given the strong asymmetry in the convection. The southern and eastern dropwindsondes had 91 kt mean boundary layer winds, and the northern dropwindsonde had 93 kt. The western dropwindsonde showed slightly weaker winds. The strongest winds were in the northern dropwindsonde, with winds approaching 120 kt at 850 mb.

The convection was mainly on the eastern and northern sides with strongest bumps in the eastern approach. Eyewall passage was much smoother. Three other dropwindsondes were deployed, one in the eye (960 hPa), and one each in the inner edge of the eastern and northern eyewalls. The dropwindsonde in the eastern eyewall failed. The northern eyewall was difficult to find, since it appeared that an eyewall cycle was occurring. A protuberance could be seen in the reflectivity extending southward into the eye. When we flew into this feature, winds were westerly, though they may have been northerly further down. The northern eyewall dropwindsonde was deployed further to the north along this feature, and showed winds barely of hurricane force, perhaps a collapsing eyewall.

All dropwindsondes were sent through ASDL. A radar composite was also sent through ASDL. The EVTDs did not look good enough to send.

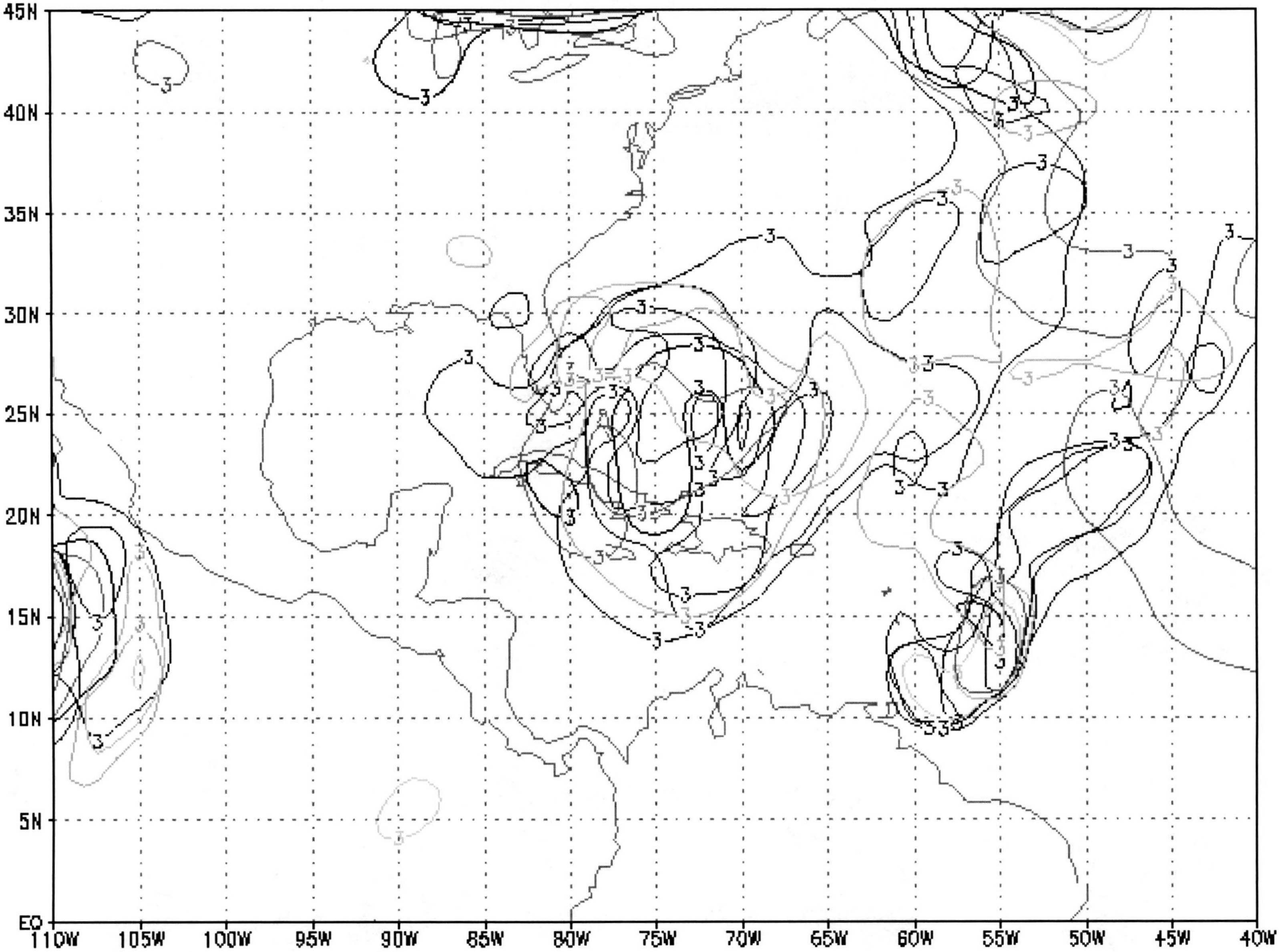
Sim Aberson
9 September 1998

DLM wind 98082400 00h T126



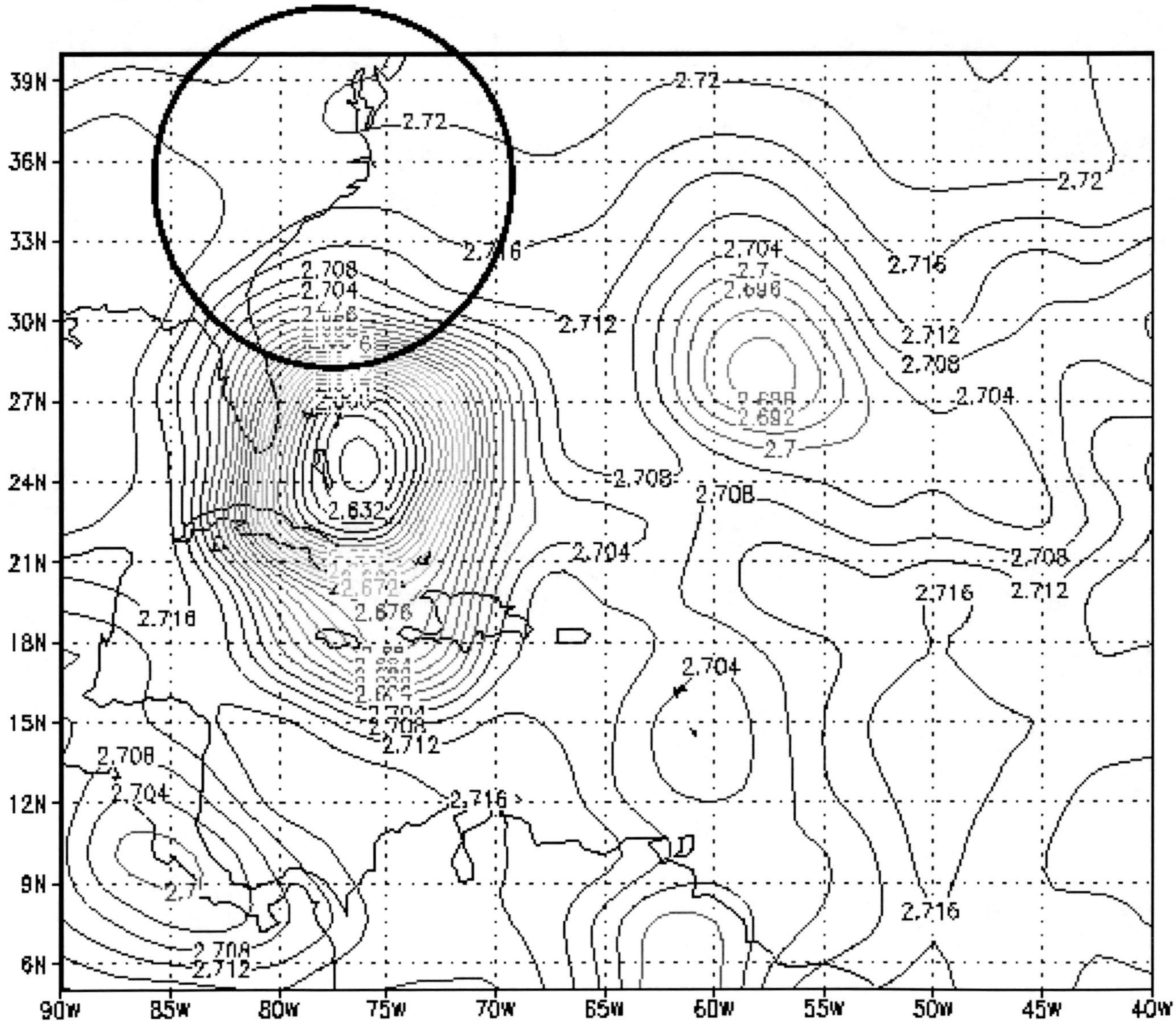
GrADS: COLA/IGES

DLM wind 98082300 24h



GrADS: COLA/IGES

Hurricane Bonnie. Prediction error variance as a function of target regic
location based on the 98082300 NCEP ensemble of 14 members.
Targeting time +24h. Verification time +72h. ALPHA. TRACK Norm.



Hurricane Bonnie. Prediction error variance as a function of target regic
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