





Case Study 2

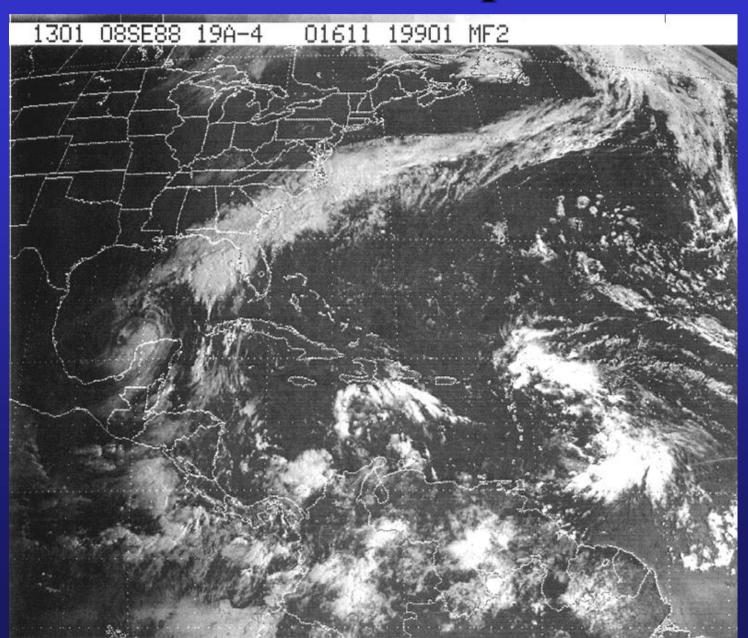
JACK BEVEN
NATIONAL HURRICANE
CENTER

WHERE AMERICA'S CLIMATE AND WEATHER SERVICES BEGIN

Objective

- To perform Dvorak intensity analyses on the complete life cycle of a tropical cyclone
- Note: The answers you get may differ somewhat from the solutions on the case study. This represents some of the normal subjectivity and uncertainty associated with the Dvorak technique.

1301 UTC 8 Sep 1988

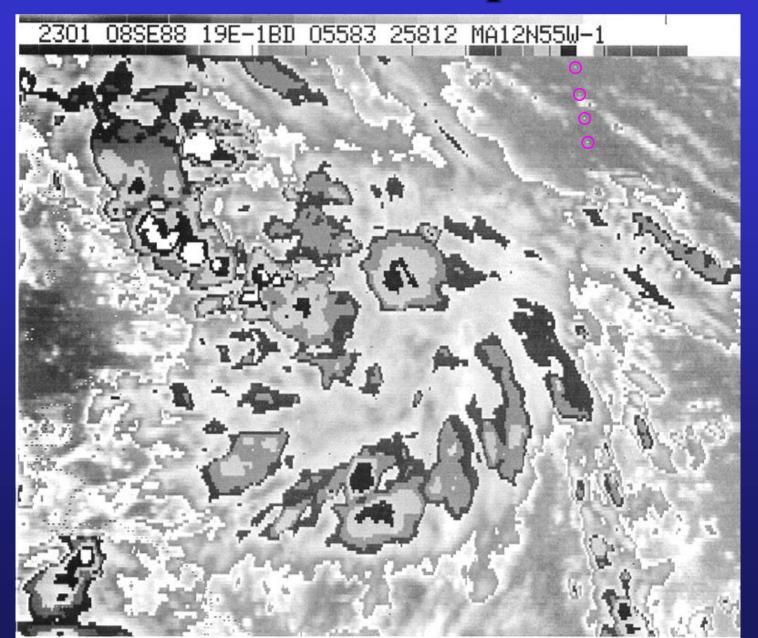


Issues for 1301 UTC 8 Sep 1988

- This is the first classification assume the system is developing and the MET=1.0
- What cloud pattern does it have?
- Is the DT representative of the true strength of the system?
- What are the constraints on the first classification?

Vernon F. Dvorak May 1982		Т	FOF	MBE	R ES	TIM/	ATE MBE	FRO R (D	M M T) C	EASI OMF	UREN UTA	MENT MOIT	rs V			T-N	UMB A	ER E	ESTII DT C	MATE	E FR	OM	MODI 3.	EL
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2301 UTC 8 Sep 1988

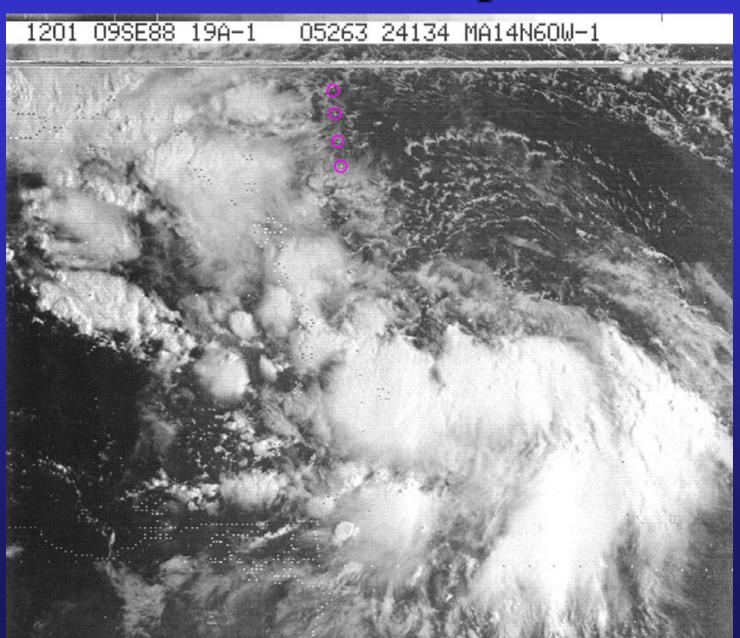


Issues for 2301 UTC 8 Sep 1988

- Assume the system is developing and the MET=1.5
- What cloud pattern does it have and can it be measured?
- If no DT number can be determined, what do you do?

Vernon F. Dvorak May 1982		7			R ES	TIMA	ATE	FRO	мм	EAS	UREN	MEN ³	rs			T-N	UMB A	ER E	ESTII DT C	MATE	E FR	OM I	MODI	EL
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DESCRIPTION	Loc	ation	Curve	ed Ban	d or f	Shear	Εy	ye	Eno+Ex	-cF	CDO	Emb. Centr.		nputat		ccc	Trend	MET	PAT	FT	CI	24-Hr.	Fest.	
RULES -	Locate of System at focal cloud co	Cloud Center point of urvature	Use S DT 1.5	Spiral /	Arc Le	ongth DT4.5	(VIS) Use Embedded Distance	IEIR) Use Surrounding Temperature	From Rutes	Pye Definition	Central So	(8)At Use Surrounding Temperature	CF	+BF=I	ΣŤ	Rules	24-Hr change 6-10-6	Model Expected T-Number		Use Rules	b	Adj. M Fost. i	if nec.	INITIALS
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08/2301			NO	DT	- US	ER	ULE	S									D	1.5	1.5	1.5	1.5	P	2.5	
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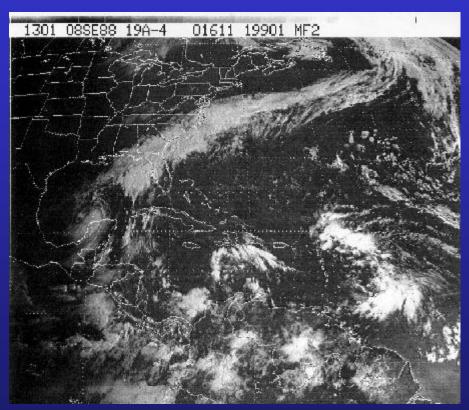
1201 UTC 9 Sep 1988

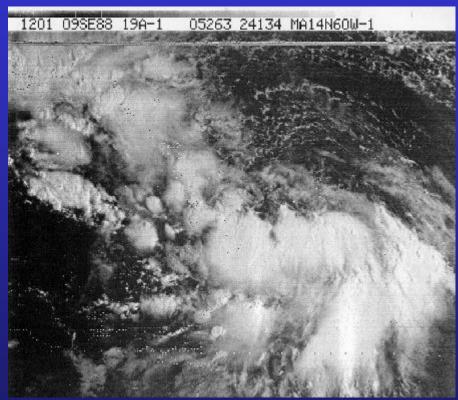


Issues for 1201 UTC 9 Sep 1988

- How has the system changed during the last 24 hours?
- What clues are there of this in the imagery?
- What cloud pattern can be used to measure this system?
- Is the cloud pattern clear cut?

24 hr change?

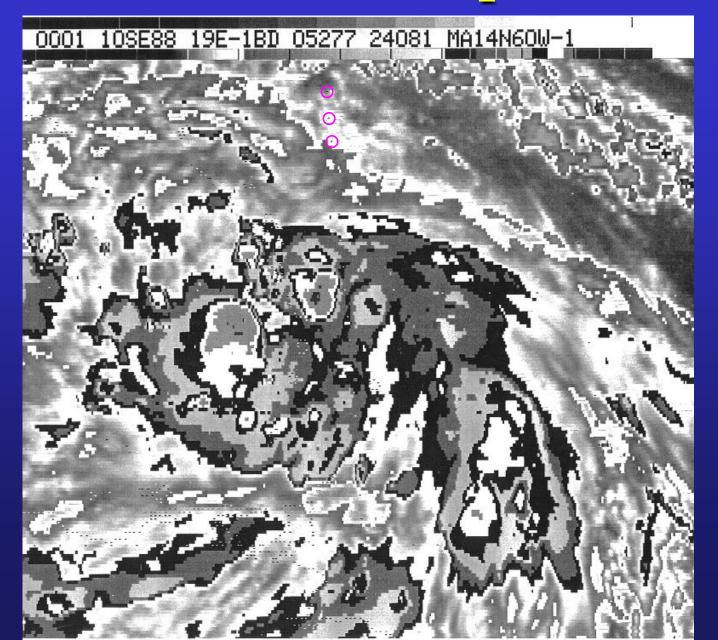




Vernon F. Dvorak May 1982		7	r-NU FOF			TIM/										T-N						OM INTS		EL
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08/2301			NO	DT	- US	ΕR	ULF	S									D	1.5	1.5	1.5	1.5	P	2.5	
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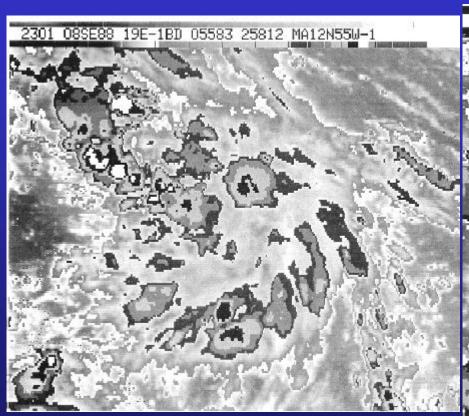
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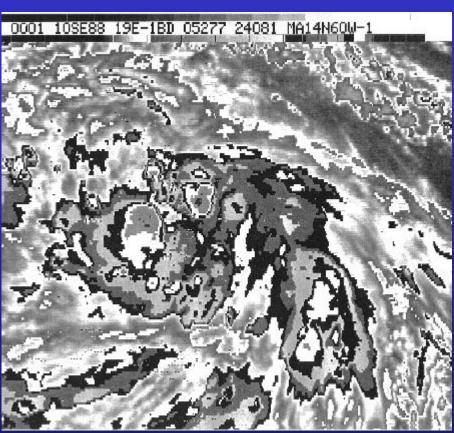


Issues for 0001 UTC 10 Sep 1988

- How has the system changed during the last 24 hours?
- What cloud pattern can be used to measure this system?
- Is the cloud pattern clear cut?

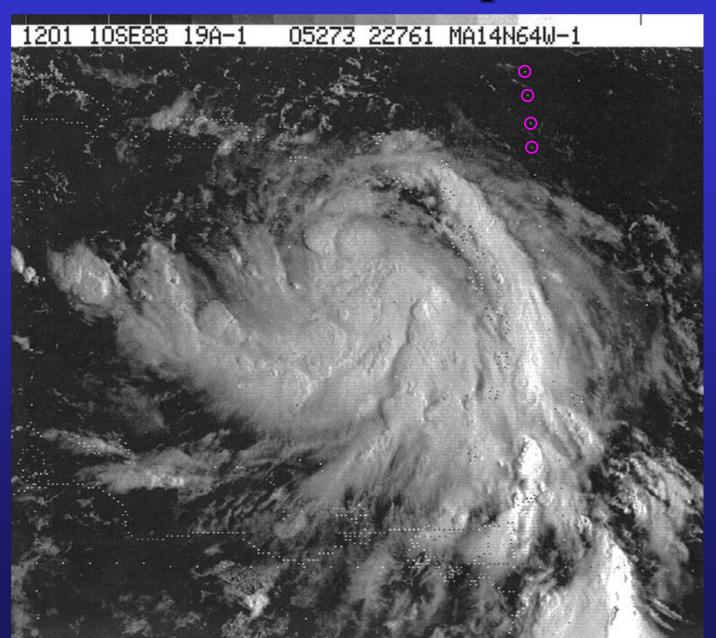
24 hr change?





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DESCRIPTION -	Loc	ation		ed Bar			E	/e	Eno+E	_{Adj} =CF	CDO	Emb. Centr.	Cor	nputat	ion	ccc	Trend	MET	PAT	FT	CI	24-Hr.	Fcst.	
HOLES -	Locate System at focal cloud co	Cloud Center point of urvature	Use S	Spiral DT2.5	Arc Le	DT 4.5	\sim 1	(EIR) Use Surrounding Temperature	From Rules	Eye Definition	Central OC Dense a a Overcast	(EIR) Use Surrounding Temperature	CF	+BF=0		Rules	eveloping change weakening bear ame	Model Expected T-Number	Pattern T-Number	Final BC T-Number 8 9	rent nsity iber	Adj. N Fcst.	if nec.	INITIALS
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08/1301				0.4											2.5		D	1.0	2.0	1.5	1.5	P	2.5	
08/2301				DT		$\mathbf{E} \mathbf{R}$	ULE										D	1.5	1.5	1.5	1.5	P	2.5	
09/1201		SH	EAR	0.8											2.0		D	2.5	2.0	2.0	2.0	P	2.5	
10/0001				0.65											3.0		D	2.5	3.0	2.5	2.5	P	3.5	
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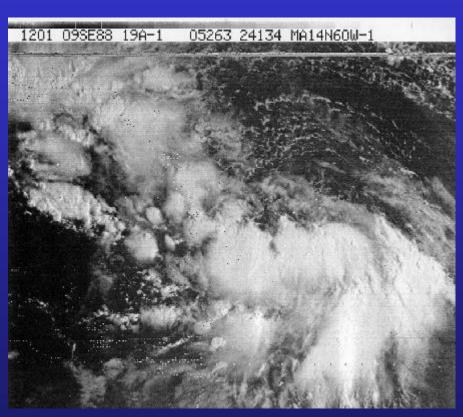
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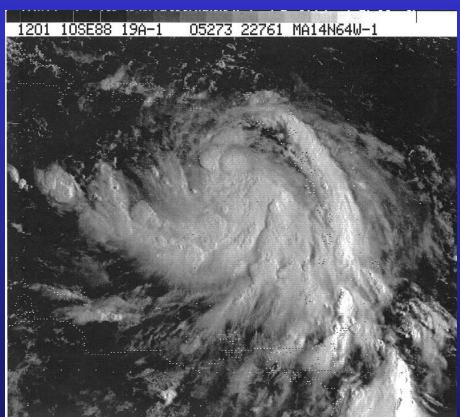


Issues for 1201 UTC 10 Sep 1988

- How has the system changed during the last 24 hours?
- What cloud pattern(s) can be used to measure this system?
- Is the cloud pattern(s) clear cut? If you tried multiple cloud patterns, do they give the same DT?

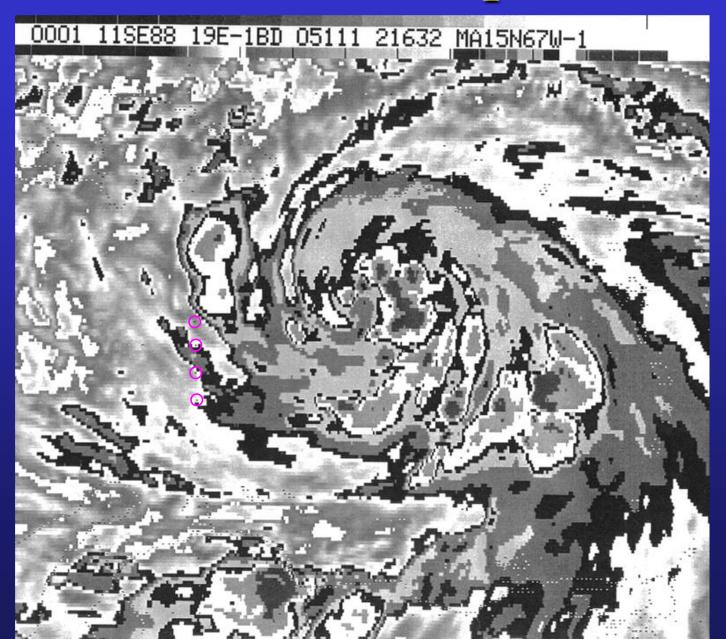
24 hr change?





STEP	Vernon F. Dvorak May 1982		٦			R ES	MITS	ATE	FRO		EAS						T-N				MAT			MOD	EL
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CF+BF=DT Use CH Change Ch CF+BF=DT Use CF	DESCRIPTION -	Loc	ation	Curve	ed Bar	d or s	Shear	E	ye	Eno+E	_{Adj} =CF	CDO	Emb. Centr.				ccc	Trend	MET	PAT	FT	c	24-Hr.	. Fcst.	
DATE/TIME LAT LONG Description Description CFBFDT Description Description <td></td> <td>System at focal</td> <td>Cloud Center point of urvature</td> <td>Use S</td> <td>Spiral DT2.5</td> <td>Arc Le</td> <td>ength DT4.5</td> <td>VIS) Use Embedded Distance</td> <td>(EIR) Use Surrounding Temperature</td> <td>-rom Jules</td> <td>Eye Definition</td> <td>Use Size</td> <td>ing ture</td> <td>CF</td> <td>+BF=I</td> <td>DT</td> <td>Rules</td> <td>change</td> <td>1</td> <td>er</td> <td>Rules</td> <td></td> <td>Fcst.</td> <td>if nec.</td> <td>LIALS</td>		System at focal	Cloud Center point of urvature	Use S	Spiral DT2.5	Arc Le	ength DT4.5	VIS) Use Embedded Distance	(EIR) Use Surrounding Temperature	-rom Jules	Eye Definition	Use Size	ing ture	CF	+BF=I	DT	Rules	change	1	er	Rules		Fcst.	if nec.	LIALS
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	10/0001				0.65											3.0							P	3.5	
10/1201 IRREGULAR 1.5° 2.5° 0.5 3.0°	10/1201		,		0.65													D	3.0	3.0	3.0	3.0	P	4.0	
	10/1201							I	RRE	GUI	LAR	1.5°		2.5+	0.5	3.0+					<u> </u>		1		
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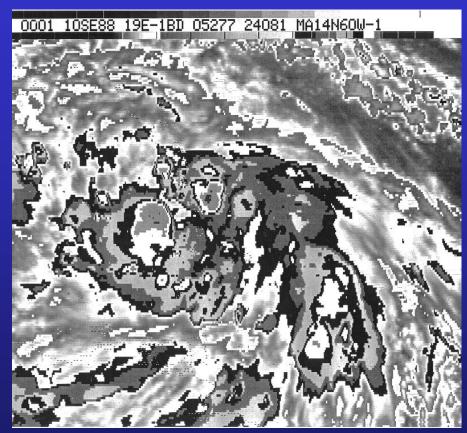
0001 UTC 11 Sep 1988

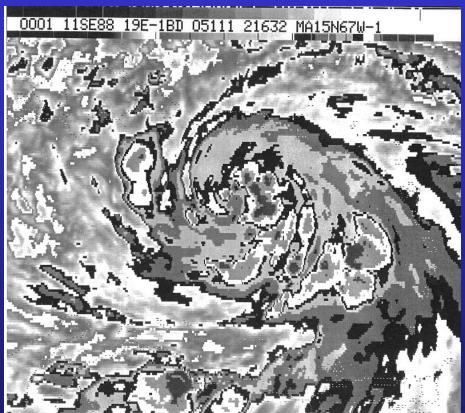


Issues for 0001 UTC 11 Sep 1988

- How has the system changed during the last 24 hours? Is it time to change the model development rate?
- What cloud pattern(s) can be used to measure this system? What cloud patterns cannot be used?
- Is the cloud pattern(s) clear cut? If you tried multiple cloud patterns, do they give the same DT?

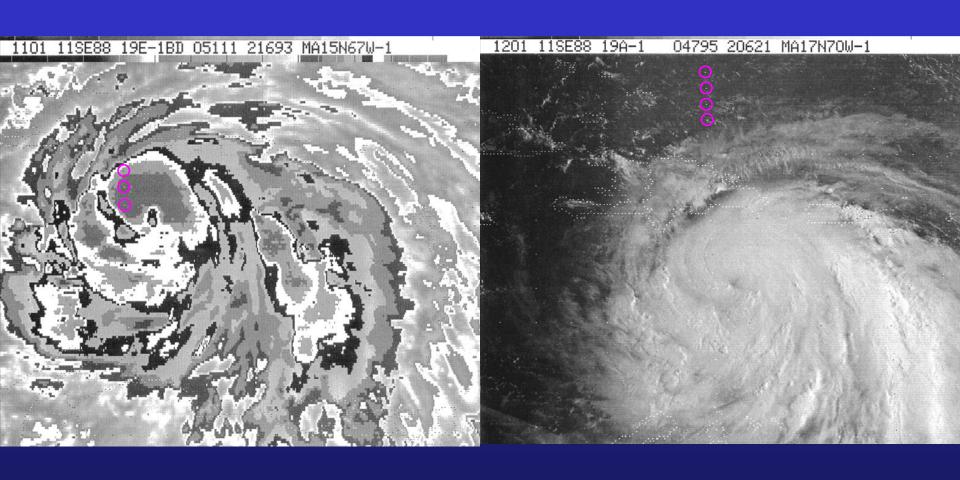
24 hr change?





Vernon F. Dvorak May 1982		7				TIM/										T-N					E FR		MOD	EL
STEP →		1		2A	,В			2	С		2D	2E	Data	T-Nu	mber	3	4	5	6	7,8	9	1	0	
DESCRIPTION -	Loc	ation	Curve	ed Bar	d or	Shear	Е	ye	Eno+E	_{Adj} =CF	CDO	Emb. Centr.		nputat		ccc	Trend	MET	PAT	FT	CI	24-Hr.	. Fcst.	
RULES -	Locate System at focal	Cloud Center point of urvature	Use DT 1.5	Spiral DT2.5	Arc Le	ength DT4.5	S) Use bedded tance	(EIR) Use Surrounding Temperature	ΕŞ	Eye Definition		(EIR) Use Surrounding Temperature	CF	+BF=I	TC	Cover Cover	24-Hr change සු සු			Use Rules		Adj. M Fcst.	Model if nec.	ALS
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08/1301				0.4											2.5		D	1.0	2.0	1.5	1.5	P	2.5	
08/2301			NO	DT	- US	ΕR	ULF	S									D	1.5	1.5	1.5	1.5	P	2.5	
09/1201		SH	EAR	0.8											2.0		D	2.5	2.0	2.0	2.0	P	2.5	
10/0001				0.65											3.0		D	2.5	3.0	2.5	2.5	P	3.5	
10/1201		,		0.65											3.0		D	3.0		3.0	3.0	P	4.0	
10/1201							I	RRE	GUI	LAR	1.5°		2.5+	0.5	3.0+									
11/0001						1.2									4.0		D	3.5	4.5	4.0	4.0	C	5.5	
11/0001			DG	EYI	IN	MG		MG	4.5	-0.5			4.0	0.0	4.0									
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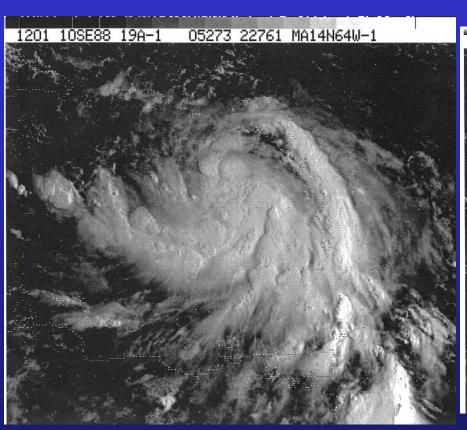
1101/1201 UTC 11 Sep 1988

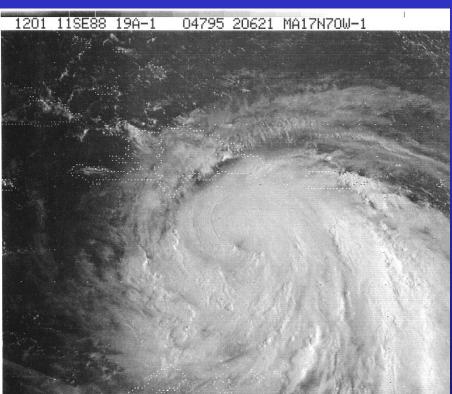


Issues for 1101/1201 UTC 11 Sep 1988

- How has the system changed during the last 24 hours? Is it time to change the model development rate?
- What cloud patterns can be used to measure this system? What cloud pattern might be best?
- If you tried multiple cloud patterns, do they give the same DT?
- Beware constraints?

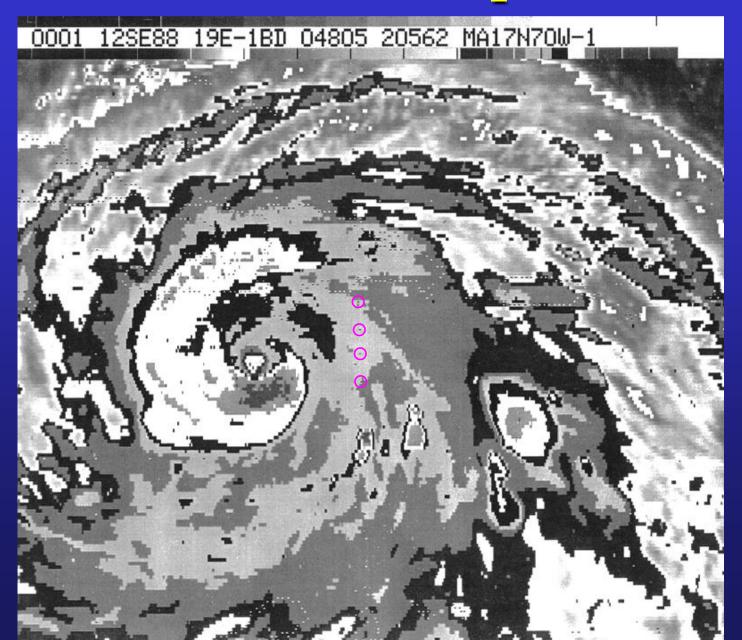
24 hr change?





Vernon F. Dvorak May 1982					R ES											T-N						OM	MOD	EL
STEP -	•			2A	,В			2	С		2D	2E	Data	T-Nu	mber	3	4	5	6	7,8	9	1	0	
DESCRIPTION -	Loca	ation	Curve	ed Bar	nd or S	Shear	E	ye	Eno+E	Adj=CF	CDO	Emb. Centr.		nputat		ccc	Trend	MET	PAT	FT	CI	24-Hr.	. Fcst.	
RULES	Locate (System		Use S	Spiral	Arc Le	ngth DT4.5	e 9d	ding ture			Use Size	e ding ture	CF	+BF=	TC	Use Rules	24-Hr change			Use Rules		Adj. N Fcst.	Model if nec.	S
	at focal	point of	6/)	<i>(</i>	010.5	D14.5	(VIS) Use Embedded Distance	(EIR) Use Surrounding Temperature	From	Eye Definition	Central Dense Overcast	(EIR) Use Surrounding Temperature				Central Cold Cover	guir							INITIALS
	Cioud ct	, valure	\sim	\approx	5											300	D-developing W-weakening S-same	Model Expected T-Number	Pattern T-Number	Final T-Number	ent nsity iber		Forecast Intensity Number	Ę
DATE/TIME	LAT	LONG	2	2)	2)	<u>(B</u>	(•)		Eno	Eadj	(Z)	(3)	CF	BF		0					Current Intensity Number	List Rule Used		=
08/1301				0.4											2.5		D	1.0	2.0	1.5	1.5		2.5	
08/2301			NO	DT	- US	ER	ULE										D	1.5	1.5	1.5	1.5		2.5	
09/1201		SH	EAR	0.89											2.0		D	2.5	2.0	2.0	2.0	P	2.5	
10/0001				0.65											3.0		D	2.5	3.0	2.5	2.5	P	3.5	
10/1201				0.65											3.0		D	3.0	3.0	3.0	3.0	P	4.0	
10/1201							I	RRE	GUI	LAR	1.5°		2.5+	0.5	3.0+							1		
																					L			
11/0001						1.2									4.0		D	3.5	4.5	4.0	4.0	C	5.5	
11/0001			DG	EYI	EIN	MG		MG	4.5	-0.5			4.0	0.0	4.0						<u> </u>			
11/1101		L	GE	YE I	NL	G/W		LG	5.0 ⁺	0.0			5.0 ⁺	0.0	5.0 ⁺		D ⁺	4.5	6.0	4.5	4.5	C	6.0	
11/1101												LG	4.5 +	0.0	4.5+									
11/1201							0.50		4.0	-0.5			3.5	1.0 +	4.5+		\mathbf{D}^{+}	4.5	5.0	4.5+	4.5+	C	6.0	
11/1201						1.5									4.5									
11/1201							I	RRE	GUI	LAR	2.30		3.0	1.0+	4.0+									
														,										
																						L		
																				L	ļ			
										3														
						,																		

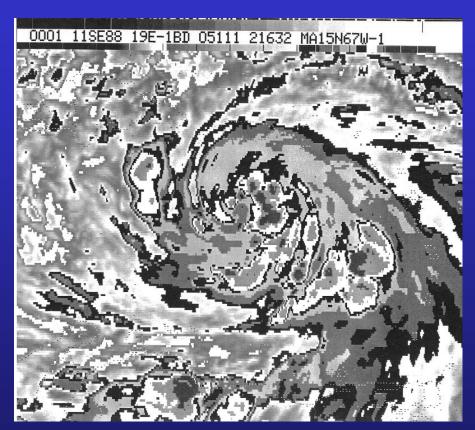
0001 UTC 12 Sep 1988

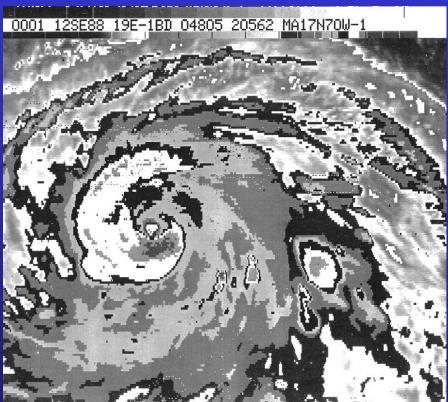


Issues for 0001 UTC 12 Sep 1988

- How has the system changed during the last 24 hours? Do we need to change the model development rate?
- What cloud pattern is best to measure this system?
- Is there a need for infrared banding?
- Which T-number should be the FT?
- Beware constraints?

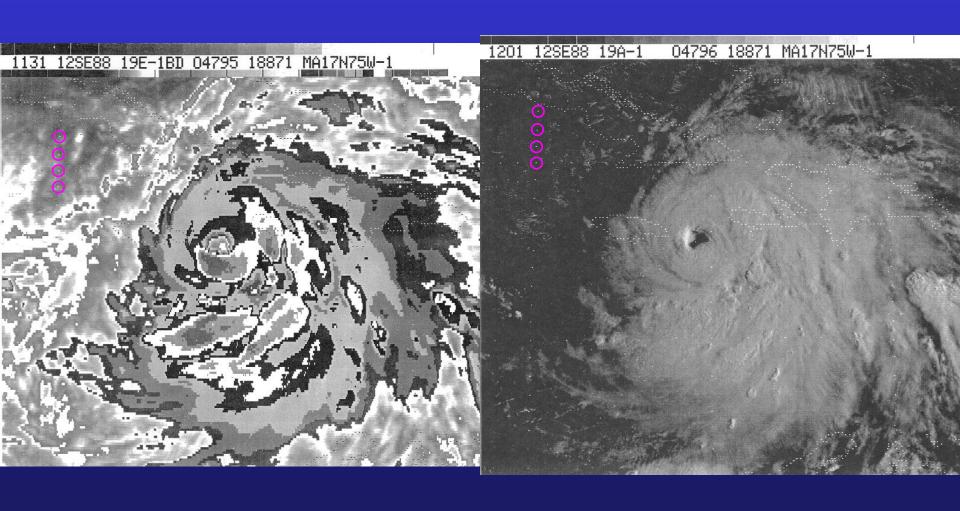
24 hr change?





Vernon F. Dvorak May 1982		Т			R ES											T-N					E FR		MOD S	EL
STEP -	•			2A	,В			2	С		2D	2E	Data	T-Nu	mber	3	4	5	6	7,8	9	1	0	
DESCRIPTION -	Loca	ation			nd or S		E	ye	Eno+E	Adj=CF	CDO	Emb. Centr.	Cor	nputat	ion	ccc	Trend	MET	PAT	FT	CI	24-Hr		
RULES	Locate (System				Arc Le		e e	se ding sture		u	Use Size	se ding sture	CF	+BF=0	DT	Use Rules	24-Hr change			Use Rules			Model if nec.	ις.
	at focal	point of	6/)	9	0.0	D 1 4.5	(VIS) Use Embedded Distance	(EIR) Use Surrounding Temperature	From	Eye Definition	Central Dense Overcast	(EIR) Use Surrounding Temperature				Central Cold Cover	gning		,					INITIALS
	0.000		5	\approx	5			000		1						333	D-developing W-weakening S-same	Model Expected T-Number	Pattern T-Number	Final T-Number	Current Intensity Number		Forecast Intensity Number	=
DATE/TIME	LAT	LONG	2	2)	2	<u>(B</u>	(-)		Eno	Eadj	(Z)	(9)	CF	BF		0						List Rule Used		
08/1301				0.4											2.5		D	1.0	2.0	1.5	1.5	P	2.5	
08/2301			NO	DT	- US	ER	ULE	S									D	1.5	1.5		1.5	P	2.5	
09/1201		SH	EAR	0.89											2.0		D	2.5	2.0	2.0	2.0	P	2.5	
10/0001				0.65											3.0		D	2.5	3.0		2.5	P	3.5	
10/1201				0.65											3.0		D	3.0	3.0	3.0	3.0	P	4.0	
10/1201							I	RRE	GUI	LAR	1.5°		2.5+	0.5	3.0 ⁺							1		
11/0001						1.2									4.0		D	3.5	4.5	4.0	4.0	C	5.5	
11/0001			DG	EYI	EIN	MG		MG	4.5	-0.5			4.0	0.0	4.0									
11/1101		L	GE	YE I	NL	G/W		LG	5.0 ⁺	0.0			5.0 ⁺	0.0	5.0 ⁺		\mathbf{D}^{+}	4.5	6.0	4.5	4.5	C	6.0	
11/1101													4.5+		4.5+									
11/1201							0.50		4.0	-0.5			3.5	1.0 +	4.5+		\mathbf{D}^{+}	4.5	5.0	4.5 ⁺	4.5 ⁺	C	6.0	
11/1201						1.5									4.5									
11/1201							I	RRE	GUI	LAR	2.30		3.0	1.0+	4.0+									
				-																				
12/0001			OW	EY	E IN	LG		LG	5.0	0.0	2		5.0	0.0	5.0		\mathbf{D}^{+}	5.5	5.5	5.0	5.0	P	6.0	
										3														
													-											
	L											L			L			·	L					

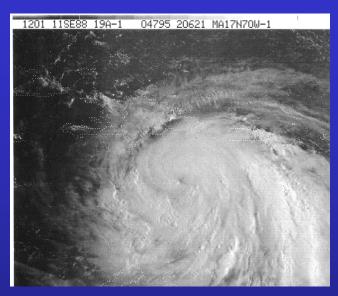
1131/1201 UTC 12 Sep 1988

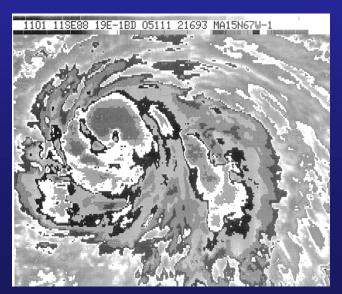


Issues for 1131/1201 UTC 12 Sep 1988

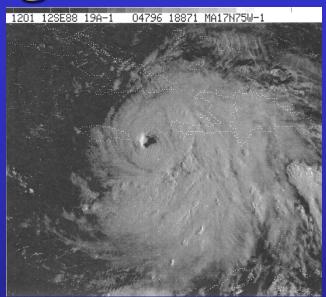
- How has the system changed during the last 24 hours? Is it time to change the model development rate?
- Is there anything unusual about the eye number and eye adjustment? How about the eye size?
- Beware constraints?

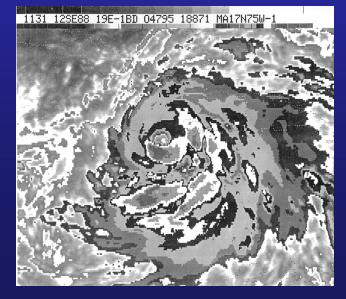
24 hr change?





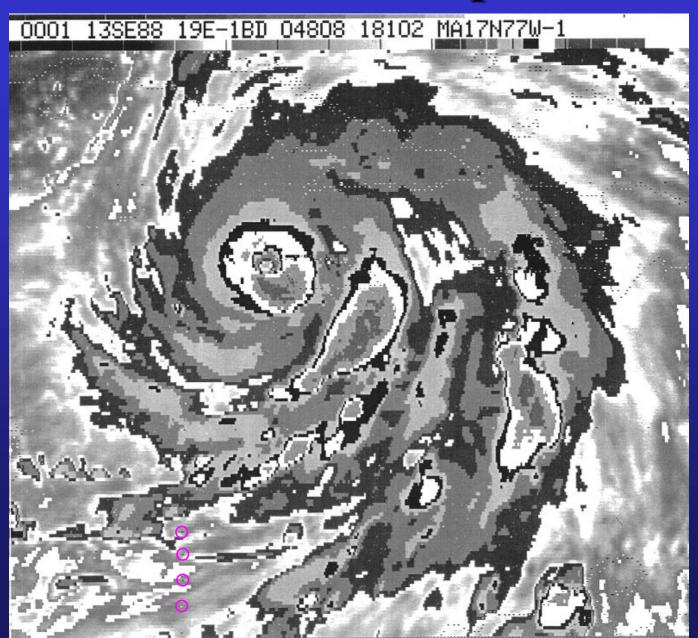
D+





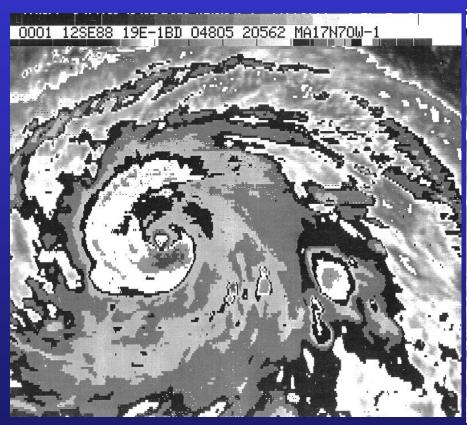
Vernon F. Dvorak May 1982		Т					ATE MBEI				JREN	MEN.				T-N					E FR		MOD	EL
STEP -	1	ŀ		2A	,В			2	С		2D	2E	Data	T-Nu	mber	3	4	5	6	7,8	9	1	0	
DESCRIPTION -	Loca	ation		ed Bar			E	/e	Eno+E	Adj=CF	CDO	Emb. Centr.		nputat		ccc	Trend	MET	PAT	FT	CI	24-Hr		
	Locate (System at focal cloud cu	Center point of	DT 1.5	Spiral DT 2.5			(VIS) Use Embedded Distance	(EIR) Use Surrounding Temperature	es es	Eye Definition	Central S S Noense & & Overcast	(EIR) Use Surrounding Temperature	CF	+BF=I	DT	Coold Sover	24-Hr change			Use Rules		Adj. I Fost.	Model if nec.	ALS
DATE/TIME	LAT	LONG	3	\Im	2	9	(Vi Em	m	Z From SZ Rules	شَّةً E _{Adj}	and Control	(El	CF	BF	DT	\$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	D-develop W-weaken S-same	Model Expected T-Number	Pattern T-Number	Final T-Number	Current Intensity Number	List Rule Used	Forecast Intensity Number	INITIALS
08/1301				0.4											2.5		D	1.0	2.0	1.5	1.5	P	2.5	
08/2301			NO	DT	- US	ER	ULE	S									D	1.5	1.5	1.5	1.5	P	2.5	
09/1201		SH	EAR	0.8											2.0		D	2.5	2.0	2.0	2.0	P	2.5	
10/0001				0.65											3.0		D	2.5	3.0	2.5	2.5	P	3.5	
10/1201				0.65											3.0		D	3.0	3.0	3.0	3.0	P	4.0	
10/1201					,		I	RRE	GUI	LAR	1.5°		2.5+	0.5	3.0 ⁺									
																		,			L			
11/0001						1.2									4.0		D	3.5	4.5	4.0	4.0	C	5.5	
11/0001			DG	EYI	EIN	MG		MG	4.5	-0.5			4.0	0.0	4.0						<u> </u>			
11/1101		\mathbf{L}	GE	YE I	NL	G/W		LG	5.0 ⁺	0.0			5.0 ⁺	0.0	5.0 ⁺		\mathbf{D}^{+}	4.5	6.0	4.5	4.5	C	6.0	
11/1101												LG	4.5+	0.0	4.5+									
11/1201							0.50		4.0	-0.5			3.5	1.0+	4.5+		\mathbf{D}^{+}	4.5	5.0	4.5+	4.5 ⁺	C	6.0	
11/1201						1.5									4.5									
11/1201							I	RRE	GUI	LAR	2.30		3.0	1.0+	4.0+									
														,										
12/0001			<u>OW</u>	EY	E IN	LG		LG	5.0	0.0			5.0	0.0	5.0		\mathbf{D}^{+}	5.5	5.5	5.0	5.0	P	6.0	
12/1131		WM	G E	YE:	IN L	G/B		LG						0.0			D ⁺	6.0		6.0	1		7.5	
12/1201							0.90		5.5	0.0			5.5	1.0	6.5		\mathbf{D}^{+}	6.0	5.5	6.0	6.0	C	7.5	
										3														
						,																		

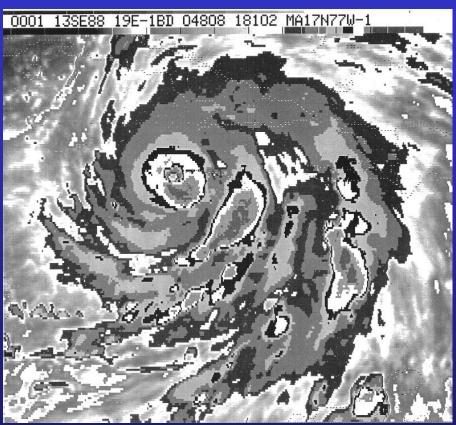
0001 UTC 13 Sep 1988



Issues for 0001 UTC 13 Sep 1988

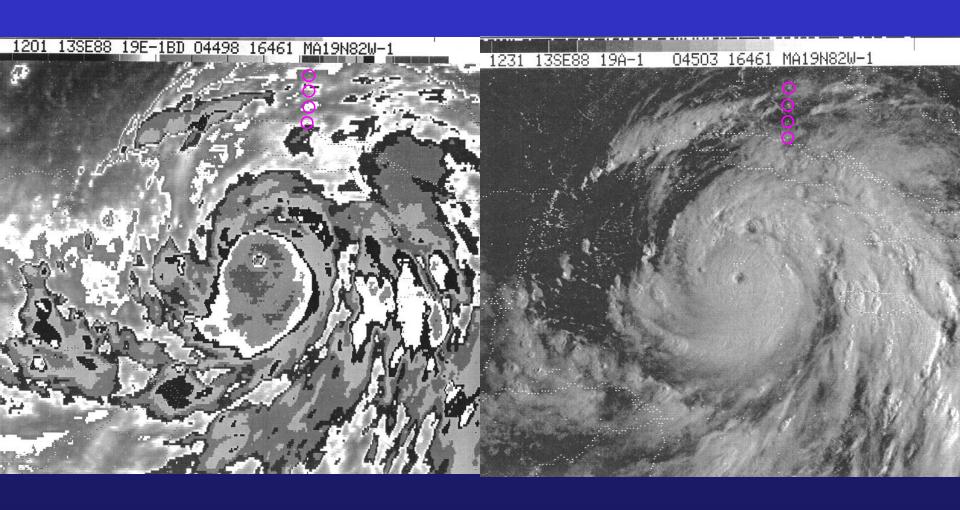
- How has the system changed during the last 24 hours? Any change in development rate?
- The system has passed over Jamaica during the last 12 hours. Should that affect the analysis?
- Is there anything unusual about the eye number and eye adjustment?
- Is there a need for infrared banding?
- What about the PT?





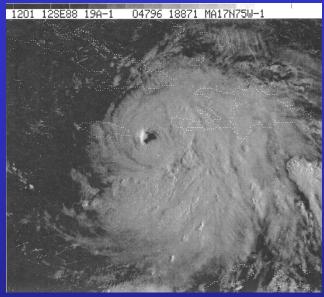
Vernon F. Dvorak May 1982		Т					ATE MBEI	FRO	мм	EASI	JREN	MEN ⁻	rs			_					E FR		MOD	EL
STEP -	•	ł		2A					C		2D	2E		T-Nu	mber	3	4	5	6	7,8	9		0	
DESCRIPTION -	Loca	ation	Curve	d Bar	d or S	Shear	E	ye	Eno+E	dj=CF	CDO	Emb. Centr.		nputat		ccc	Trend	MET	PAT	FT	СІ	24-Hr	. Fcst.	
RULES -	Locate (System		Use S		Arc Le		g e	ding		c	Use Size		CF	+BF=	T		24-Hr change			Use Rules		Adj. I Fcst.	Model if nec.	ος l
	at focal	point of	6/)	%	013.3	D14.5	(VIS) Use Embedded Distance	(EIA) Use Surrounding Temperature	From	Eye Definition	Central Opense Overcast	(EIR) Use Surrounding Temperature				Central Cold Cover	guid							INITIALS
	0.000		5	\approx	5			m									evelop veaker ame	Model Expected T-Number	Pattern T-Number	Final T-Number	Current Intensity Number	a P	Forecast Intensity Number	=
DATE/TIME	LAT	LONG		2)	2)	<u>(D)</u>	(•)		E _{No}	LAdj	(Z)	(9)	CF	BF		0								
08/1301				0.4											2.5		D	1.0	2.0	1.5	1.5	P	2.5	
08/2301			NO	DT		ER	ULE										D	1.5	1.5	1.5	1.5	P	2.5	
09/1201		SH	EAR												2.0		D	2.5		2.0	2.0	P	2.5	
10/0001				0.65											3.0			2.5		2.5	2.5	P	3.5	
10/1201				0.65					~						3.0		D	3.0	3.0	3.0	3.0	P	4.0	
10/1201								RE	GUI	<u> AR</u>	1.5°		2.5+	0.5	3.0+							-		
14/0004						1.0									4.0		D	2.5	4 =	4.0	4.0			
11/0001			DC	T 7 7 7		1.2		7.60	4 =	0. =			4.0	0.0	4.0		D	3.5	4.5	4.0	4.0	C	5.5	-
11/0001			DG	EYI		MG		MG	4.5	-0.5			4.0	0.0	4.0									
11/1101		_		7		~ /**		TO	5 04	0.0			5 0+	0.0	5 0-		D±	1.5	(()	4.5	4.5		(0	
11/1101		L	GE)	YEI	N L	<u> </u>		LG	5.0+	0.0		TO	5.0 ⁺		5.0		D ⁺	4.5	0.0	4.5	4.5	C	6.0	-
11/1101						-	0.50		4.0	0.5		LG	4.5 ⁺			-	\mathbf{D}^{+}	4.5	5.0	4 5 +	4.5+	C	6.0	
11/1201 11/1201						1.5	0.50		4.0	-0.5			3.5	1.0+	4.5		D	4.5	5.0	4.5	4.5		0.0	\dashv
11/1201						1.5		DDE	GUI	A D	2 20		3.0	1 0+										$\overline{}$
11/1201							- 1		GÚI	JAN	4.5		3.0	1.0	4.0					-				$\overline{}$
12/0001			ow	FV	F IN	IC		LG	5.0	0.0		-	5.0	0.0	5.0		\mathbf{D}^{+}	5.5	55	5.0	5.0	P	6.0	-
12/0001			J 11	121.	2 11	LO			2.0	0.0			2.0	0.0	2.0					2.0	2.0	_	0.0	
12/1131		WM	G F	YE	NI	G/R		LG	5.0	1.0			6.0	0.0	6.0		\mathbf{D}^{+}	6.0	5.5	6.0	6.0	C	7.5	
12/1201		4 4 141			1 1	لو بي	0.90		5.5	0.0			5.5				\mathbf{D}^{+}	6.0		6.0	6.0		7.5	
										303					3.0			5.0		5.5	5.5		- 10	
13/0001)W]	EYF	IN	B/W		В	5.5 ⁺	0.5			6.0+	0.5	6.5+		\mathbf{D}^{+}	6.5	6.5	6.5	6.5	C	8.0	
12,0001									-	3.0			3.0		3.0						2.3			
												- 1												
																			-					

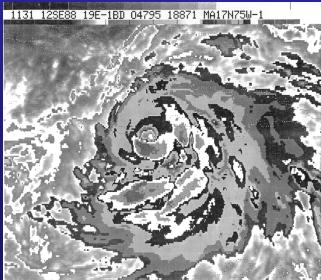
1201/1231 UTC 13 Sep 1988



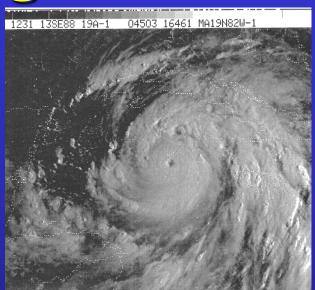
Issues for 1201/1231 UTC 13 Sep 1988

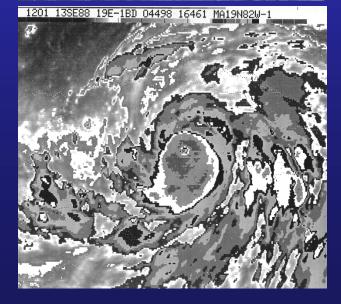
- How has the system changed during the last 24 hours? Any change in development rate?
- Is there anything unusual about the eye number and eye adjustment? How about the eye size? Can we see to the bottom of the eye?
- Is there a need for infrared banding?
- What about the PT?





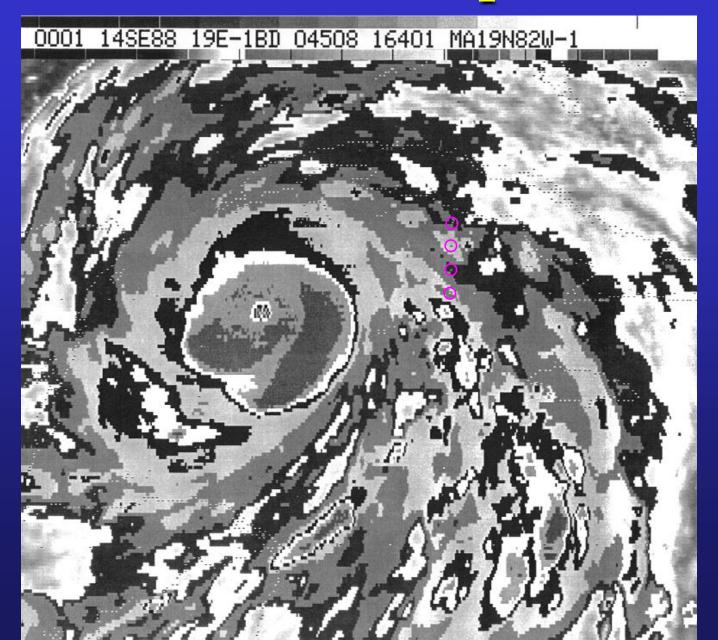






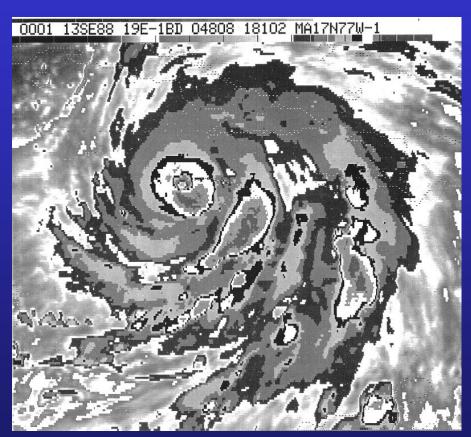
Vernon F. Dvorak May 1982			T-NUI FOR			STIMA										T-N					E FR		MOD	EL
STEP -	,	1			A,B				C		2D	2E		T-Nur	mber	3	4	5	6	7,8	9		0	
DESCRIPTION -	Loc	ation	Curve	ed Ban	nd or	Shear	E.	ye	ENo+EA	_{Adj} =CF	CDO	Emb. Centr.		nputat		ССС	Trend	MET	PAT	FT	СІ	24-Hr.	Fcst.	
RULES -	Locate (System at focal cloud cu	Cloud Center point of urvature	DT 1.5	Spiral /	Arc Le	ngth DT4.5	VIS) Use imbedded Distance	(EIR) Use Surrounding Temperature	From Rules	Eye Definition	Central S.C. Noense a a Overcast	(EIR) Use Surrounding Temperature	CF	+BF=(TΟ	Cover self	24-Hr change buide	J.	er -	Use Rules			if nec.	INITIALS
DATE/TIME	LAT	LONG	$ \cap $	\mathcal{D}	2	9	(·)	100	Eno	1		(i)	CF	BF				Model Expected T-Number	Pattern T-Numbe	Final T-Number	Current Intensity Number			Z Z
08/1301	'			0.4											2.5		D	1.0	2.0	1.5	1.5	P	2.5	
08/2301	<u> </u>		NO		+	E R	<u>ULF</u>	<u>S</u>									D	1.5	1.5	1.5	1.5	P	2.5	
09/1201	L'	SH	++	+	+	<u> </u>		<u> </u>	<u> </u>						2.0		D	2.5	2.0	2.0	2.0	P	2.5	
10/0001	'	<u> </u>		0.65	+			<u> </u>	<u> </u>						3.0					2.5	2.5	P	3.5	
10/1201		1		0.65	<u> </u>	\perp									3.0		D	3.0	3.0	3.0	3.0	P	4.0	
10/1201		1'					IJ	RRE	GUI	LAR	1.50		2.5+	0.5	3.0+									
11/0001						1.2									4.0		D	3.5	4.5	4.0	4.0	C	5.5	
11/0001			DG	EY	E IN	MG		MG	4.5	-0.5			4.0	0.0	4.0									
	1 - 1	\Box '																						
11/1101	$\overline{}$		GE	YE I	NL	G/W		LG	5.0 ⁺	0.0			5.0 ⁺	0.0	5.0 ⁺		\mathbf{D}^{+}	4.5	6.0	4.5	4.5	C	6.0	
11/1101	$\sqrt{}$											LG	4.5+	0.0	4.5+									
11/1201							0.50		4.0	-0.5				1.0+	4.5+		\mathbf{D}^{+}	4.5	5.0	4.5 ⁺	4.5 ⁺	C	6.0	
11/1201						1.5									4.5									
11/1201							I	RRE	GUI	LAR	2.30		3.0	1.0+	4.0+									
12/0001			OW	EY	E IN	LG		LG	5.0	0.0	2		5.0	0.0	5.0		\mathbf{D}^{+}	5.5	5.5	5.0	5.0	P	6.0	
12/1131		$\overline{\mathbf{W}}$	1G E	YE	$\overline{\mathbf{N}}$	G/B		LG	5.0	1.0			6.0	0.0	6.0		\mathbf{D}^{+}	6.0	5.5	6.0	6.0	C	7.5	
12/1201		[]					0.90		5.5	0.0			5.5	1.0	6.5		\mathbf{D}^{+}	6.0	5.5	6.0	6.0	C	7.5	
										3														
13/0001			ow i	EYF	IN	B/W		В	5.5+	0.5			6.0+	0.5	6.5+		\mathbf{D}^{+}	6.5	6.5	6.5	6.5	\mathbf{C}	8.0	
13/1201		T'	G E	YE	IN C	\mathbf{MG}'	7	MG	6.5	0.5	***		7.0	0.5	7.5		\mathbf{D}^{+}	7.5	7.0	7.5	7.5	C	8.0	
13/1231						+	0.90		-	0.5	-		6.0	1.5			\mathbf{D}^{+}	7.5	7.0		7.5	C	8.0	

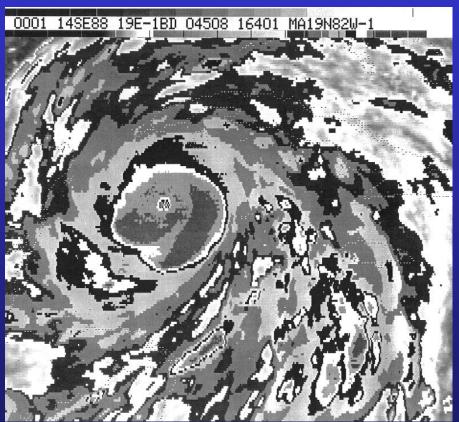
0001 UTC 14 Sep 1988



Issues for 0001 UTC 14 Sep 1988

- How has the system changed during the last 24 hours? Any change in development rate?
- Is there anything unusual about the eye number and eye adjustment? How about the eye size? Can we see to the bottom of the eye?
- Is there a need for infrared banding?
- What about the PT? The FI?

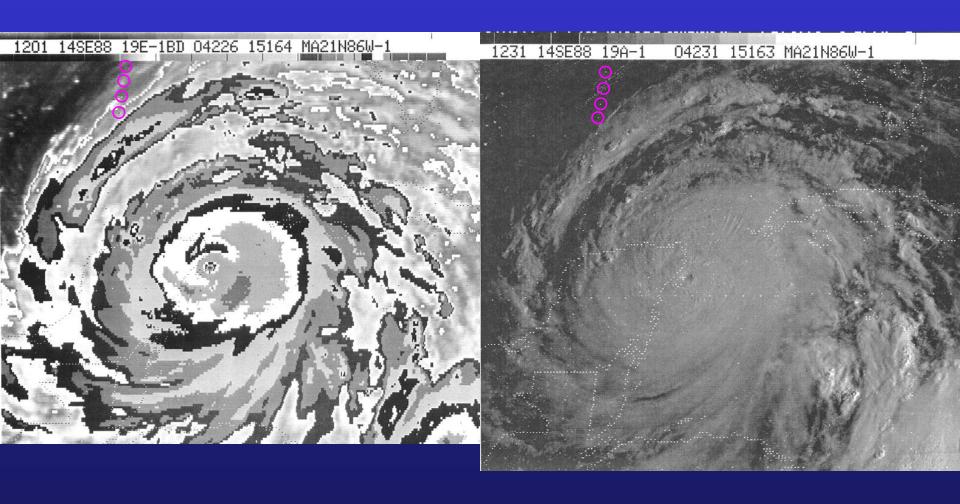




Vernon F. Dvorak May 1982		Т			R ES TA T											T-N	_				E FRO		MOD	EL
STEP -		1	<u> </u>	2A					C		2D	2E		T-Nur	mber	3	4	5	6	7,8	9	1	$\overline{}$	
DESCRIPTION -	Loc	ation	Curve	d Bar	nd or S	Shear	E	ye	Eno+E	Adj=CF	CDO	Emb. Centr.		nputat		ccc	Trend	MET	PAT	FT	CI	24-Hr.	Fcst.	
RULES -	Locate (System	Cloud			Arc Le		a P	e ding ture		_	Use Size	e Jing ture	CF	+BF=0	TC	Use Rules	24-Hr change			Use Rules		Adj. N	Model if nec.	S
		point of	6/∩	<i>(</i>)	013.5	014.5	(VIS) Use Embedded Distance	(EIR) Use Surrounding Temperature	From	Eye Definition	Central Dense Overcast	(EIR) Use Surrounding Temperature				Central Cold Cover	guing							INITIALS
	0.000		$ \zeta $	\approx	5			_		1							D-developing W-weakening S-same	Model Expected T-Number	Pattern T-Number	Final T-Number	Current Intensity Number	6 P	Forecast Intensity Number	=
DATE/TIME	LAT	LONG		<u>حرا</u>	2)	(B)	(·)		Eno	Eadj	(g)	0	CF	BF		0								
08/1301				0.4											2.5		D	1.0	2.0	1.5	1.5	P	2.5	
08/2301			NO			ER	ULE										D	1.5	1.5	1.5	1.5	P	2.5	
09/1201		SH	EAR									-			2.0			2.5	2.0	2.0	2.0	P	2.5	
10/0001			_	0.65	_										3.0			2.5	3.0		2.5	P	3.5	
10/1201				0.65											3.0		D	3.0	3.0	3.0	3.0	P	4.0	
10/1201								RRE	GUI	LAR	1.5°		2.5+	0.5	3.0+									
11/0001						1.2									4.0		D	3.5	4.5	4.0	4.0	C	5.5	
11/0001			DG	EYI	E IN	MG		MG	4.5	-0.5			4.0	0.0	4.0									
11/1101		L	GE	YE I	NL	G/W		LG	5.0 ⁺	0.0			5.0 +	0.0	5.0 ⁺		\mathbf{D}^{+}	4.5	6.0	4.5	4.5	C	6.0	
11/1101												LG	4.5+	0.0	4.5+									
11/1201							0.5°		4.0	-0.5			3.5	1.0 +	4.5+		\mathbf{D}^{+}	4.5	5.0	4.5 +	4.5+	C	6.0	
11/1201						1.5									4.5									
11/1201							I	RRE	GU I	LAR	2.30		3.0	1.0 +	4.0+									
12/0001			OW	EY	E IN	LG		LG	5.0	0.0	4		5.0	0.0	5.0		\mathbf{D}^{+}	5.5	5.5	5.0	5.0	P	6.0	
12/1131		WM	G E	YE :	IN L	G/B		LG	5.0	1.0			6.0	0.0	6.0		\mathbf{D}^{+}	6.0	5.5	6.0	6.0	C	7.5	
12/1201							0.90		5.5	0.0			5.5	1.0	6.5		\mathbf{D}^{+}	6.0	5.5	6.0	6.0	C	7.5	
										3														
13/0001)W]	EYE	IN	B/W		В	5.5 ⁺	0.5			6.0+	0.5	6.5		\mathbf{D}^{+}	6.5	6.5	6.5	6.5	\mathbf{C}	8.0	
13/1201		D	G E	YE]	N C	MG	(MG	6.5	0.5	***	-	7.0	0.5	7.5		\mathbf{D}^{+}	7.5	7.0	7.5	7.5	C	8.0	
13/1231							0.90			0.5	_		6.0	1.5			D +	7.5	7.0	7.5	7.5	C	8.0	

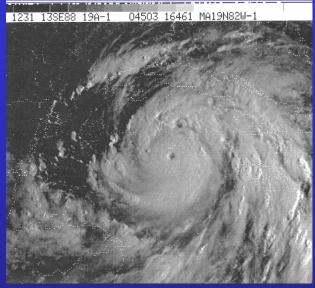
Vernon F. Dvorak May 1982		٦	r-NU FOF	MBE DA	R ES	MITS	ATE MBE	FRO R (D	М М Т) С	EASI OMP	UREI UTA	MEN.	TS 1			T-N						OM		EL
STEP -		1		2 <i>A</i>	,B			2	С		2D	2E	Data	T-Nu	mber	3	4	5	6	7,8	9	1	0	
DESCRIPTION -	Loc	ation	Curve	ed Bar	nd or	Shear	Е	ye	Eno+E	Adj=CF	CDO	Emb. Centr.	Cor	nputat	ion	ccc	Trend	MET	PAT	FT	СІ	24-Hr.	Fcst.	
1	Locate System at focal cloud c	Center point of urvature	Use S DT 1.5	Spiral DT 2.5	Arc Le	ength DT 4.5	(VIS) Use Embedded Distance	(EIR) Use Surrounding Temperature	From S Rules			(EIR) Use Surrounding Temperature		+BF=		Cover Cover	O-developing W-weakening B-same		Pattern T-Number	Final BC T-Number 8 9	Current Intensity Number	Role Nosed	Forecast Intensity Number Support	INITIALS
DATE/TIME	LAT	LONG		\leq	\sim	\sim					2	0				(2)								-
14/0001		WN.	G E	YE.	INC	MG		MG	6.5	1.0			7.5	0.5	8.0		\mathbf{D}^{+}	8.0	7.5	8.0	8.0	G?	???	
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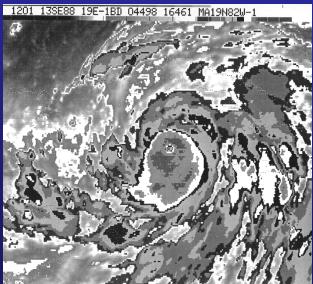
1201/1231 UTC 14 Sep 1988

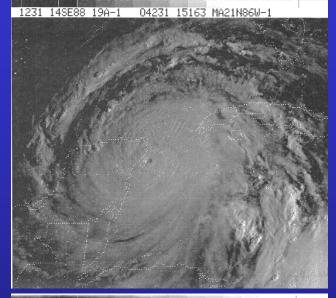


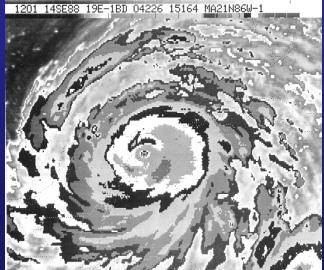
Issues for 1201/1231 UTC 14 Sep 1988

- Is there any change in development trend?
- Is there anything unusual about the eye number and eye adjustment? How about the eye size? Can we see to the bottom of the eye?
- Can IR banding be used?
- What about the PT? The FI?
- What physically might be happening to the storm?







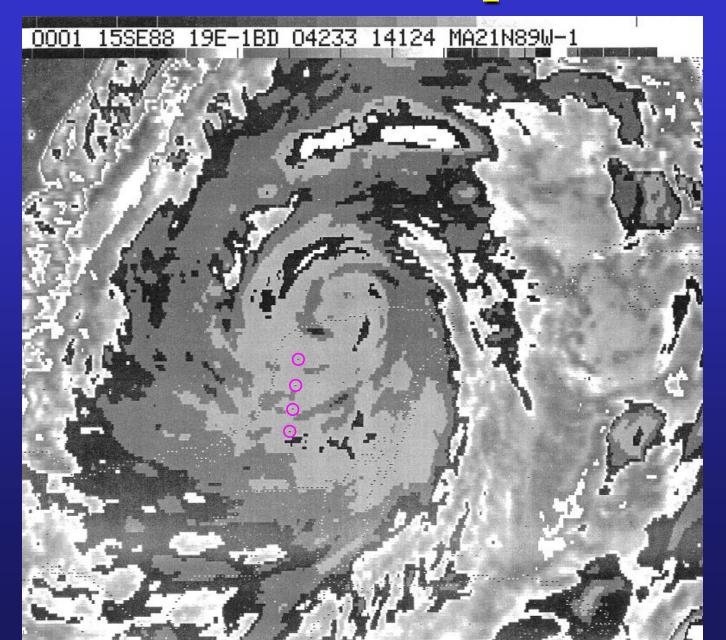


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Vernon F. Dvorak May 1982			T-NUI FOR			STIMA										T-N					E FR		MOD	EL
STEP -	,	1			A,B				C		2D	2E		T-Nur	mber	3	4	5	6	7,8	9		0	
DESCRIPTION -	Loc	ation	Curve	ed Ban	nd or	Shear	E.	ye	ENo+EA	_{Adj} =CF	CDO	Emb. Centr.		nputat		ССС	Trend	MET	PAT	FT	СІ	24-Hr.	Fcst.	
RULES -	Locate (System at focal cloud cu	Cloud Center point of urvature	DT 1.5	Spiral /	Arc Le	ngth DT4.5	VIS) Use imbedded Distance	(EIR) Use Surrounding Temperature	From Rules	Eye Definition	Central S.C. Noense a a Overcast	(EIR) Use Surrounding Temperature	CF	+BF=(TΟ	Cover self	24-Hr change buide	J.	er -	Use Rules			if nec.	INITIALS
DATE/TIME	LAT	LONG	$ \cap $	\mathcal{D}	2	9	(·)	100	Eno	1		(i)	CF	BF				Model Expected T-Number	Pattern T-Numbe	Final T-Number	Current Intensity Number			Z Z
08/1301	'			0.4											2.5		D	1.0	2.0	1.5	1.5	P	2.5	
08/2301	<u> </u>		NO		+	E R	<u>ULF</u>	LS_									D	1.5	1.5	1.5	1.5	P	2.5	
09/1201	L'	SH	++	+	+	4!		<u> </u>	<u> </u>						2.0		D	2.5	2.0	2.0	2.0	P	2.5	
10/0001	'	<u> </u>		0.65	+			<u> </u>	<u> </u>						3.0					2.5	2.5	P	3.5	
10/1201		1		0.65	<u> </u>	\perp									3.0		D	3.0	3.0	3.0	3.0	P	4.0	
10/1201		1'					IJ	RRE	GUI	LAR	1.50		2.5+	0.5	3.0+									
11/0001						1.2									4.0		D	3.5	4.5	4.0	4.0	C	5.5	
11/0001			DG	EY	E IN	MG		MG	4.5	-0.5			4.0	0.0	4.0									
	1 - 1	\Box '																						
11/1101	$\overline{}$		GE	YE I	NL	G/W		LG	5.0 +	0.0			5.0 ⁺	0.0	5.0 ⁺		\mathbf{D}^{+}	4.5	6.0	4.5	4.5	C	6.0	
11/1101	$\sqrt{}$											LG	4.5+	0.0	4.5+									
11/1201							0.50		4.0	-0.5				1.0+	4.5+		\mathbf{D}^{+}	4.5	5.0	4.5+	4.5 ⁺	C	6.0	
11/1201						1.5									4.5									
11/1201							I	RRE	GUI	LAR	2.30		3.0	1.0+	4.0+									
12/0001			OW	EY	E IN	LG		LG	5.0	0.0	2		5.0	0.0	5.0		\mathbf{D}^{+}	5.5	5.5	5.0	5.0	P	6.0	
12/1131		$\overline{\mathbf{W}}$	1G E	YE	$\overline{\mathbf{N}}$	G/B		LG	5.0	1.0			6.0	0.0	6.0		\mathbf{D}^{+}	6.0	5.5	6.0	6.0	C	7.5	
12/1201		[]					0.90		5.5	0.0			5.5	1.0	6.5		\mathbf{D}^{+}	6.0	5.5	6.0	6.0	C	7.5	
										3														
13/0001			ow i	EYF	IN	B/W		В	5.5+	0.5			6.0+	0.5	6.5+		\mathbf{D}^{+}	6.5	6.5	6.5	6.5	\mathbf{C}	8.0	
13/1201		T'	G E	YE	IN C	\mathbf{MG}'	7	MG	6.5	0.5	***		7.0	0.5	7.5		\mathbf{D}^{+}	7.5	7.0	7.5	7.5	C	8.0	
13/1231						+	0.90		-	0.5	-		6.0	1.5			\mathbf{D}^{+}	7.5	7.0		7.5	C	8.0	

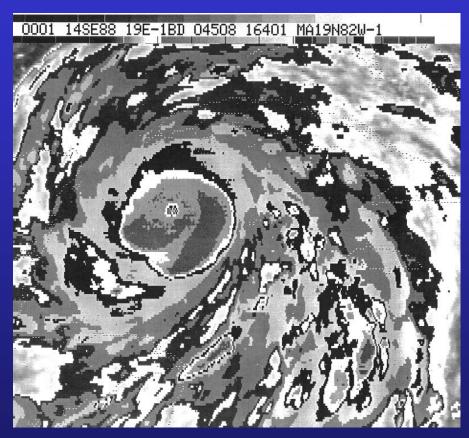
Vernon F. Dvorak May 1982		٦	r-NU FOF	MBE DA	R ES	MITS	ATE MBE	FRO R (D	M M T) C	EAS OMF	UREI PUTA	MEN.	TS 1			T-N				MAT				EL
STEP -		1		2 <i>A</i>	,B				С		2D	2E	Data	T-Nu	mber	3	4	5	6	7,8	9	1	0	
DESCRIPTION -	Loc	ation	Curve	ed Bar	nd or	Shear	Е	ye	Eno+E	_{Adj} =CF	CDO	Emb. Centr.		mputat		ccc	Trend	MET	PAT	FT	CI	24-Hr.	Fcst.	
RULES -	Locate System at focal cloud c	Cloud Center point of urvature	Use S DT 1.5	Spiral DT2.5	Arc Lo	DT 4.5		(EIR) Use Surrounding Temperature	From Rules	Eye Definition	Central SG C Dense a a a Overcast			+BF=		Cold Cover	24-Hr change eakening eakening	Model Expected T-Number	Pattern T-Number	Final Band T-Number as	ent isity ber		if nec.	INITIALS
DATE/TIME	LAT	LONG	2	2)	2)	(19)	(·)		Ε×°	EAdj		(3)	CF	BF	DT	(Q)	ဝုန္နလ္မ	M Expe	Patte T-Nc	Fina T-N	Current Intensity Number	List Rule Used	Forecast Intensity Number	
14/0001		WM	G E	YE	IN C	MG	C	MG	6.5	1.0			7.5	0.5	8.0			8.0		8.0	8.0	G?	???	
14/1201		DG	EYE	IN	W/C	MG		W	6.0	0.5	***		6.5	0.0	6.5		S	7.5	7.0	7.5	8.0	В	???	
14/1231							0.70	_		0.0			5.0		7.0		S	7.5		7.5		В	???	
11/1201							•••																	
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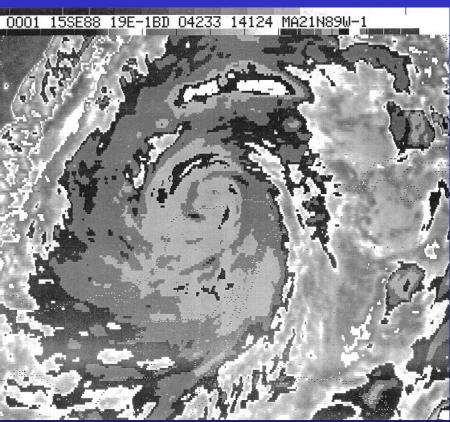
0001 UTC 15 Sep 1988



Issues for 0001 UTC 15 Sep 1988

- The hurricane has been over land for most of the last 12 hours. How does this affect the analysis? How does this affect the MET?
- Which cloud pattern could be used for measurements?

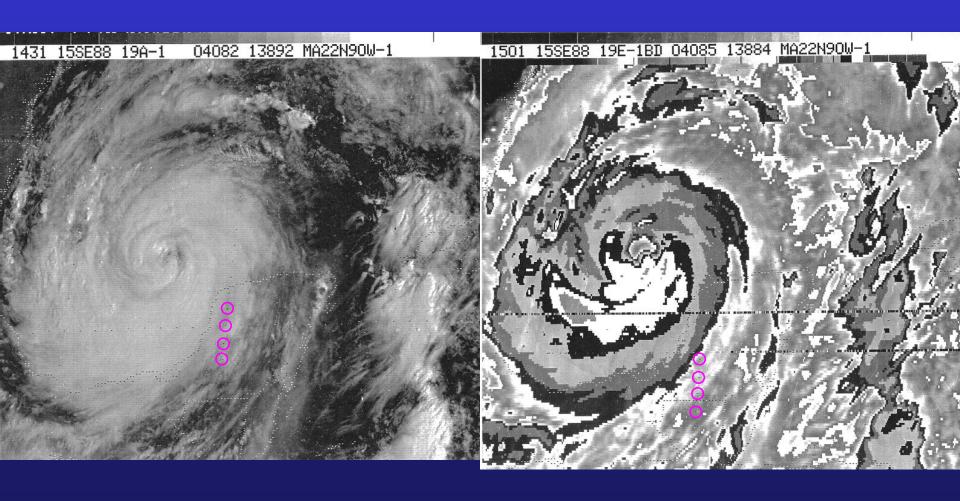




Vernon F. Dvorak May 1982			T-NUI FOR			STIMA										T-N					E FR		MOD	EL
STEP -	,	1			A,B				C		2D	2E		T-Nur	mber	3	4	5	6	7,8	9		0	
DESCRIPTION -	Loc	ation	Curve	ed Ban	nd or	Shear	E.	ye	ENo+EA	_{Adj} =CF	CDO	Emb. Centr.		nputat		ССС	Trend	MET	PAT	FT	СІ	24-Hr.	Fcst.	
RULES -	Locate (System at focal cloud cu	Cloud Center point of urvature	DT 1.5	Spiral /	Arc Le	ngth DT4.5	VIS) Use imbedded Distance	(EIR) Use Surrounding Temperature	From Rules	Eye Definition	Central S.C. Noense a a Overcast	(EIR) Use Surrounding Temperature	CF	+BF=(TΟ	Cover self	24-Hr change buide	J.	er -	Use Rules			if nec.	INITIALS
DATE/TIME	LAT	LONG	$ \cap $	\mathcal{D}	2	9	(·)	100	Eno	1		(i)	CF	BF				Model Expected T-Number	Pattern T-Numbe	Final T-Number	Current Intensity Number			Z Z
08/1301	'			0.4											2.5		D	1.0	2.0	1.5	1.5	P	2.5	
08/2301	<u> </u>		NO		+	E R	<u>ULF</u>	LS_									D	1.5	1.5	1.5	1.5	P	2.5	
09/1201	L'	SH	++	+	+	4!		<u> </u>	<u> </u>						2.0		D	2.5	2.0	2.0	2.0	P	2.5	
10/0001	'	<u> </u>		0.65	+			<u> </u>	<u> </u>						3.0					2.5	2.5	P	3.5	
10/1201		1		0.65	<u> </u>	\perp									3.0		D	3.0	3.0	3.0	3.0	P	4.0	
10/1201		1'					IJ	RRE	GUI	LAR	1.50		2.5+	0.5	3.0+									
11/0001						1.2									4.0		D	3.5	4.5	4.0	4.0	C	5.5	
11/0001			DG	EY	E IN	MG		MG	4.5	-0.5			4.0	0.0	4.0									
	1 - 1	\Box '																						
11/1101	$\overline{}$		GE	YE I	NL	G/W		LG	5.0 ⁺	0.0			5.0 ⁺	0.0	5.0 ⁺		\mathbf{D}^{+}	4.5	6.0	4.5	4.5	C	6.0	
11/1101	$\sqrt{}$											LG	4.5+	0.0	4.5+									
11/1201							0.50		4.0	-0.5				1.0+	4.5+		\mathbf{D}^{+}	4.5	5.0	4.5+	4.5 ⁺	C	6.0	
11/1201						1.5									4.5									
11/1201							I	RRE	GUI	LAR	2.30		3.0	1.0+	4.0+									
12/0001			OW	EY	E IN	LG		LG	5.0	0.0	2		5.0	0.0	5.0		\mathbf{D}^{+}	5.5	5.5	5.0	5.0	P	6.0	
12/1131		$\overline{\mathbf{W}}$	1G E	YE	$\overline{\mathbf{N}}$	G/B		LG	5.0	1.0			6.0	0.0	6.0		\mathbf{D}^{+}	6.0	5.5	6.0	6.0	C	7.5	
12/1201		[]					0.90		5.5	0.0			5.5	1.0	6.5		\mathbf{D}^{+}	6.0	5.5	6.0	6.0	C	7.5	
										3														
13/0001			ow i	EYF	IN	B/W		В	5.5+	0.5			6.0+	0.5	6.5+		\mathbf{D}^{+}	6.5	6.5	6.5	6.5	\mathbf{C}	8.0	
13/1201		T'	G E	YE	IN C	\mathbf{MG}'	7	MG	6.5	0.5	***		7.0	0.5	7.5		\mathbf{D}^{+}	7.5	7.0	7.5	7.5	C	8.0	
13/1231						+	0.90		-	0.5	-		6.0	1.5			\mathbf{D}^{+}	7.5	7.0		7.5	C	8.0	

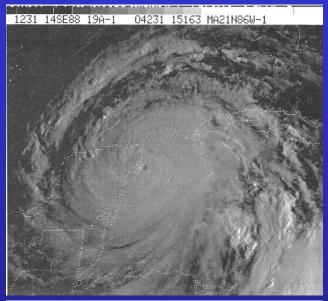
Vernon F. Dvorak May 1982			-NU FOF		R ES	MIT	ATE	FRO		EAS	URE					T-N				MAT				EL
STEP -		1		2A	,В			2	С		2D	2E	Data	T-Nu	mber	3	4	5	6	7,8	9	1	0	
DESCRIPTION -	Loc	ation		ed Bar			E	ye	Eno+E	Adj=CF	CDO	Emb. Centr.	Cor	nputat	ion	ccc	Trend	MET	PAT	FT	СІ	24-Hr.	Fcst.	
RULES	Locate System at focal cloud co	Cloud Center point of urvature LONG	DT 1.5	Spiral DT 2.5	Arc Le	ength DT 4.5	(VIS) Use Embedded Distance	m	From S Rules	Eye Definition	Central SC Oense as a Overcast	(EIR) Use Surrounding Temperature		BF		Rules	O-developing 45 W-weakening B-3-Same	Model Expected T-Number	Pattern T-Number	Final BC T-Number 8 9	Current Intensity Number	List Rule Used		INITIALS
14/0001	LAI		G E	VF		MC		MG			- ω			0.5	8.0	-		8.0		8.0	8.0		???	
14/0001		V V 1V	GE			1110		MG	0.5	1.0			7.5	0.5	0.0		D	0.0	7.5	0.0	0.0	J.	•••	
14/1201		DG	EYE	IN	W/C	MG		W	6.0	0.5	***		6.5	0.0	6.5		S	7.5	7.0	7.5	8.0	В	???	
14/1231							0.70			0.0			5.0				S	7.5	7.0			В	???	
15/0001												LG	4.5	0.0	4.5		W	5.5	5.0	5.5	6.5	D	7.5	
15/0001						1.2									4.0									
																				·				
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						7								-										
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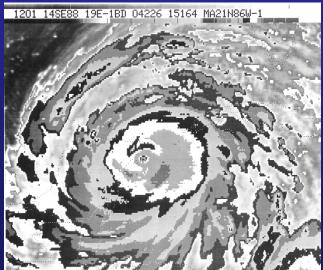
1431/1501 UTC 15 Sep 1988



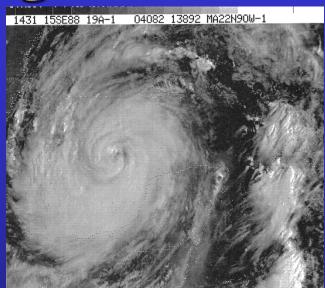
Issues for 1431/1501 UTC 15 Sep 1988

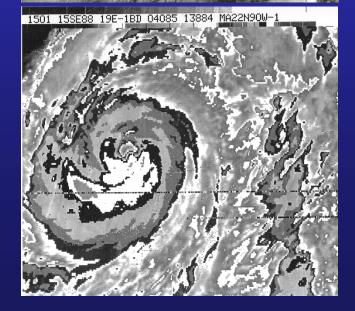
- How has the storm changed in the last 24 hours? Is there any change in development trend?
- What cloud patterns could be used for measurements? Which one might be the best?
- Can IR banding be used here?







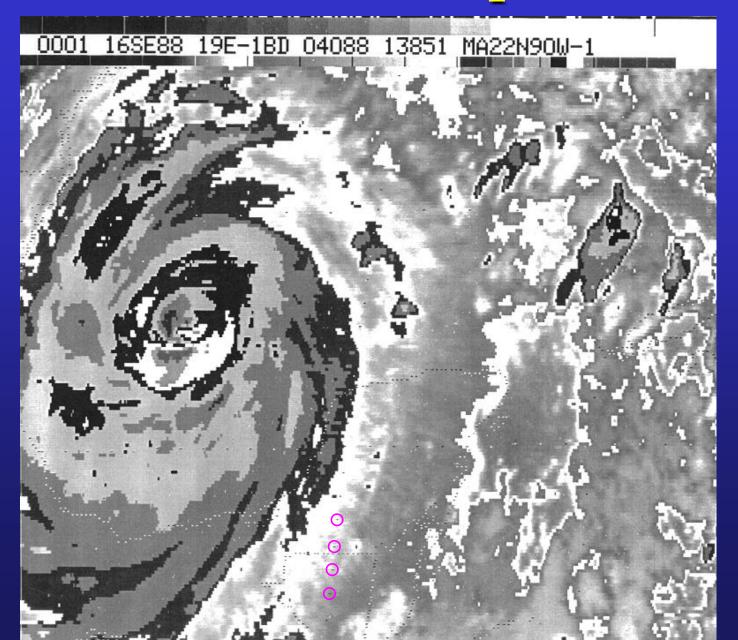




Vernon F. Dvorak May 1982			T-NUI FOR			STIMA										T-N					E FR		MOD	EL
STEP -	,	1			A,B				C		2D	2E		T-Nur	mber	3	4	5	6	7,8	9		0	
DESCRIPTION -	Loc	ation	Curve	ed Ban	nd or	Shear	E.	ye	ENo+EA	_{Adj} =CF	CDO	Emb. Centr.		nputat		ССС	Trend	MET	PAT	FT	СІ	24-Hr.	Fcst.	
RULES -	Locate (System at focal cloud cu	Cloud Center point of urvature	DT 1.5	Spiral /	Arc Le	ngth DT4.5	VIS) Use imbedded Distance	(EIR) Use Surrounding Temperature	From Rules	Eye Definition	Central S.C. Noense a a Overcast	(EIR) Use Surrounding Temperature	CF	+BF=(TΟ	Cover self	24-Hr change buide	J.	er -	Use Rules			if nec.	INITIALS
DATE/TIME	LAT	LONG	$ \cap $	\mathcal{D}	2	9	(·)	100	Eno	1		(i)	CF	BF				Model Expected T-Number	Pattern T-Numbe	Final T-Number	Current Intensity Number			Z Z
08/1301	'			0.4											2.5		D	1.0	2.0	1.5	1.5	P	2.5	
08/2301	<u> </u>		NO		+	E R	<u>ULF</u>	LS_									D	1.5	1.5	1.5	1.5	P	2.5	
09/1201	L'	SH	++	+	+	4!		<u> </u>	<u> </u>						2.0		D	2.5	2.0	2.0	2.0	P	2.5	
10/0001	'	<u> </u>		0.65	+			<u> </u>	<u> </u>						3.0					2.5	2.5	P	3.5	
10/1201		1		0.65	'	\perp									3.0		D	3.0	3.0	3.0	3.0	P	4.0	
10/1201		1'					IJ	RRE	GUI	LAR	1.50		2.5+	0.5	3.0+									
11/0001						1.2									4.0		D	3.5	4.5	4.0	4.0	C	5.5	
11/0001			DG	EY	E IN	MG		MG	4.5	-0.5			4.0	0.0	4.0									
	1 - 1	\Box '																						
11/1101	$\overline{}$		GE	YE I	NL	G/W		LG	5.0 ⁺	0.0			5.0 ⁺	0.0	5.0 ⁺		\mathbf{D}^{+}	4.5	6.0	4.5	4.5	C	6.0	
11/1101	$\sqrt{}$											LG	4.5+	0.0	4.5+									
11/1201							0.50		4.0	-0.5				1.0+	4.5+		\mathbf{D}^{+}	4.5	5.0	4.5+	4.5 ⁺	C	6.0	
11/1201						1.5									4.5									
11/1201							I	RRE	GUI	LAR	2.30		3.0	1.0+	4.0+									
12/0001			OW	EY	E IN	LG		LG	5.0	0.0	2		5.0	0.0	5.0		\mathbf{D}^{+}	5.5	5.5	5.0	5.0	P	6.0	
12/1131		$\overline{\mathbf{W}}$	1G E	YE	$\overline{\mathbf{N}}$	G/B		LG	5.0	1.0			6.0	0.0	6.0		\mathbf{D}^{+}	6.0	5.5	6.0	6.0	C	7.5	
12/1201		[]					0.90		5.5	0.0			5.5	1.0	6.5		\mathbf{D}^{+}	6.0	5.5	6.0	6.0	C	7.5	
										3														
13/0001			ow i	EYF	IN	B/W		В	5.5+	0.5			6.0+	0.5	6.5+		\mathbf{D}^{+}	6.5	6.5	6.5	6.5	\mathbf{C}	8.0	
13/1201		T'	G E	YE	IN C	\mathbf{MG}'	7	MG	6.5	0.5	***		7.0	0.5	7.5		D +	7.5	7.0	7.5	7.5	C	8.0	
13/1231						+	0.90		-	0.5	-		6.0	1.5			\mathbf{D}^{+}	7.5	7.0		7.5	C	8.0	

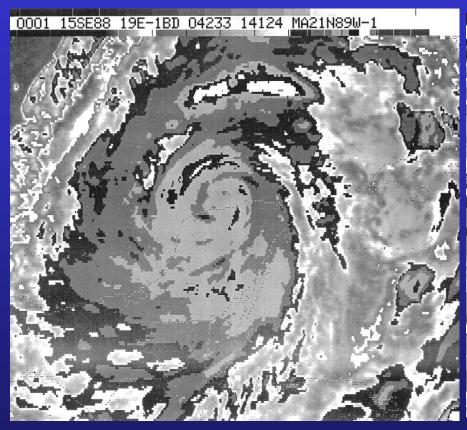
Vernon F. Dvorak May 1982		1			R ES											T-N					E FR		MOD S	EL
STEP →		1		2 <i>A</i>	A,B			2	С		2D	2E	Data	T-Nu	mber	3	4	5	6	7,8	9	1	0	
DESCRIPTION →	Loc	ation	Curve	ed Bar	nd or s	Shear	E	ye	Eno+E	_{Adj} =CF	CDO	Emb. Centr.		nputat		ccc	Trend	MET	PAT	FT	CI	24-Hr.	. Fcst.	
RULES -	Locate System at focal cloud c	Cloud Center point of urvature	Use S	Spiral DT 2.5	Arc Le	ength DT4.5	(VIS) Use Embedded Distance	(EIR) Use Surrounding Temperature	From Rules	Eye Definition	Central SC Dense a so Overcast	(EIR) Use Surrounding Temperature	CF	+BF=(DT	Rules	D-developing W-weakening P-3-8	ted nber	n nber -	Use Rules	nt nty er		if nec.	INITIALS
DATE/TIME	LAT	LONG		2)	(2)	(ك	0		Eno	Eadj	(Z)	(3)	CF	BF	DT	0	D-dev W-wei	Model Expect T-Nur	Pattern T-Numbe	Final T-Number	Current Intensity Number	List Rule Used	Forecast Intensity Number	ᅙ
14/0001		WM	G E	YE	IN C	MG	C	MG					7.5	0.5	8.0			8.0		8.0	8.0			
14/1201		DG	EYE	IN	W/C	MG		W	6.0	0.5	**		6.5	0.0	6.5		S	7.5	7.0	7.5	8.0	В	???	
14/1231							0.70		5.0	0.0			5.0	2.0	7.0		S	7.5	7.0	7.5	8.0	B	???	
15/0001												LG	4.5	0.0	4.5		W	5.5	5.0	5.5	6.5	D	7.5	
15/0001						1.2									4.0									
							,													,				
15/1431						1.6									4.5		W	4.5	4.5	4.5	5.5	D	6.5	
15/1431							0.5			-0.5			3.5	1.5	5.0									
15/1500			<u>ow</u>	EY	E IN	MG		MG	4.5	0.0			4.5	0.0	4.5		W	4.5	4.5	4.5	5.5	D	6.5	
									,															
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	L			L	L	L	L	l		L		L	L	L	L				l	L	L	L		

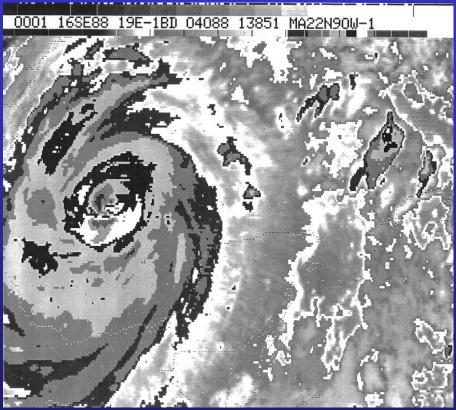
0001 UTC 16 Sep 1988



Issues for 0001 UTC 16 Sep 1988

- How has the storm changed in the last 24 hours? Is there any change in development trend?
- What cloud patterns could be used for measurements? Which one might be the best?

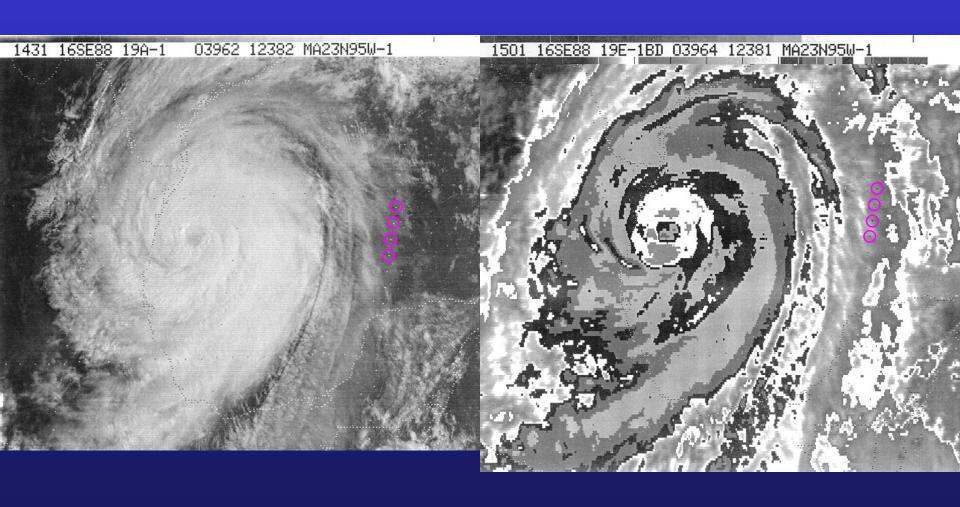




Vernon F. Dvorak May 1982			T-NUI FOR			STIMA										T-N					E FR		MOD	EL
STEP -	,	1			A,B				C		2D	2E		T-Nur	mber	3	4	5	6	7,8	9		0	
DESCRIPTION -	Loc	ation	Curve	ed Ban	nd or	Shear	E.	ye	ENo+EA	_{Adj} =CF	CDO	Emb. Centr.		nputat		ССС	Trend	MET	PAT	FT	СІ	24-Hr.	Fcst.	
RULES -	Locate (System at focal cloud cu	Cloud Center point of urvature	DT 1.5	Spiral /	Arc Le	ngth DT4.5	VIS) Use imbedded Distance	(EIR) Use Surrounding Temperature	From Rules	Eye Definition	Central S.C. Noense a a Overcast	(EIR) Use Surrounding Temperature	CF	+BF=(TΟ	Cover self	24-Hr change buide	J.	er -	Use Rules			if nec.	INITIALS
DATE/TIME	LAT	LONG	$ \cap $	\mathcal{D}	2	9	(·)	100	Eno	1		(i)	CF	BF				Model Expected T-Number	Pattern T-Numbe	Final T-Number	Current Intensity Number			Z Z
08/1301	'			0.4											2.5		D	1.0	2.0	1.5	1.5	P	2.5	
08/2301	<u> </u>		NO		+	E R	<u>ULF</u>	<u>S</u>									D	1.5	1.5	1.5	1.5	P	2.5	
09/1201	L'	SH	++	+	+	4!		<u> </u>	<u> </u>						2.0		D	2.5	2.0	2.0	2.0	P	2.5	
10/0001	'	<u> </u>		0.65	+			<u> </u>	<u> </u>						3.0					2.5	2.5	P	3.5	
10/1201		1		0.65	<u> </u>	\perp									3.0		D	3.0	3.0	3.0	3.0	P	4.0	
10/1201		1'					IJ	RRE	GUI	LAR	1.50		2.5+	0.5	3.0+									
11/0001						1.2									4.0		D	3.5	4.5	4.0	4.0	C	5.5	
11/0001			DG	EY	E IN	MG		MG	4.5	-0.5			4.0	0.0	4.0									
	1 - 1	\Box '																						
11/1101	$\overline{}$		GE	YE I	NL	G/W		LG	5.0 +	0.0			5.0 ⁺	0.0	5.0 ⁺		\mathbf{D}^{+}	4.5	6.0	4.5	4.5	C	6.0	
11/1101	$\sqrt{}$											LG	4.5+	0.0	4.5+									
11/1201							0.50		4.0	-0.5				1.0+	4.5+		\mathbf{D}^{+}	4.5	5.0	4.5+	4.5 ⁺	C	6.0	
11/1201						1.5									4.5									
11/1201							I	RRE	GUI	LAR	2.30		3.0	1.0+	4.0+									
12/0001			OW	EY	E IN	LG		LG	5.0	0.0	2		5.0	0.0	5.0		\mathbf{D}^{+}	5.5	5.5	5.0	5.0	P	6.0	
12/1131		$\overline{\mathbf{W}}$	1G E	YE	$\overline{\mathbf{N}}$	G/B		LG	5.0	1.0			6.0	0.0	6.0		\mathbf{D}^{+}	6.0	5.5	6.0	6.0	C	7.5	
12/1201		[]					0.90		5.5	0.0			5.5	1.0	6.5		\mathbf{D}^{+}	6.0	5.5	6.0	6.0	C	7.5	
										3														
13/0001			ow i	EYF	IN	B/W		В	5.5+	0.5			6.0+	0.5	6.5+		\mathbf{D}^{+}	6.5	6.5	6.5	6.5	\mathbf{C}	8.0	
13/1201		T'	G E	YE	IN C	\mathbf{MG}'	7	MG	6.5	0.5	***		7.0	0.5	7.5		\mathbf{D}^{+}	7.5	7.0	7.5	7.5	C	8.0	
13/1231						+	0.90		-	0.5	-		6.0	1.5			\mathbf{D}^{+}	7.5	7.0		7.5	C	8.0	

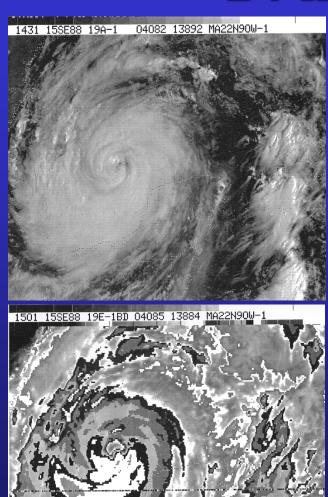
Vernon F. Dvorak May 1982		Т			R ES											T-N					E FR		MOD S	EL
STEP -		1		2A	,В			2	С		2D	2E	Data	T-Nu	mber	3	4	5	6	7,8	9	1	0	
DESCRIPTION →	Loc	ation	Curve	ed Bar	nd or S	Shear	E	ye	Eno+E	Adj=CF	CDO	Emb. Centr.	Cor	nputat	ion	ccc	Trend	MET	PAT	FT	CI	24-Hr	. Fcst.	
RULES -	Locate System				Arc Le		e 9d	e Jing ture			Use Size	e ding ture	CF	+BF=	DT	Use Rules	24-Hr change			Use Rules			Model if nec.	S)
	at focal	point of	6/	9	010.5	014.5	(VIS) Use Embedded Distance	(EIR) Use Surrounding Temperature	From	Eye Definition	Central Dense Overcast	(EIR) Use Surrounding Temperature				Cold Cover	guic							₹│
	Clodd Cl	l	5	\approx	5						550					± 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	evelop veaker ame	Model Expected T-Number	Pattern T-Number	Final T-Number	Current Intensity Number	a. P	Forecast Intensity Number	INITIALS
DATE/TIME	LAT	LONG		2)	2)	<u>(B</u>	(•)		Eno	Eadj	(2)	(9)		BF		0	ပ္ခန့်လ္မှိ					List Rule Used		
14/0001		WM	G E	YE	IN C	MG	C	MG	6.5	1.0			7.5	0.5	8.0		\mathbf{D}^{+}	8.0	7.5	8.0	8.0	G?	???	
																					L		\sqcup	
14/1201		DG	EYE	IN	W/C			W		0.5	**	-		0.0			S	7.5	7.0			В	???	
14/1231							0.7 °		5.0	0.0			5.0	2.0	7.0		S	7.5	7.0	7.5	8.0	B	???	
		1															<u> </u>			<u> </u>			<u> </u>	
15/0001												LG	4.5	0.0	_		W	5.5	5.0	5.5	6.5	D	7.5	
15/0001						1.2									4.0						ļ		\sqcup	
							,										ļ				ļ		\sqcup	
15/1431						1.6									4.5		W	4.5	4.5	4.5	5.5	D	6.5	
15/1431							0.50			-0.5					5.0		ļ			<u> </u>			\vdash	
15/1500			<u>ow</u>	EYI	EIN	MG		MG	4.5	0.0			4.5	0.0	4.5		W	4.5	4.5	4.5	5.5	D	6.5	
1.510.001			~ _			~ -			- 0	0.0			- 0	0.0			<u> </u>			 			000	
16/0001		<u>D</u>	G E	YE.	NL	G/B		LG	5.0 ⁺	0.0			<u>5.0</u> ⁺	0.0	5.0+		D	6.5	5.5	5.5	5.5	B	???	
																				ļ	 			
																	ļ				ļ			
														-						-	-		\vdash	
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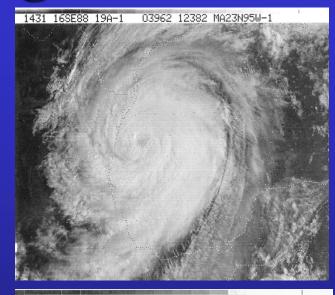
1431/1501 UTC 16 Sep 1988

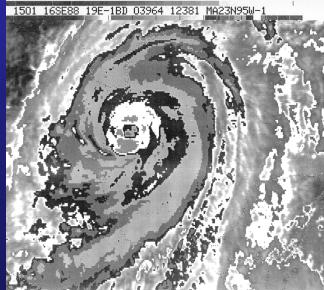


Issues for 1431/1501 UTC 16 Sep 1988

- How has the storm changed in the last 24 hours? Is there any change in development rate or trend?
- What cloud patterns could be used for measurements? Which one might be the best?







Vernon F. Dvorak May 1982	T-NUMBER ESTIMATE FROM MEASUREMENTS FOR DATA T-NUMBER (DT) COMPUTATION													T-N	T-NUMBER ESTIMATE FROM MOI AND DT CONSTRAINTS							EL		
STEP -		1	2A,B				2C				2D	2E	Data T-Number			3	4	5	6	7,8	9	1	0	
DESCRIPTION -	Location		Curved Band or			Shear Eye		ye	ENo+EAdj=CF		CDO	Emb. Centr.	Computation		ccc	Trend	MET	PAT	FT	СІ	24-Hr.	. Fcst.		
RULES -	Locate Cloud System Center at focal point of cloud curvature		Use S DT 1.5	Spiral DT 2.5	Arc Length DT3.5 DT4.5		(VIS) Use Embedded Distance (EIR) Use Surrounding		From Rules Eye Definition		Central S Noense a s Overcast	(EIR) Use Surrounding Temperature	CF+BF=DT		Cover sold Sover	24-Hr change buido	id Jer	oer -	Use Rules			if nec.	INITIALS	
DATE/TIME	LAT	LONG	2	2)	2	9	\bigcirc	m	Eno			0	ı	BF		0			Pattern T-Numbe		Current Intensity Number			Ž
08/1301				0.4											2.5		D	1.0	2.0	1.5	1.5	P	2.5	
08/2301			NO	_		ER	ULE										D	1.5	1.5	1.5	1.5	P	2.5	
09/1201		SH	EAR												2.0		D	2.5	2.0	2.0	2.0	P	2.5	
10/0001				0.65											3.0		D	2.5	3.0	2.5	2.5	P	3.5	
10/1201				0.65											3.0		D	3.0	3.0	3.0	3.0	P	4.0	
10/1201							I	RRE	<u>GUI</u>	<u>LAR</u>	1.50		2.5+	0.5	3.0+						\vdash		\vdash	
															-			2.5	4 -	4.0			 	
11/0001						1.2	-								4.0		D	3.5	4.5	4.0	4.0	C	5.5	
11/0001			DG	EYI	<u>CIN</u>	MG		MG	4.5	-0.5			4.0	0.0	4.0					-	\vdash			
																			-					
11/1101		L	GE'	YE I	N L	G/W		LG	5.0 ⁺	0.0			5.0 ⁺		5.0 ⁺		\mathbf{D}^{+}	4.5	6.0	4.5	4.5	P	6.0	
11/1101												LG	4.5+	0.0										
11/1201						_	0.50		4.0	-0.5			3.5	1.0 +			\mathbf{D}^{+}	4.5	5.0	4.5+	4.5+	P	6.0	
11/1201						1.5									4.5								\vdash	
11/1201							I	RRE	<u>GUI</u>	<u>LAR</u>	2.30		3.0	1.0 +	4.0+						\vdash		\vdash	
1210001						- ~		T 0	7 0	0.0				0.0	-		-			-	-			
12/0001			<u>lOW</u>	EY	EIN	LG		LG	5.0	0.0			5.0	0.0	5.0		\mathbf{D}^{+}	5.5	5.5	5.0	5.0	P	6.0	
10/1101		****	C	777		C /D		TO	5 0	1.0			(0	0.0	(0		D±	(0						
12/1131		W M	G E	YE	IN L	G/B		LG		1.0				0.0			D+		5.5		6.0		7.5	
12/1201			-	-			0.90		5.5	0.0			5.5	1.0	0.5		D +	6.0	5.5	6.0	6.0	P	7.5	
12/0001			NX7 :		TNI	D /X X 7		D		0.5	-		(0	0.5	(=		D±	65	(F	(5-	(5	D	0.0	
13/0001			<u>ייע</u>	EYE	IIN	B/W		В	5.5 ⁺	<u>U.5</u>	-	-	0.0	U.5	6.5+		\mathbf{D}^{+}	6.5	6.5	0.5	6.5	P	8.0	
12/1201			CE	717 1					<i>(=</i>	0.5	***	-	7.0	0.5	7.5		D +	7 5	7.0	7.5	75	P	0 A	-
13/1201			G E	YE]	IN C	MG		MG	0.5	0.5	***	-	7.0		7.5			7.5			7.5		8.0	
13/1231	L				L		0.90		3.5	0.5	***		6.0	1.5	7.5		D ⁺	7.5	7.0	/.5	7.5	<u> </u>	8.0	

Vernon F. Dvorak May 1982	T-NUMBER ESTIMATE FROM MEASUREMENTS FOR DATA T-NUMBER (DT) COMPUTATION												T-NUMBER ESTIMATE FROM MODEL AND DT CONSTRAINTS											
STEP -	1	2A,B				2C				2D	2E	Data T-Number			3	4	5	6	7,8	9		0		
DESCRIPTION -	Location		Curved Band or Shear				Eye E _{No} +			_{Adj} =CF	CDO	Emb. Centr.	Computation		ccc	Trend	MET	PAT	FT	CI		24-Hr. Fcst.		
RULES	Locate Cloud System Center at focal point of cloud curvature				piral Arc Le DT2.5 DT3.5 I		(VIS) Use Embedded Distance	(EIR) Use Surrounding Temperature	From Rules	Eye Definition	Use Size	se ding ature	CF+BF=DT		Use Rules	24-Hr change			Use Rules		Adj. Model Fcst. if nec.		S	
			6/)	9							Central Dense Overcast	(EIR) Use Surrounding Temperature					guin	Ĺ			İ			INITIALS
			\mathcal{L}	5	5	(B)	(0)	m		1		(5)	<u> С</u> Е	0-	Γ	Cold Cover	D-developing W-weakening S-same	Model Expected T-Number	Pattern T-Number	Final T-Number	Current Intensity Number	- = B	Forecast Intensity Number	늘
DATE/TIME	LAT	LONG		4	2	\sim	\sim			EAdj	(D)	0		BF								List Rule Used		
14/0001		WM	G E	YE.	IN C	MG	U	MG	6.5	1.0	-		7.5	0.5	8.0		\mathbf{D}^{+}	8.0	7.5	8.0	8.0	G?	???	
14/1201		DG		INI		MC		W	6.0	0.5	:**		6.5	0.0	6.5		S	7.5	7.0	7.5	8.0	В	???	\vdash
14/1201		DG		111	VV/C	MG	0.7°			0.0							S	7.5	7.0			В	???	
14/1431							U. 1		2.0	0.0			2.0	∠. ∪	7.0		5	1.5	7.0	1.3	0.0	<u> </u>	-	
15/0001					,							LG	4.5	0.0	4.5		W	5.5	5.0	5.5	6.5	D	7.5	
15/0001						1.2									4.0									
							-																	
15/1431						1.6									4.5		W	4.5	4.5	4.5	5.5	D	6.5	
15/1431							0.50		4.0	-0.5			3.5	1.5	5.0									
15/1500			<u>ow</u>	EYI	E IN	MG		MG	4.5	0.0			4.5	0.0	4.5		W	4.5	4.5	4.5	5.5	D	6.5	
								- ~		0.0				0.0					 	<u> </u>			222	
16/0001			G E	YE I	NL	G/B		LG	5.0+	0.0			5.0+	0.0	5.0+	ļ	D	6.5	5.5	5.5	5.5	B	???	\vdash
16/1401							0.75		- 0	1.0			4.0	1 5+	5 5 +		<u> </u>	<i>5 5</i>	60	60	60	D	222	\vdash
16/1431 16/1501			NA	7 177	ΈII	T XX 7	0.75	W		-1.0				1.5+			D	5.5 5.5		6.0 6.0		B	??? ???	
10/1501			141	J L 1		VV		▼ ▼	6.0	0.0			U.U	0.0	6.0		<u> </u>	٠.٥	0.0	0.0	0.0	D	• • •	\vdash
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What storm was this?

Hurricane Gilbert, September 1988