

Tropical Cyclone Report  
Hurricane Jova  
12-25 September 2005

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27 February 2006

Hurricane Jova was a long-lived hurricane that reached category 3 status (on the Saffir-Simpson Hurricane Scale) and remained over the open waters of the eastern North Pacific and central North Pacific Ocean basins. It dissipated well north of the Hawaiian Islands.

a. Synoptic History

The vigorous tropical wave that eventually spawned Hurricane Jova moved off the western coast of Africa on 28 August. A well-defined low pressure system formed along the northern portion of the wave by 30 August about 500 n mi west-southwest of the Cape Verde Islands. That system broke away and moved northwestward and eventually became major (Category 3-5) Atlantic Hurricane Maria. The innocuous southern portion of the wave moved rapidly westward for the next five days and emerged over the extreme eastern North Pacific Ocean on 4 September. By 7 September, QuikSCAT wind data indicated a broad surface low pressure area had developed along the wave axis, and associated thunderstorm activity had increased about 400 n mi south of Acapulco, Mexico. The low pressure area moved west-northwestward at about 10 kt for the next 3-4 days accompanied by little change in organization. By late on 11 September, however, a burst of deep convection near the surface low pressure center increased the organization enough for the system to be classified as a tropical depression at 0000 UTC 12 September about 550 n mi south-southwest of the southern tip of Baja California, Mexico. The “best track” chart of the tropical cyclone’s path is given in Fig. 1, with the wind and pressure histories shown in Figs. 2 and 3, respectively. The best track positions and intensities are listed in Table 1.

The depression moved generally westward for the next three days while under the influence of moderate easterly wind shear. This unfavorable vertical shear severely inhibited the strengthening process and the cyclone did not become a tropical storm until 0000 UTC 15 September. Tropical Storm Jova then moved in an uncharacteristic west-southwestward direction and also intensified at a much faster rate, becoming a hurricane at 0600 UTC 16 September about 1475 n mi west-southwest of Baja California. After reaching hurricane strength, Jova experienced several minor intensity fluctuations but generally strengthened over the following four days and became a major hurricane on 18 September as it was crossing 140° W longitude and into the central North Pacific Ocean basin. After moving into the Central Pacific Hurricane Center’s area of responsibility, Jova made a sharp northwestward turn as the cyclone moved toward a large weakness in the subtropical ridge located to the northwest of the cyclone. The hurricane reached its peak intensity of 110 kt at 0000 UTC 20 September about 700 n mi east-southeast of Hilo, Hawaii. Gradual weakening began shortly thereafter as the cyclone moved over decreasing sea-surface temperatures. The long trajectory over the gradually lower sea-

surface temperatures steadily took its toll on Jova and the cyclone rapidly weakened to a tropical storm late on 22 September about 350 n mi east-northeast of Hilo. Jova became a tropical depression 24 h later and the remnant circulation dissipated about 260 n mi north of Hilo, Hawaii by 0600 UTC 25 September.

b. Meteorological Statistics

Observations in Hurricane Jova (Figs. 2 and 3) include satellite-based Dvorak technique intensity estimates from the Tropical Analysis and Forecast Branch (TAFB), the Satellite Analysis Branch (SAB) and the U. S. Air Force Weather Agency (AFWA). Microwave satellite imagery from NOAA polar-orbiting satellites, the NASA Tropical Rainfall Measuring Mission (TRMM), the NASA QuikSCAT, and Defense Meteorological Satellite Program (DMSP) satellites were also useful in tracking Jova.

Jova's peak intensity of 110 kt at 0000 UTC 20 Sep 2005 is based on a blend of 3-h average Advanced Objective Dvorak Technique (ODT) T-numbers and the subjective T-numbers from the various satellite agencies. This intensity also fit the best appearance and smallest diameter of the eye in microwave satellite imagery (Fig. 4).

No ship or land-based reports of winds of tropical storm-force associated with Hurricane Jova were received.

c. Casualty and Damage Statistics

There were no reports of damages or casualties associated with Hurricane Jova.

d. Forecast and Warning Critique

Average NHC official (OFCL) track errors (with the number of cases in parentheses) for Jova in the eastern North Pacific basin were 34 (26), 51 (26), 64 (26), 84 (26), 104 (26), 125 (26), and 145 (26) n mi for the 12, 24, 36, 48, 72, 96, and 120 h forecasts, respectively. These errors are considerably lower than the average official track errors for the 10-yr period 1995-2004<sup>1</sup> [(37, 68, 97, 123, 175, 208, and 259 n mi, respectively), (Table 4)] at all forecast times, especially in the later forecast periods. The largest OFCL errors generally occurred during the first few forecasts as the climatological west-southwestward motion was not anticipated.

Average official intensity errors were 5, 8, 12, 15, 23, 32, and 34 kt for the 12, 24, 36, 48, 72, 96, and 120 h forecasts, respectively. For comparison, the average official intensity errors over the 10-yr period 1995-2004 are 6, 11, 14, 17, 19, 18, and 19 kt, respectively. The larger than average intensity errors at 72-120 h were the result of underforecasts by as much 55 kt. The effects of lower sea-surface temperatures and slightly unfavorable wind shear did not materialize as expected. The Statistical Hurricane Intensity Prediction Scheme (SHIPS) intensity model had

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<sup>1</sup> Errors given for the 96 and 120 h periods are averages over the four-year period 2001-4.

many large underforecasts similar to OFCL in the later time periods. The usually robust GFDL model also had several underforecasts, but not as many nor as large as the OFCL forecasts.

No tropical cyclone watches or warnings were required.

Table 1. Best track for Hurricane Jova, 12-25 September 2005.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
12 / 0000	14.8	114.5	1008	30	tropical depression
12 / 0600	14.8	115.6	1008	30	"
12 / 1200	14.8	116.6	1008	30	"
12 / 1800	14.8	117.8	1008	30	"
13 / 0000	14.8	118.8	1008	30	"
13 / 0600	14.5	119.7	1008	30	"
13 / 1200	14.3	120.7	1008	30	"
13 / 1800	14.3	122.0	1007	30	"
14 / 0000	14.2	123.4	1007	30	"
14 / 0600	14.1	124.6	1007	30	"
14 / 1200	13.9	125.6	1007	30	"
14 / 1800	13.8	126.5	1007	30	"
15 / 0000	13.8	127.6	1006	35	tropical storm
15 / 0600	13.8	128.6	1004	40	"
15 / 1200	13.5	130.1	1000	45	"
15 / 1800	13.1	131.5	994	55	"
16 / 0000	13.0	132.7	990	60	"
16 / 0600	12.9	133.6	987	65	hurricane
16 / 1200	12.6	134.6	983	70	"
16 / 1800	12.4	135.7	979	75	"
17 / 0000	12.3	136.4	977	80	"
17 / 0600	12.2	137.2	974	85	"
17 / 1200	12.2	138.1	973	85	"
17 / 1800	12.5	138.6	973	85	"
18 / 0000	12.9	139.3	973	85	"
18 / 0600	13.2	139.8	973	85	"
18 / 1200	13.5	140.2	970	90	"
18 / 1800	13.8	140.6	970	90	"
19 / 0000	14.2	141.1	969	90	"
19 / 0600	14.7	141.7	965	95	"
19 / 1200	15.2	142.2	960	100	"
19 / 1800	15.6	142.7	955	105	"
20 / 0000	16.0	143.3	951	110	"
20 / 0600	16.2	143.9	952	110	"
20 / 1200	16.4	144.6	955	105	"
20 / 1800	16.5	145.1	956	105	"
21 / 0000	16.7	145.7	957	105	"
21 / 0600	17.0	146.2	958	105	"
21 / 1200	17.3	146.6	961	100	"
21 / 1800	17.7	147.0	962	100	"

22 / 0000	18.1	147.3	965	95	"
22 / 0600	18.7	147.6	970	90	"
22 / 1200	19.4	147.9	976	80	"
22 / 1800	20.1	148.5	982	70	"
23 / 0000	20.8	149.1	989	60	tropical storm
23 / 0600	21.4	149.6	995	55	"
23 / 1200	21.9	150.0	1000	45	"
23 / 1800	22.3	150.4	1005	35	"
24 / 0000	22.8	151.1	1010	30	tropical depression
24 / 0600	23.0	152.1	1010	30	"
24 / 1200	23.1	153.0	1014	25	"
24 / 1800	23.3	153.8	1014	25	"
25 / 0000	23.7	154.6	1015	20	"
25 / 0600					dissipated
20 / 0000	16.0	143.3	951	110	minimum pressure

Table 2. Preliminary forecast evaluation (heterogeneous sample) for Hurricane Jova, 12-25 September 2005. Forecast errors (n mi) are followed by the number of forecasts in parentheses. Errors smaller than the NHC official forecast are shown in bold-face type. Verification includes the depression stage.

Forecast Technique	Forecast Period (h)						
	12	24	36	48	72	96	120
CLP5	41 (26)	81 (26)	121 (26)	169 (26)	261 (26)	329 (26)	376 (26)
GFNI	55 (23)	90 (23)	118 (23)	145 (23)	168 (23)	176 (23)	196 (23)
GFDI	37 (25)	56 (25)	<b>63</b> (25)	<b>77</b> (25)	<b>101</b> (25)	125 (25)	<b>140</b> (25)
GFDL*	35 (26)	54 (26)	67 (26)	<b>74</b> (26)	<b>93</b> (26)	<b>118</b> (26)	<b>135</b> (26)
GFDN*	53 (23)	88 (23)	116 (23)	138 (23)	167 (23)	172 (23)	187 (23)
GFSI	37 (23)	57 (20)	88 (20)	117 (19)	173 (18)	239 (18)	292 (18)
GFSO*	44 (25)	57 (22)	82 (21)	105 (20)	161 (19)	229 (19)	284 (19)
AEMI	39 (25)	52 (23)	78 (23)	114 (22)	149 (19)	209 (19)	249 (19)
NGPI	49 (24)	75 (24)	98 (24)	130 (24)	174 (24)	214 (24)	261 (24)
NGPS*	57 (25)	88 (25)	112 (25)	137 (25)	177 (25)	204 (25)	234 (25)
UKMI	34 (25)	<b>45</b> (25)	<b>53</b> (25)	<b>76</b> (25)	111 (25)	169 (25)	235 (25)
UKM*	<b>33</b> (13)	<b>49</b> (13)	<b>58</b> (13)	<b>69</b> (13)	<b>98</b> (13)	152 (13)	209 (13)
BAMD	42 (26)	67 (26)	93 (26)	125 (26)	198 (26)	267 (26)	323 (26)
BAMM	39 (26)	60 (26)	76 (26)	98 (26)	158 (26)	216 (26)	272 (26)
BAMS	37 (26)	61 (26)	89 (26)	123 (26)	208 (26)	311 (26)	397 (26)
CONU	36 (25)	51 (25)	<b>63</b> (25)	84 (25)	109 (25)	<b>124</b> (25)	<b>140</b> (25)
GUNA	<b>31</b> (22)	<b>41</b> (19)	<b>52</b> (19)	<b>70</b> (18)	<b>98</b> (18)	<b>117</b> (18)	<b>132</b> (18)
FSSE	<b>26</b> (12)	<b>34</b> (12)	<b>44</b> (10)	<b>71</b> (10)	<b>91</b> (4)	125 (2)	<b>127</b> (2)
OFCL	34 (26)	51 (26)	64 (26)	84 (26)	104 (26)	125 (26)	145 (26)
NHC Official (1995-2004 mean)	37 (2654)	68 (2378)	97 (2096)	123 (1829)	175 (1386)	208 (355)	259 (224)

\*Output from these models was unavailable at forecast time.

Errors given for the 96 and 120 h periods are averages over the four-year period 2001-4.

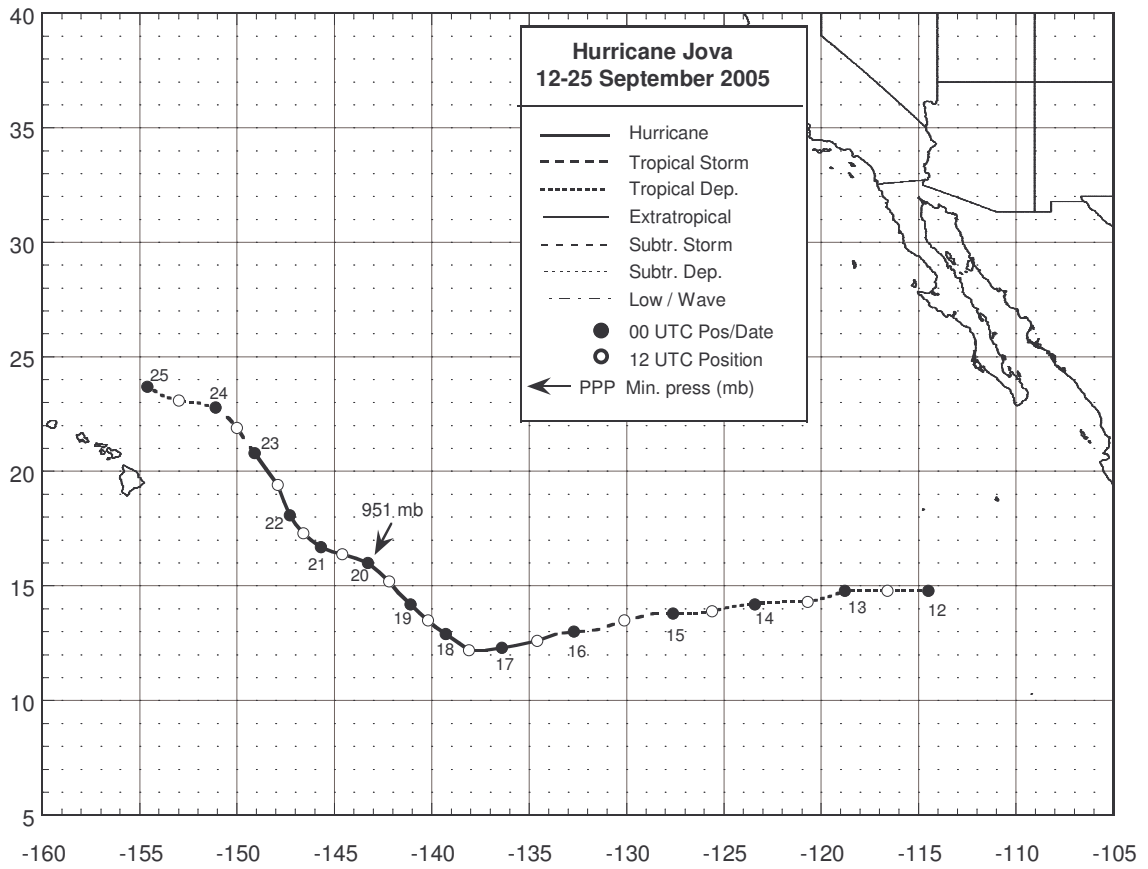


Figure 1. Best track positions for Hurricane Jova, 12-25 September 2005.

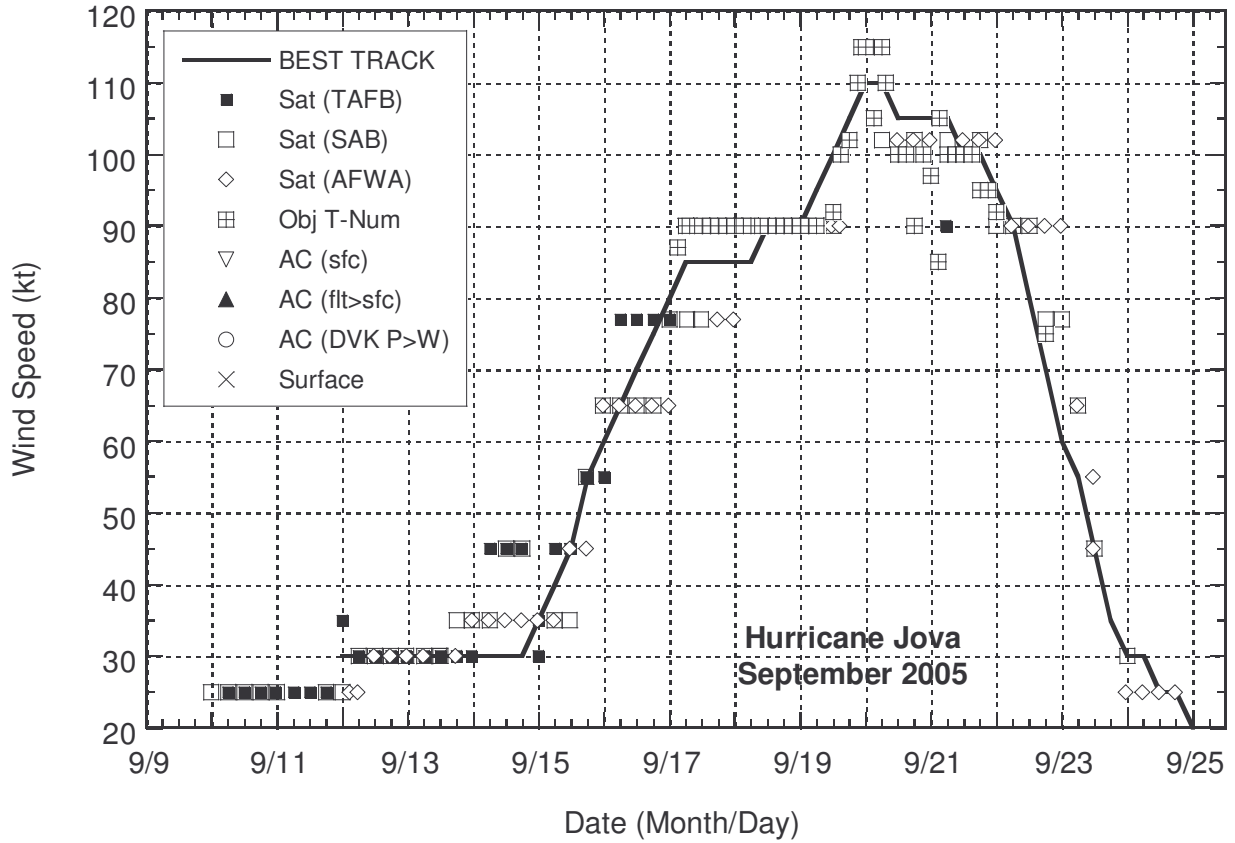


Figure 2. Selected wind observations and best track maximum sustained surface wind speed curve for Hurricane Jova, 12-25 September 2005. Objective Dvorak estimates represent linear averages over a three-hour period ending on the nominal observation time.



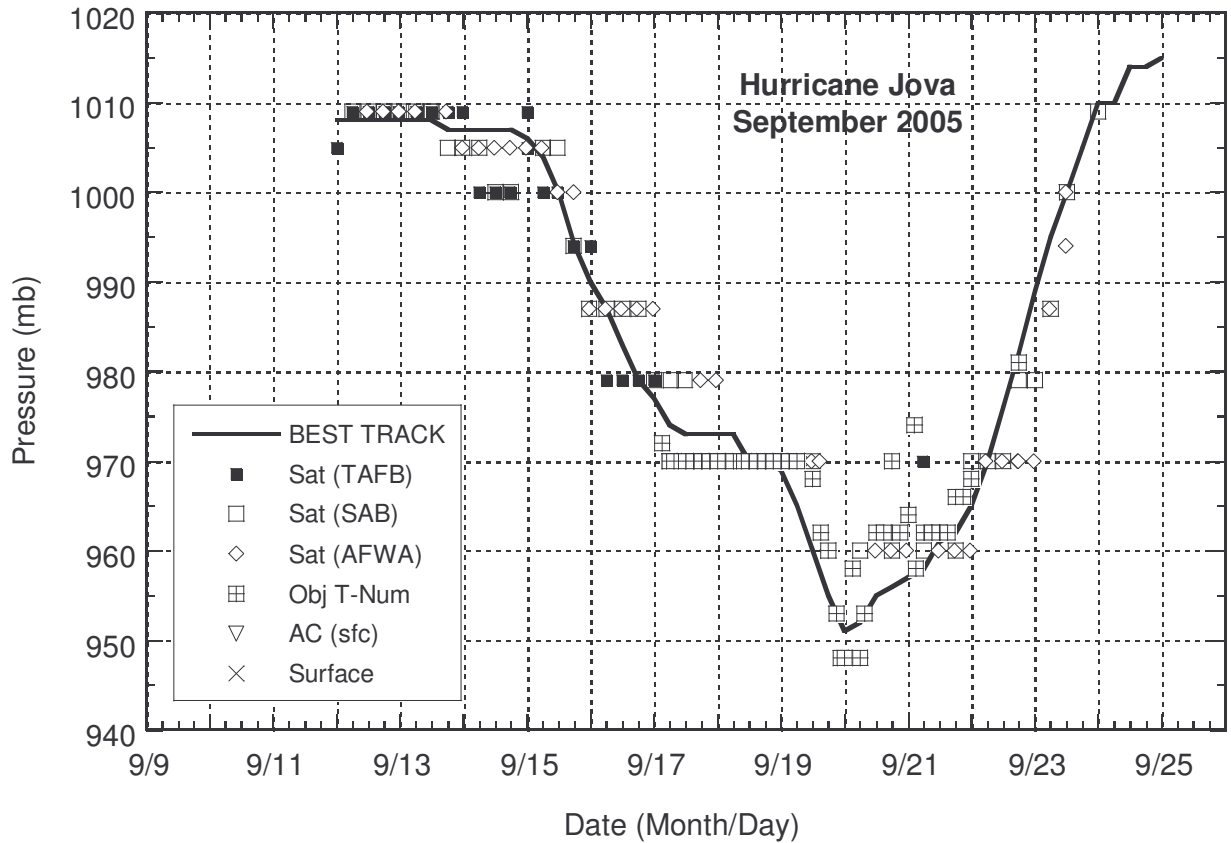


Figure 3. Selected pressure observations and best track minimum central pressure curve for Hurricane Jova, 12-25 September 2005. Objective Dvorak estimates represent linear averages over a three-hour period ending on the nominal observation time.

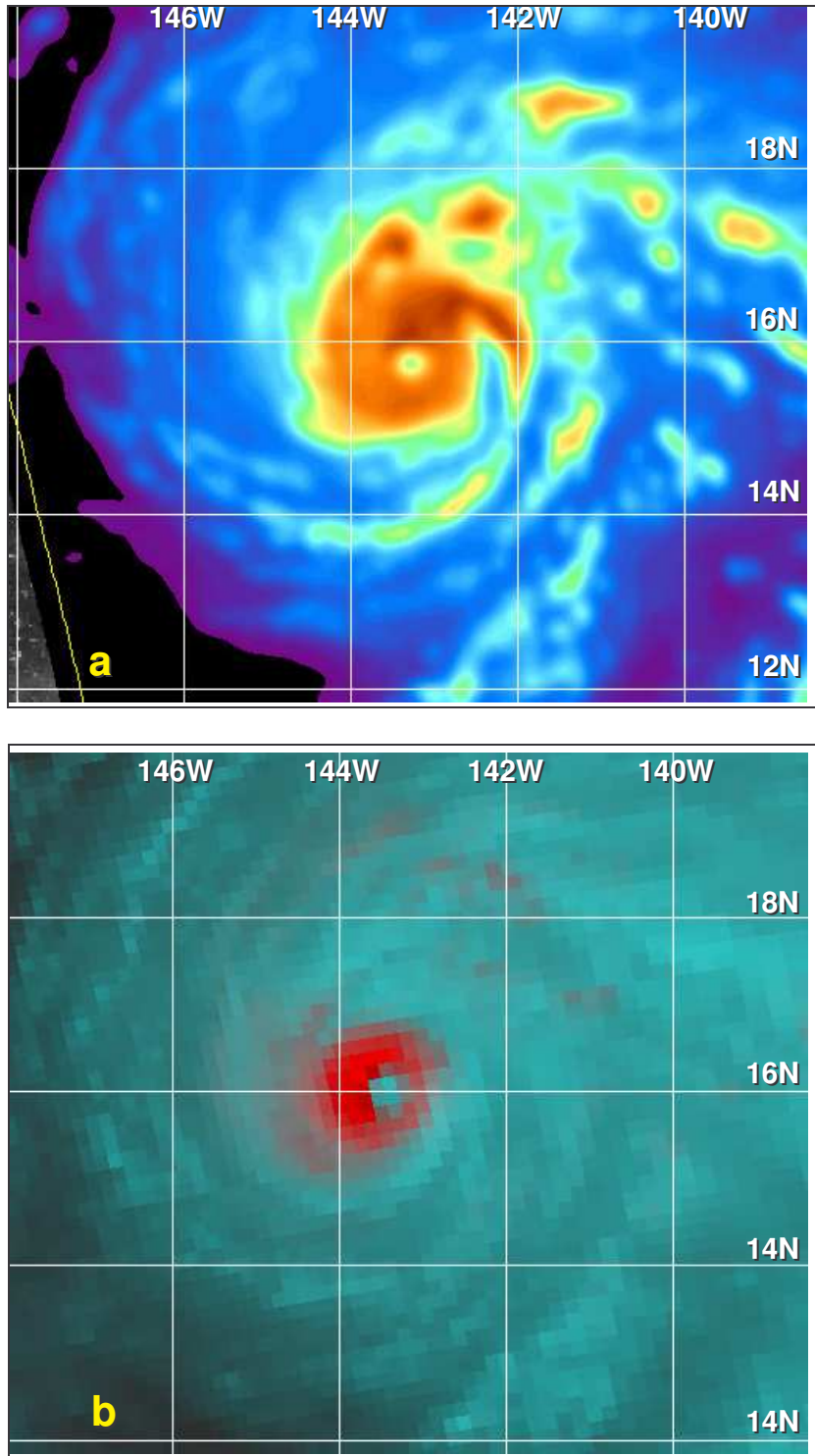


Figure 4. Microwave satellite imagery depicting the small eye near the time of Hurricane Jova's peak intensity of 110 kt – (a) 2246 UTC 19 Sep 2005 from AMSR-E 89 GHz; (b) 0023 UTC 20 Sep 2005 from AMSU-B. Raw ODT values were T6.2/120 kt and T5.9/112 kt, respectively (Images courtesy of the Fleet Numerical Meteorology and Oceanography Command, Monterey, CA).