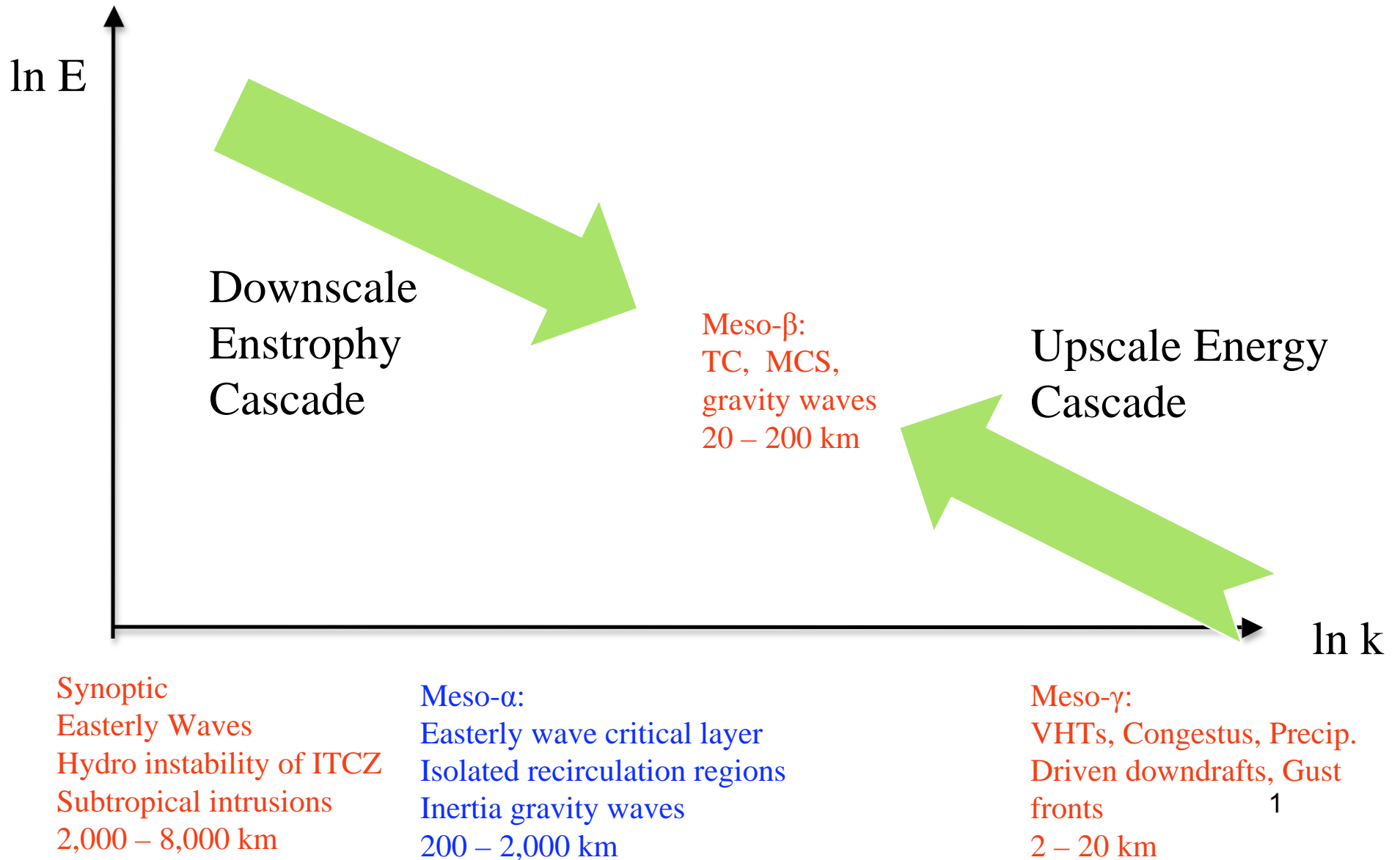


Consideration of horizontal scales exposes the challenging nature of the problem



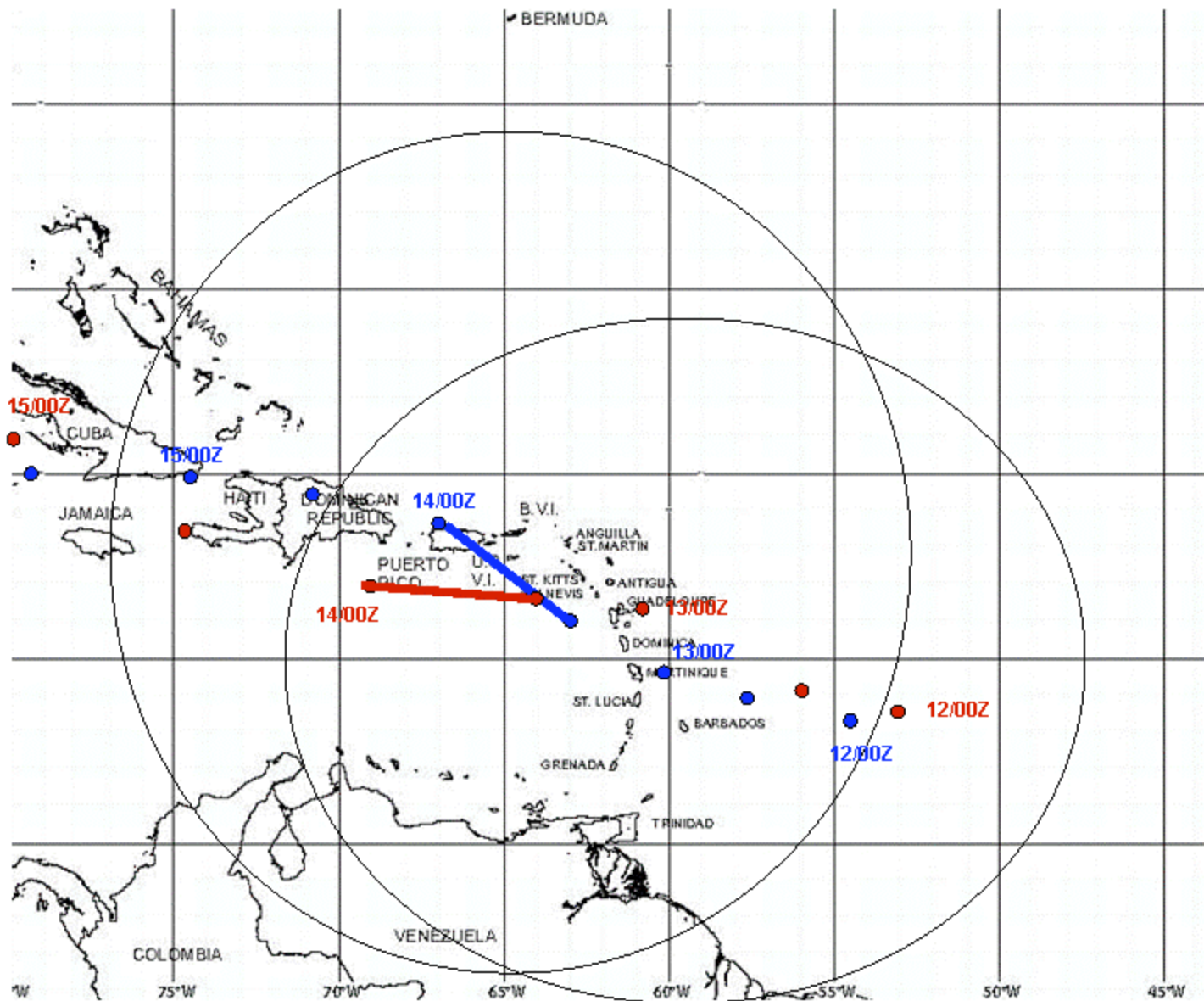
Wave-Pouch Tracking Methodology

- Front page imagery
 - Methodology for determining initial position
- Phase speed determination
 - Zonal method (RH & v)
 - Oblique method
- Track creation
 - Methodology for determining level
- Meso- α diagnostics
 - Zeta, OW, RH, Vertical Shear
- Satellite/analysis (over to LeeJoice)

PG10L FORECAST

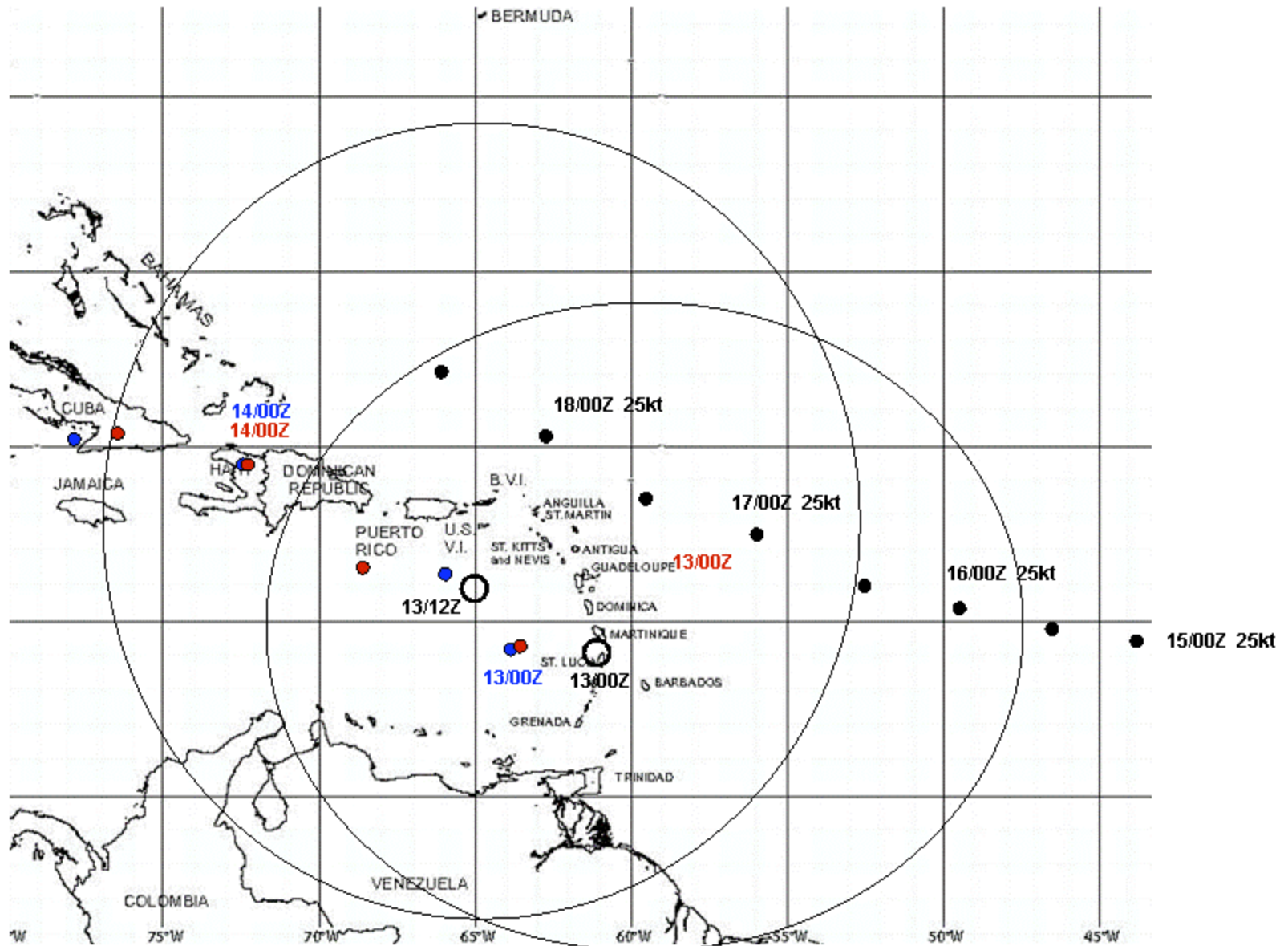
NOGAPS

UKMET



PG10L FORECAST
Aug 13/00Z NOGAPS
Aug 13/00Z UKMET

TD02L FORECAST
OFFICIAL



2009 GRIP / PREDICT Dry Run Summary

	Nondevelopers			Developers		Wave-ITCZ Interaction		Diabatically activated?	SAL / mid-level dry air: Killed or Survived?	
	No pouch	Shallow pouch above PBL	Shallow pouch within PBL	Deep pouch	Shallow pouch	Deep pouch	Intensified on ITCZ			Excited new waves
97L										
PG01L			X				No	No	No	NA
PG02L										Maybe. SAL to east
PG03L							X			Maybe. In SAL
PG04L							X			Maybe. In SAL
PG05L							X			
PG06L							X			Maybe. In SAL

2009 GRIP / PREDICT Dry Run Summary

	Nondevelopers			Developers		Wave-ITCZ Interaction		Diabatically activated?	SAL / mid-level dry air: Killed or Survived?
	No pouch	Shallow pouch above PBL	Shallow pouch within PBL	Deep pouch	Shallow pouch	Deep pouch	Intensified on ITCZ		
PG14L									
PG15L			X						
PG16L									
PG17L Danny									
PG18L									
PG19L									
PG20L Erika							X		

2009 GRIP / PREDICT Dry Run Summary

	Nondevelopers			Developers		Wave-ITCZ Interaction		Diabatically activated?	SAL / mid-level dry air: Killed or Survived?
	No pouch	Shallow pouch above PBL	Shallow pouch within PBL	Deep pouch	Shallow pouch	Deep pouch	Intensified on ITCZ		
PG15L			X						
PG12L Bill							X		
PG20L Erika								X	
PG25L Fred									X
PG24L				X Shear					
PG26L				X					Killed

2009 GRIP / PREDICT Dry Run Summary

	Did not develop			Developed	Wave-ITCZ Interaction		SAL / mid-level dry air	
	No pouch	Weak pouch	Deep pouch	Deep pouch	Intensified on ITCZ	Excited new waves	Killed	Survived
PG06L					X		Maybe. In SAL	
PG07L								
PG08L					X			
PG09L *sheared by PG08L								
PG10L Claudette				X				
PG11L Ana				X				

2009 GRIP / PREDICT Dry Run Summary

	Did not develop			Developed	Wave-ITCZ Interaction		SAL / mid-level dry air	
	No pouch	Weak pouch	Deep pouch	Deep pouch	Intensified on ITCZ	Excited new waves	Killed	Survived
PG12L Bill				X	X			
PG13L *Sheared by PG12L								
PG14L *Never left Africa								
PG15L *In Bill's wake		X		X (Eventually, as Jimena in Eastpac)				
PG16L *Barbados surprise								
PG17L Danny (Shear from ULL)				X				

2009 GRIP / PREDICT Dry Run Summary

	Did not develop			Developed	Wave-ITCZ Interaction		SAL / mid-level dry air	
	No pouch	Weak pouch	Deep pouch	Deep pouch	Intensified on ITCZ	Excited new waves	Killed	Survived
PG24L 95L, E.Atl northward			X					
PG25L Fred, E.Atl northward				X				
PG26L 98L, C.Atl fizzle			X				X	
PG27L Northward Africa coast fizzle								
PG28L C. Atl fizzle								
PG29L TD08L, E.Atl northward				X				X

2009 GRIP / PREDICT Dry Run Summary

	Did not develop			Developed	Wave-ITCZ Interaction		SAL / mid-level dry air	
	No pouch	Weak pouch	Deep pouch	Deep pouch	Intensified on ITCZ	Excited new waves	Killed	Survived
PG30L Models liked it over Leewards								
PG31L					X			
PG32L Henri				X				
PG33L 92L, joined Henri's wave?					X			

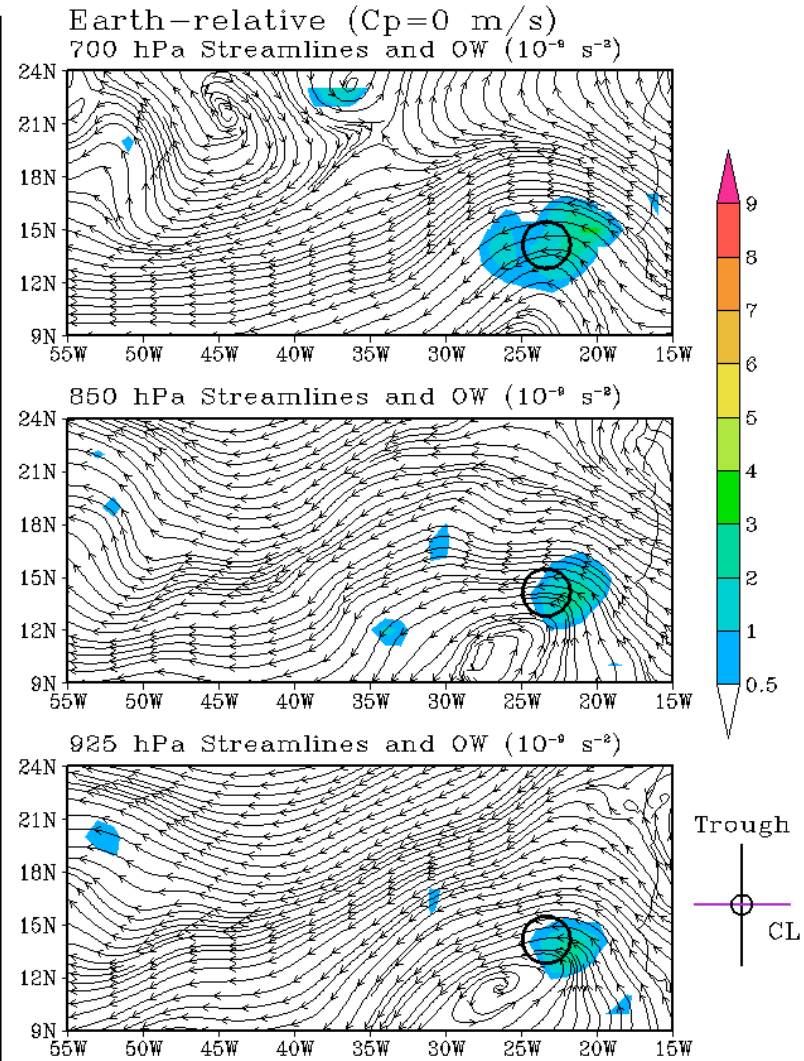
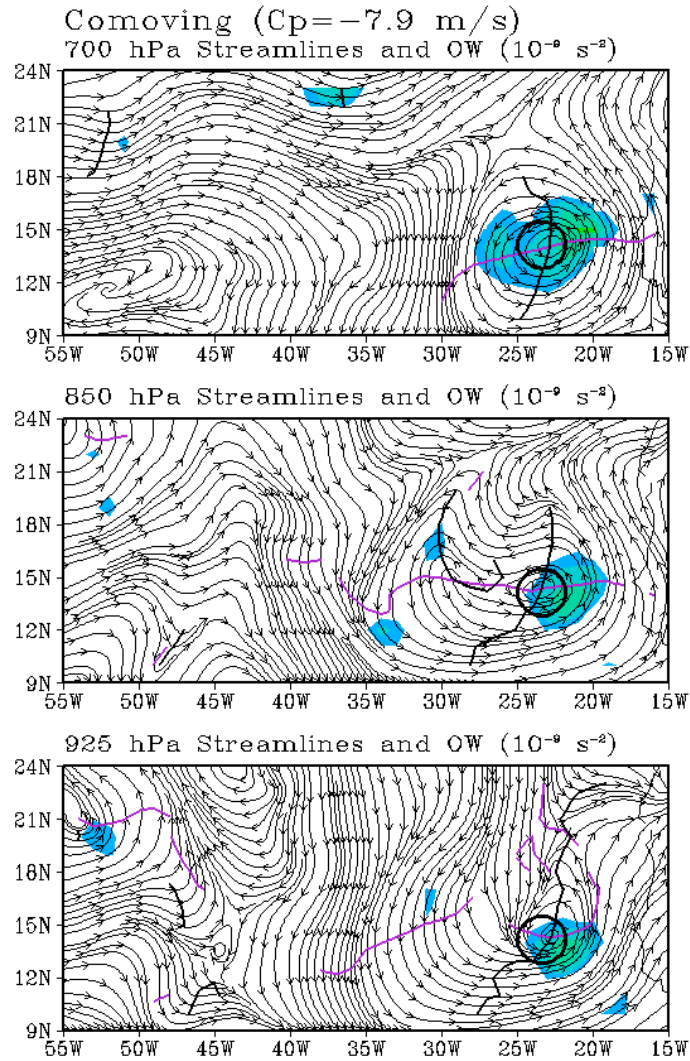
Examples (Use website)

- Intense (clear-cut)
 - Bill
- Weak (not as easy)
 - Danny
 - PG10L (pre-Claudette)
 - Unique regeneration
 - PG25L (Fred)
 - Models killed, killed, killed ... it lived, lived, lived
 - PG29L Sept 24/00
 - Models killed it, but ...
 - Survived (in midst of SAL) and became TD08L

PG29L/TD08L

24/00 Analysis

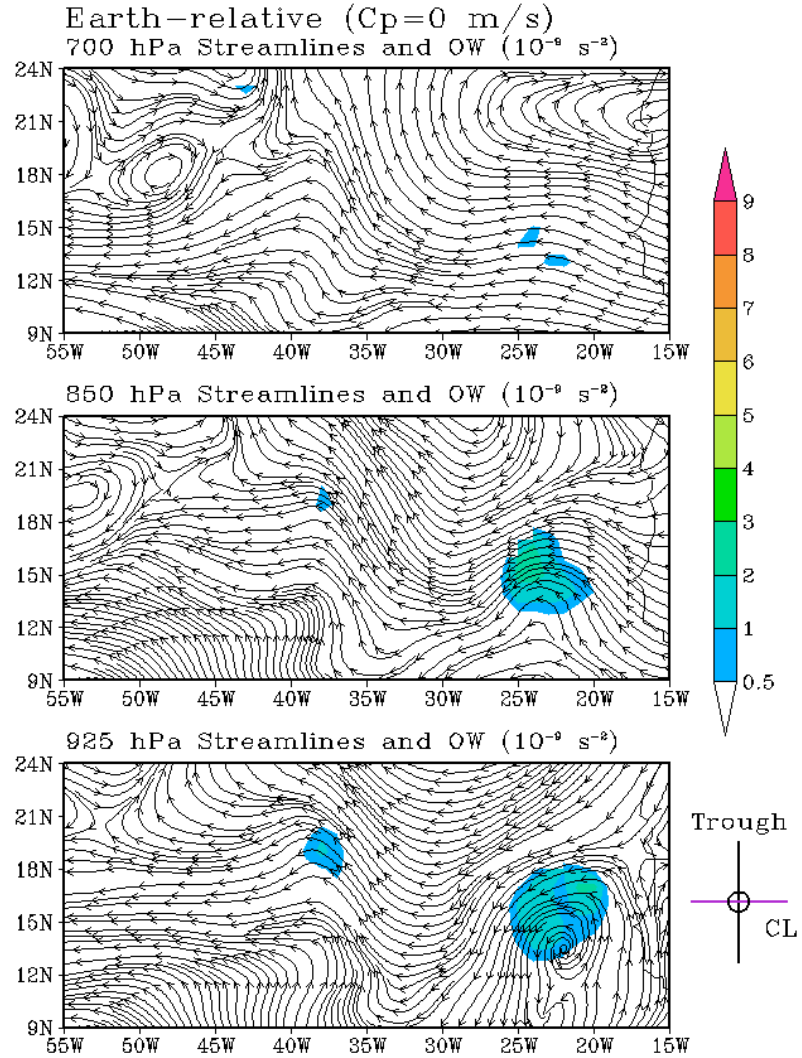
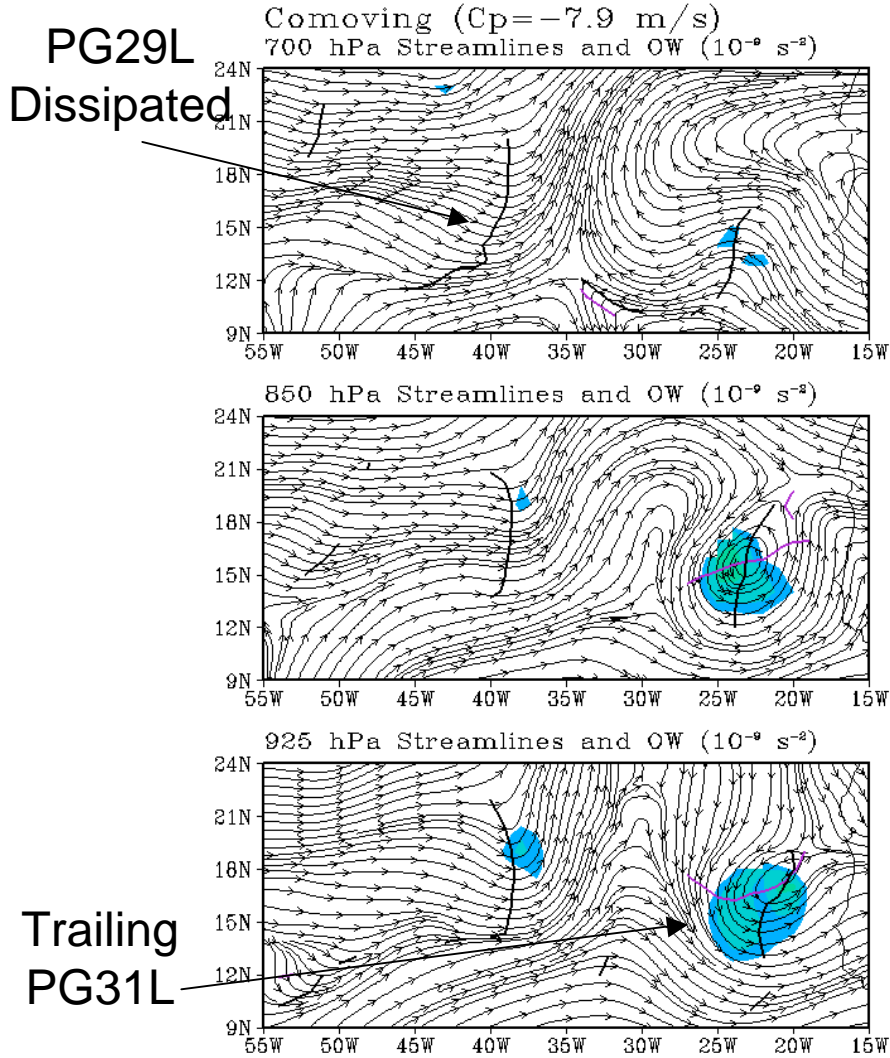
PG29L: 2009092400 (0h UKMET valid at 00Z24SEP2009)



PG29L/TD08L

24/00 72h Forecast

PG29L: 2009092400 (72h UKMET valid at 00Z27SEP2009)



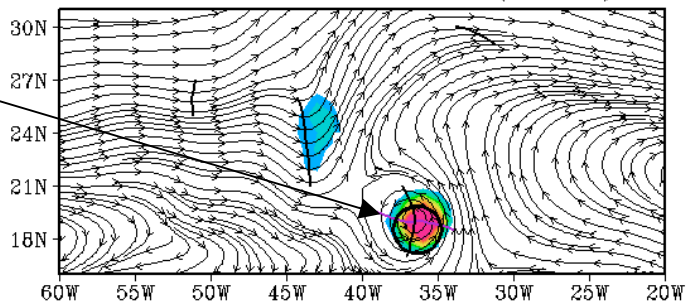
PG29L/TD08L: 27/00 Verifying Analysis

PG29L
definitely
not
dissipated

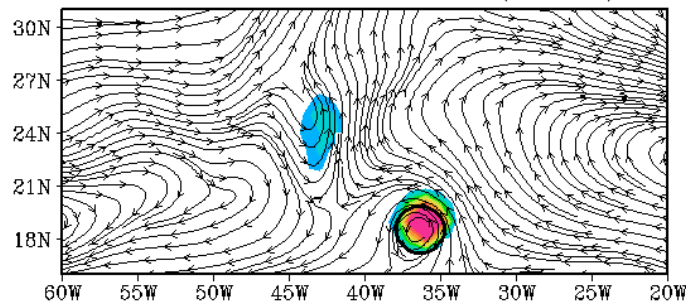
MISS

PG29L: 2009092700 (0h UKMET valid at 00Z27SEP2009)

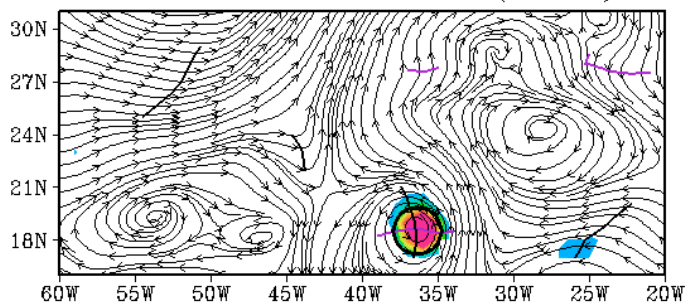
Comoving ($C_p = -3.7$ m/s)
700 hPa Streamlines and OW (10^{-9} s^{-2})



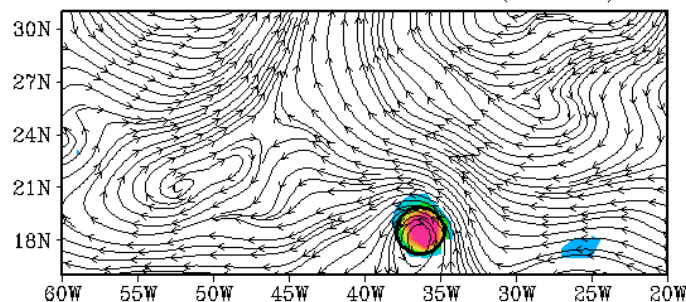
Earth-relative ($C_p = 0$ m/s)
700 hPa Streamlines and OW (10^{-9} s^{-2})



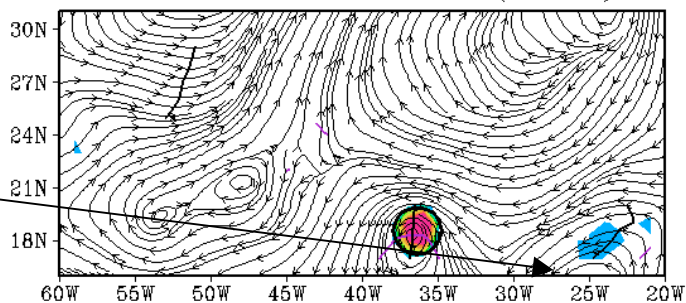
850 hPa Streamlines and OW (10^{-9} s^{-2})



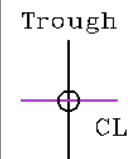
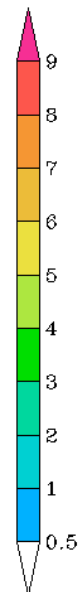
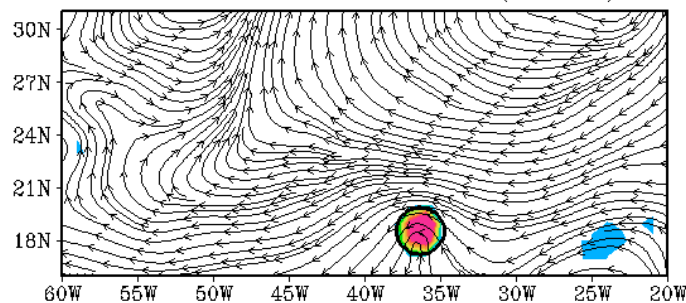
850 hPa Streamlines and OW (10^{-9} s^{-2})



925 hPa Streamlines and OW (10^{-9} s^{-2})



925 hPa Streamlines and OW (10^{-9} s^{-2})



PG31L
Weak
FALSE
ALARM

Plans for 2009 Test Cases

- Get flight data from 2009 cases
- Test $OW = 2 \times 10^{-9} \text{ s}^{-2}$ formation threshold

Still Need to Understand

- Role of wave's phase speed on formation

New Diagnostics Wish List

- ‘Diabatic Activation’ (i.e., persistent convective activity). Use visible/infrared/microwave satellite imagery
- Warm & dry air from middle level tropical atmosphere or African continent (SAL products, real time ? ...)
- Trade wind inversion (real time)
- CAPE (real time)
- CIN (real time)