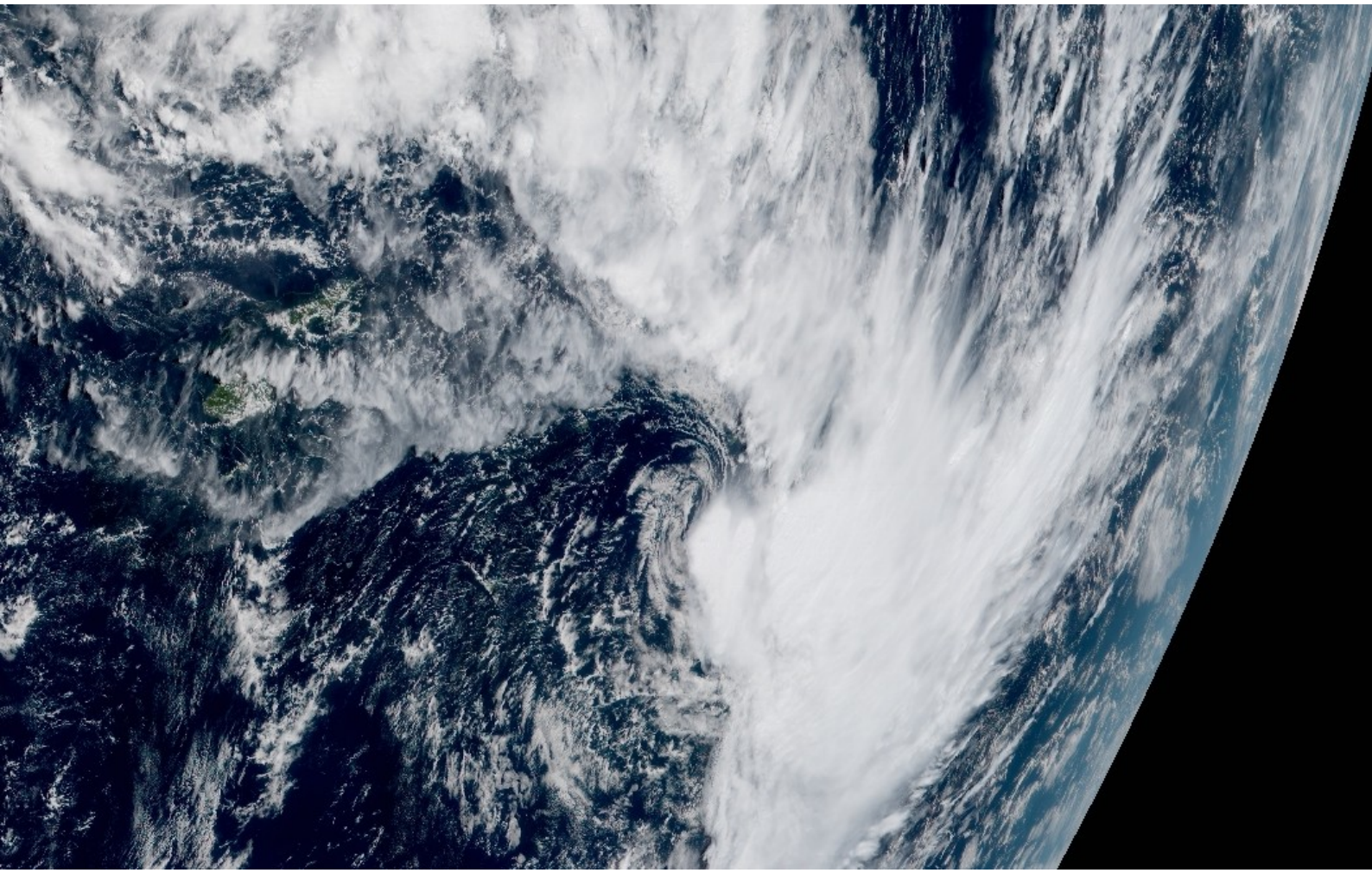
2017

Force Thirteen Cyclone Reports

Cyclone 14P (201712)



Cyclone 14P was an unnamed cyclone which only attained tropical storm status briefly, though persisted in the South Pacific for over a week.

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Cover photo: Himawari image of Cyclone 14P, captured late on April 5, 2017.

FORCE THIRTEEN

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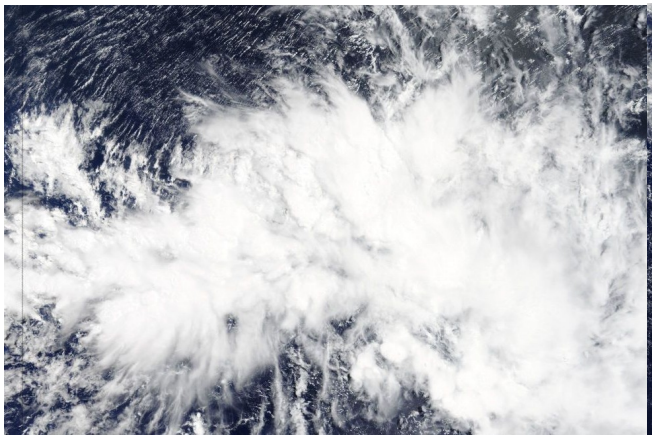
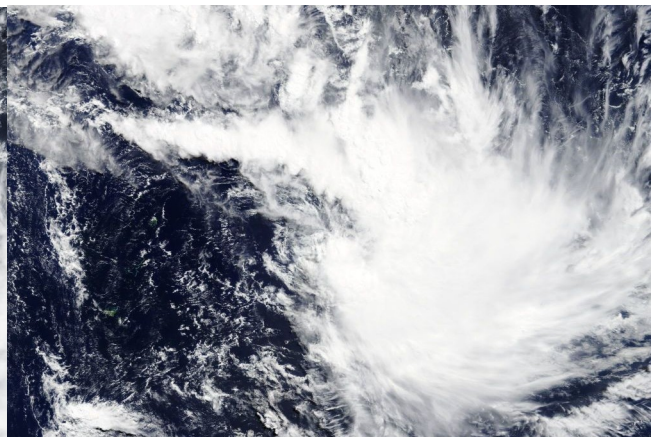
1.1. Synoptic History

Early in April, an energetic but disorganised area of convection was located over the Fiji and Samoa region of the South Pacific. A circulation developed near Samoa and was initially very elongated and took some time to become more presentable. By April 4th when the system was moving south near Niue, the circulation looked better, with deep convection established on the eastern side of the system. However, this was blown away to the southeast by high wind shear early on April 5th. Throughout much of the day, the center of the storm was devoid of new convection until new thunderstorms sprung up over the system on the afternoon of April 5th. By evening, the convection remained and was determined to have attained tropical storm status for a short period of time until the convection dissipated early on April 6th.

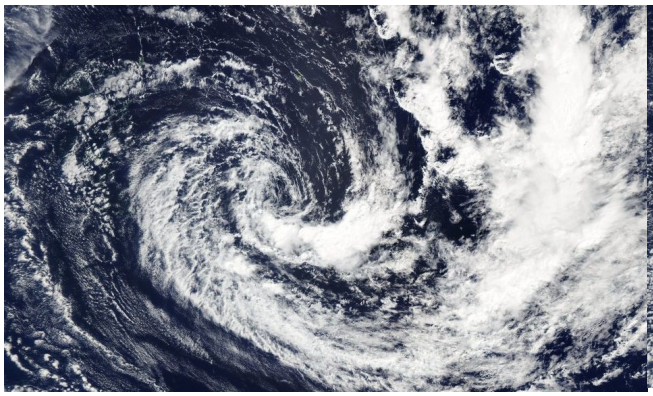
Some residual convection continued during the 6th, and by April 7th the system was mostly exposed, and was picked up by a front early on the 9th. The extratropical remnants of the storm did reattain gale force winds on April 12th as it curved back towards the east and eventually east-northeast into the 13th.



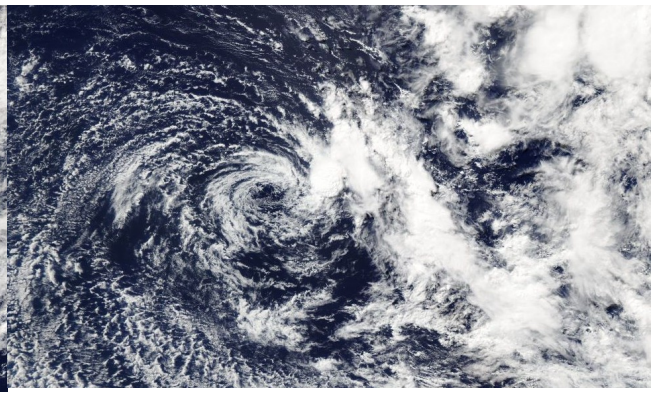
April 3rd



April 5th



April 8th



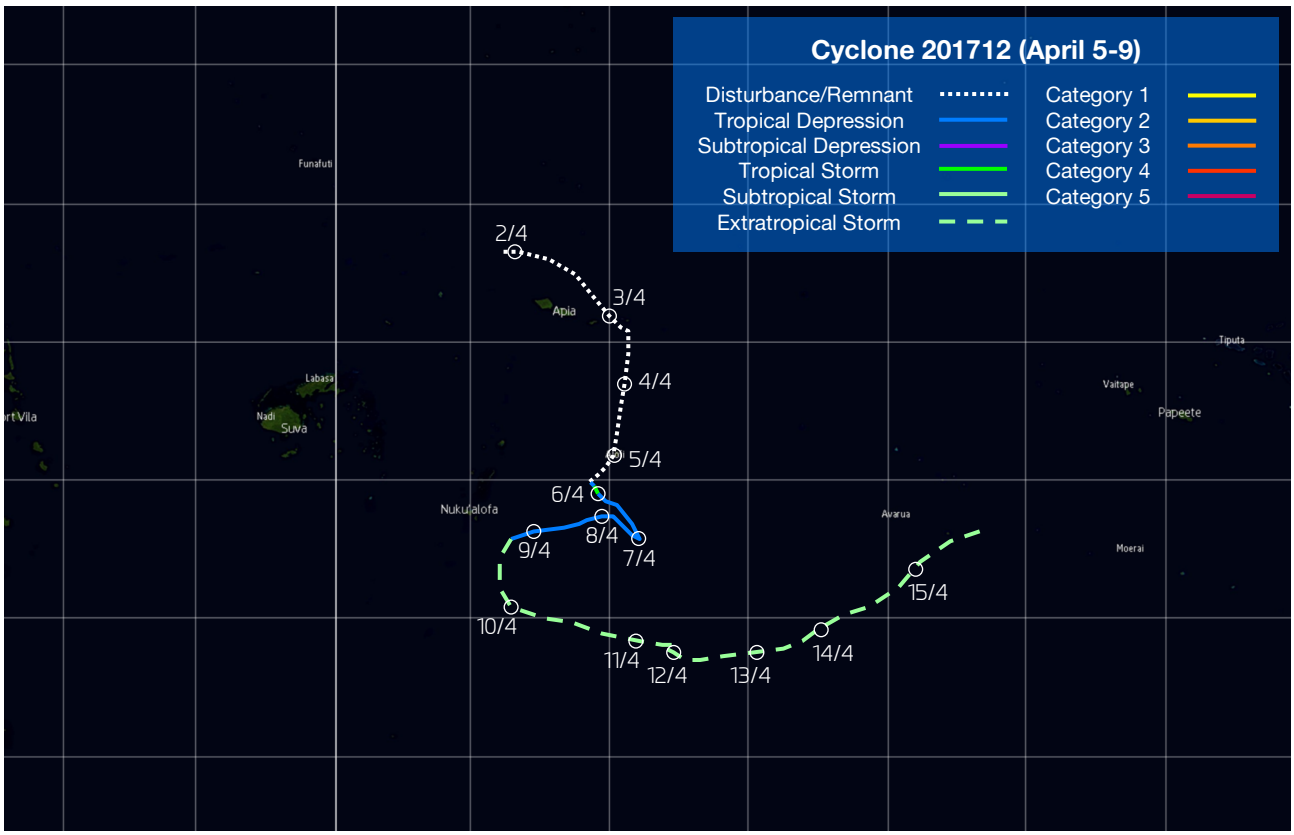
April 14th

1.2. Best Track

Below is the best track analysis from Force Thirteen, using Force Thirteen's SATOPS—a tool which uses infrared satellite imagery and cloud temperatures to estimate a storm's wind speed and air pressure. SATOPS does not take precedence over surface observations.

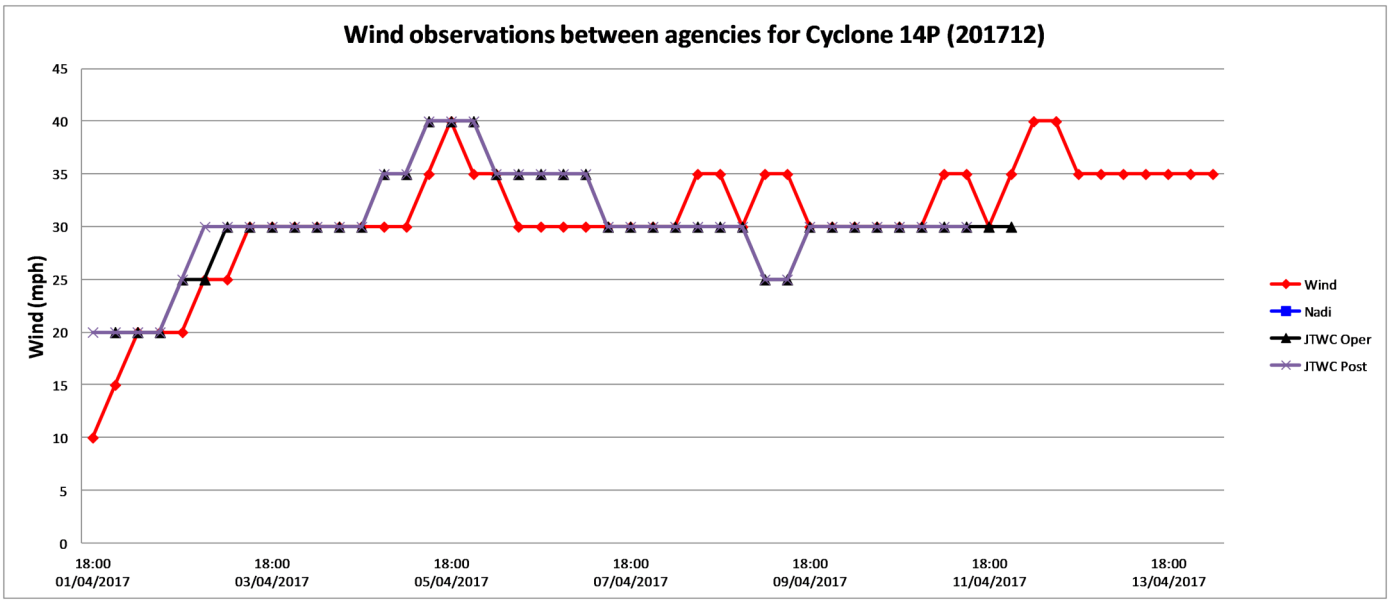
Date (dd/mm/yyyy)	Time	Latitude	Longitude	Wind	Press	Stage
01/04/2017	18:00	-12.1	-173.8	10	1012	Tropical Disturbance
02/04/2017	00:00	-12.1	-173.1	15	1011	Tropical Disturbance
02/04/2017	06:00	-12.3	-172.2	20	1012	Tropical Disturbance
02/04/2017	12:00	-12.8	-171.4	20	1012	Tropical Disturbance
02/04/2017	18:00	-13.4	-170.6	20	1011	Tropical Disturbance
03/04/2017	00:00	-13.9	-170	25	1010	Tropical Disturbance
03/04/2017	06:00	-14.4	-169.6	25	1009	Tropical Disturbance
03/04/2017	12:00	-14.7	-169.4	30	1006	Tropical Disturbance
03/04/2017	18:00	-15.6	-169.4	30	1006	Tropical Disturbance
04/04/2017	00:00	-16.4	-169.5	30	1005	Tropical Disturbance
04/04/2017	06:00	-17.3	-169.6	30	1005	Tropical Disturbance
04/04/2017	12:00	-18.6	-169.7	30	1004	Tropical Disturbance
04/04/2017	18:00	-19.1	-169.8	30	1002	Tropical Disturbance
05/04/2017	00:00	-19.5	-170.1	30	1002	Tropical Disturbance
05/04/2017	06:00	-19.8	-170.5	30	1002	Tropical Disturbance
05/04/2017	12:00	-20.1	-170.8	35	1000	Tropical Depression
05/04/2017	18:00	-20.3	-170.6	40	999	Tropical Storm
06/04/2017	00:00	-20.4	-170.4	35	1001	Tropical Depression
06/04/2017	06:00	-20.6	-170.1	35	1001	Tropical Depression
06/04/2017	12:00	-20.8	-169.8	30	1002	Tropical Depression
06/04/2017	18:00	-21.8	-168.8	30	1002	Tropical Depression
07/04/2017	00:00	-22.4	-168.6	30	1004	Tropical Depression
07/04/2017	06:00	-22.2	-168.9	30	1003	Tropical Depression
07/04/2017	12:00	-21.9	-169.4	30	1003	Tropical Depression
07/04/2017	18:00	-21.5	-169.8	30	1002	Tropical Depression
08/04/2017	00:00	-21.5	-170.3	30	1001	Tropical Depression
08/04/2017	06:00	-21.6	-170.9	30	1001	Tropical Depression
08/04/2017	12:00	-21.7	-171.4	35	1001	Tropical Depression
08/04/2017	18:00	-21.8	-172.1	35	1001	Tropical Depression
09/04/2017	00:00	-22	-172.8	30	1002	Tropical Depression
09/04/2017	06:00	-22.5	-173.5	35	1001	Extratropical
09/04/2017	12:00	-23	-173.7	35	1002	Extratropical
09/04/2017	18:00	-24	-173.7	30	1004	Extratropical
10/04/2017	00:00	-24.7	-173.2	30	1005	Extratropical
10/04/2017	06:00	-25	-172.4	30	1004	Extratropical
10/04/2017	12:00	-25.2	-171.7	30	1004	Extratropical
10/04/2017	18:00	-25.7	-170.2	30	1005	Extratropical
11/04/2017	00:00	-26	-168.9	30	1005	Extratropical
11/04/2017	06:00	-26.1	-168.1	35	1004	Extratropical
11/04/2017	12:00	-26.2	-167.7	35	1004	Extratropical
11/04/2017	18:00	-26.5	-167.9	30	1005	Extratropical
12/04/2017	00:00	-26.8	-167.5	35	1005	Extratropical
12/04/2017	06:00	-27	-167.2	40	1003	Extratropical
12/04/2017	12:00	-27	-166.9	40	1001	Extratropical
12/04/2017	18:00	-26.9	-166	35	1001	Extratropical
13/04/2017	00:00	-26.7	-164.8	35	1002	Extratropical
13/04/2017	06:00	-26.4	-163.6	35	1002	Extratropical
13/04/2017	12:00	-25.8	-163.2	35	1002	Extratropical
13/04/2017	18:00	-25.4	-162.6	35	1002	Extratropical
[illegible]/2017	00:00	-24.9	-161.8	35	1001	Extratropical
[illegible]/2017	06:00	-24.6	-160.9	35	1001	Extratropical

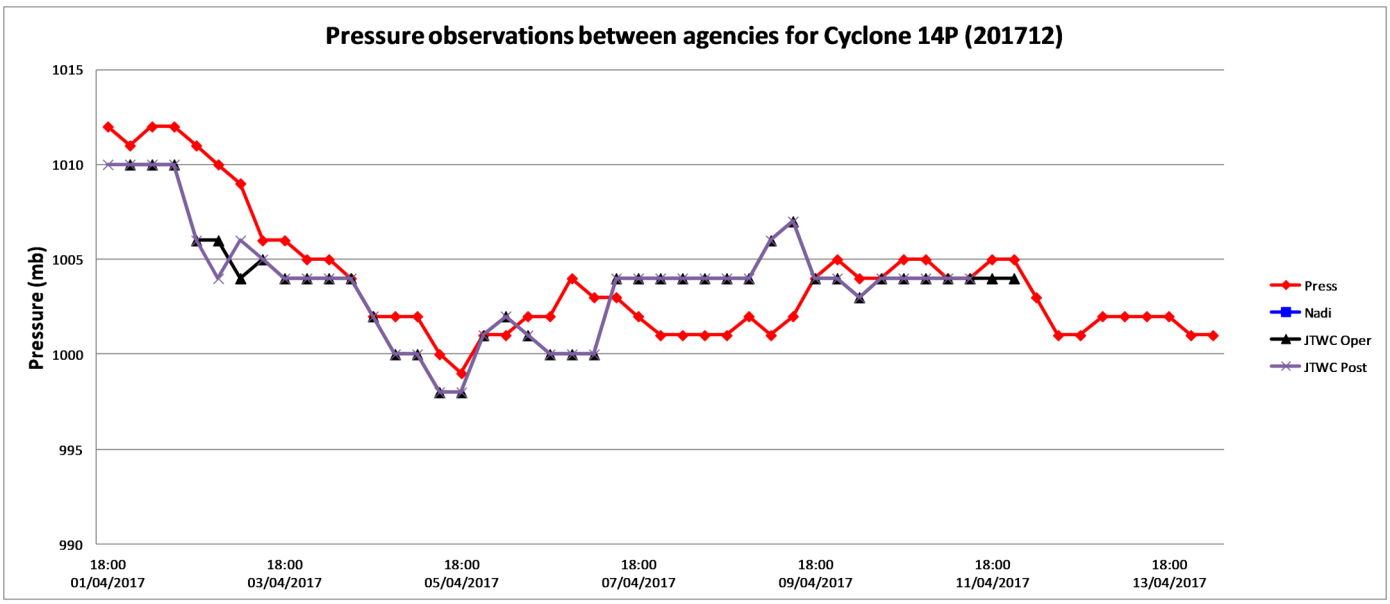
1.3. Track Chart



1.4. Comparison with other agencies

14P was monitored by the Regional Specialized Meteorological Centre, in this instance the Fiji Meteorological Service, and by the U.S. Joint Typhoon Warning Center (JTWC). Data from Fiji is not yet available, and so the charts below show comparisons between Force Thirteen's best track and the JTWC's observations.





2. Effects on Land

Since Cyclone 14P was weak, no effects were reported on land. However, the storm delivered some rain to some locations in the South Pacific. Below is a list of satellite derived rainfall totals. Despite the center of the cyclone passing almost directly over Niue, no significant rainfall was detected on the island.

Wallis and Futuna

Matā'utu	40mm

Tokelau

Atafu	120mm
Nukunonu	120mm
Fakaofo	80mm

Samoa

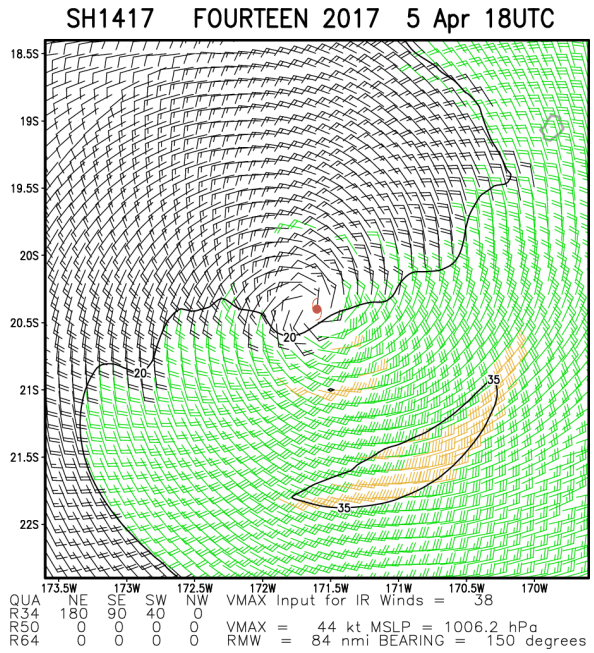
Safotu	40mm
Vailoa	40mm
Salelologa	30mm
Faleasiu	10mm
Apia	10mm
Solosolo	20mm

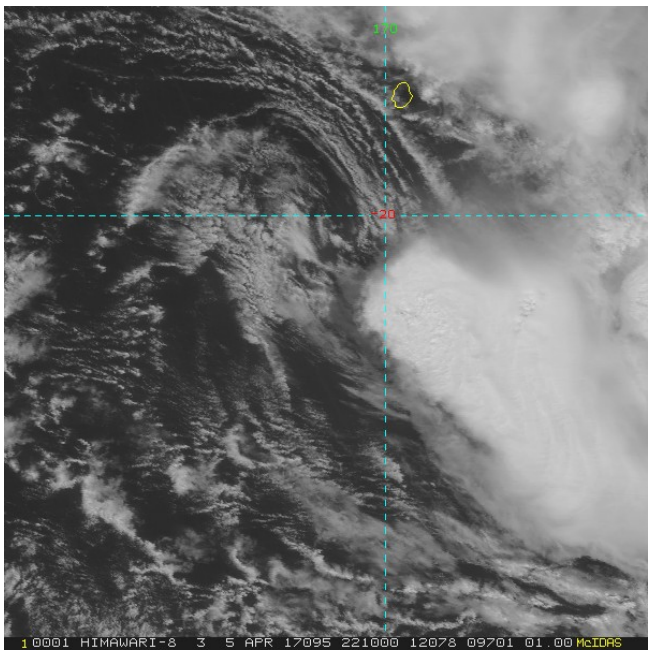
American Samoa

Futiga	70mm
Pago Pago	60mm
Olosega	40mm
Faleasao	70mm
Taulaga	130mm
Rose Atoll	70mm

Cook Islands

Pukapuka	140mm
Kikau	60mm
Manihiki	50mm
Palmerston	110mm
Beveridge Reef	300mm

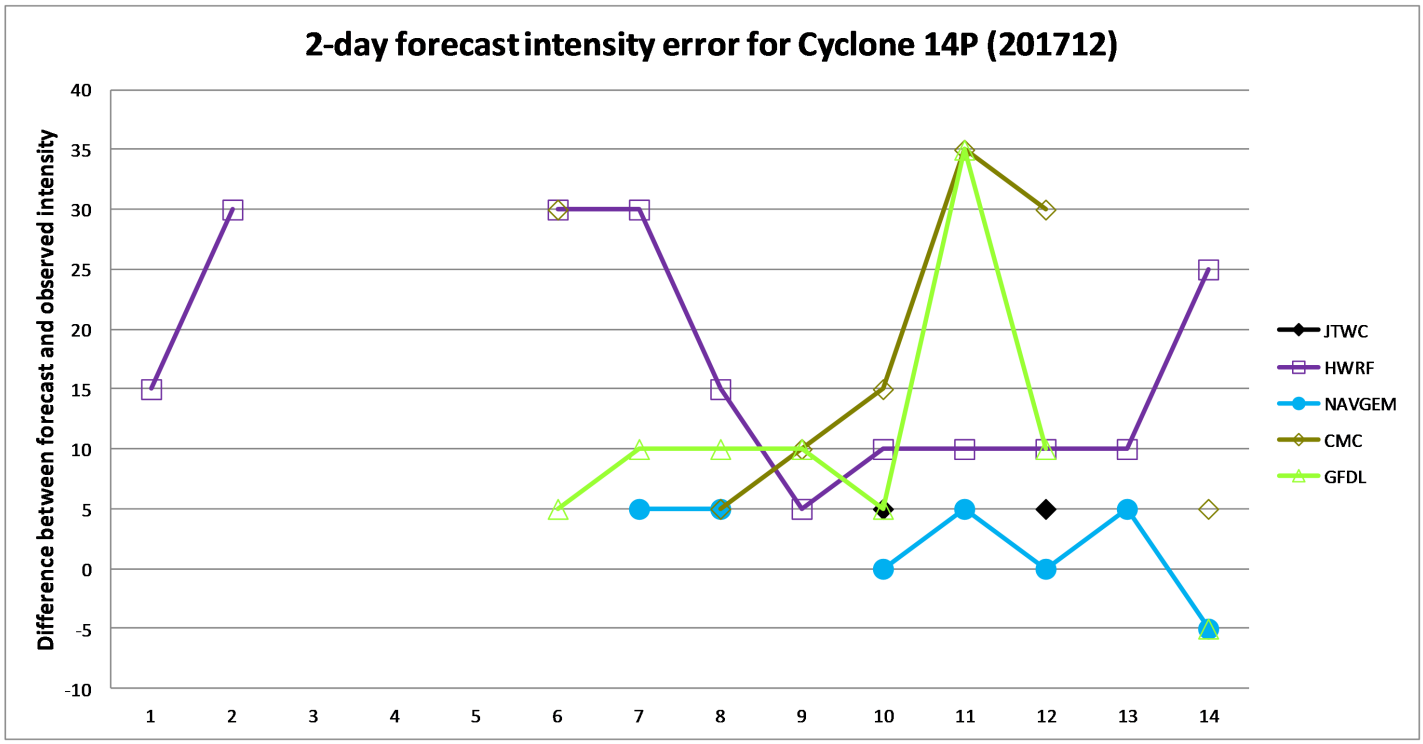


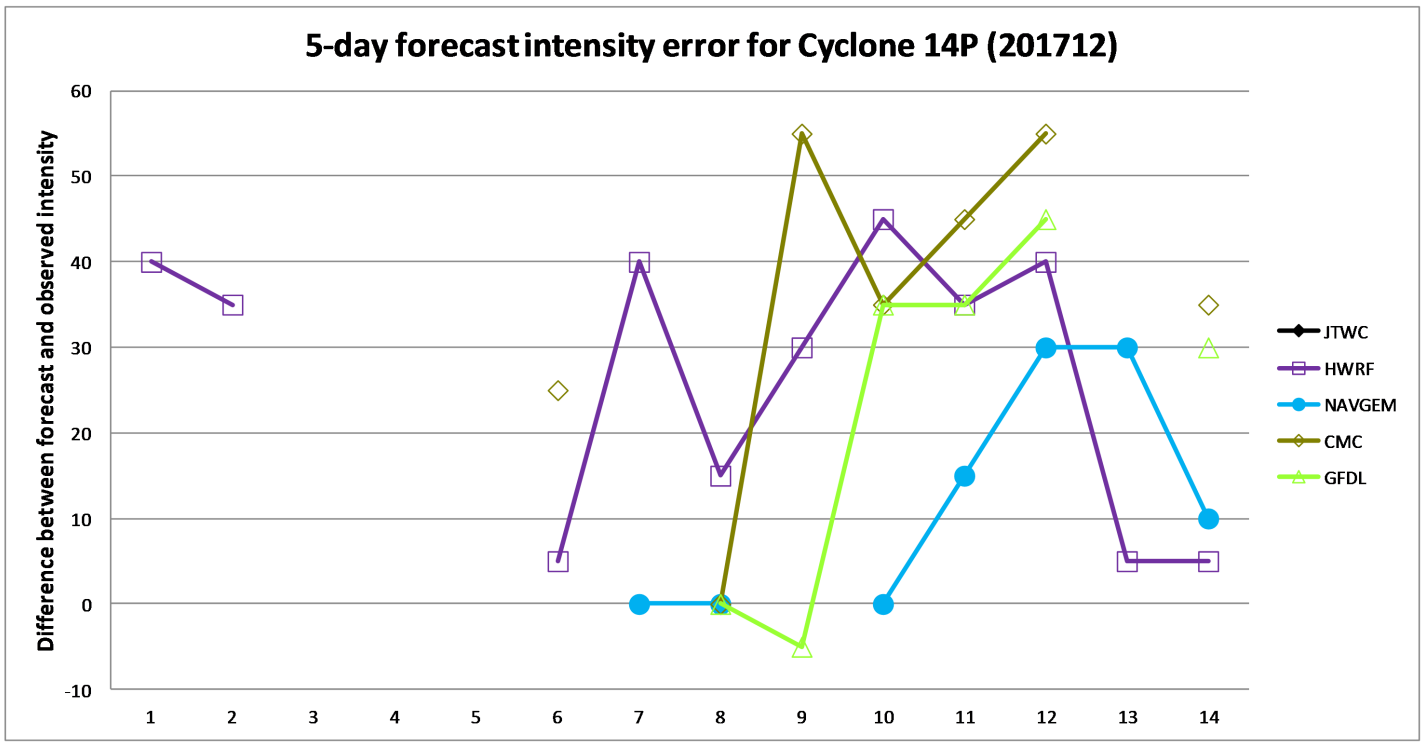


Satellite estimated winds and visible satellite image of Cyclone 14P near peak intensity.

3. Forecasting Critique

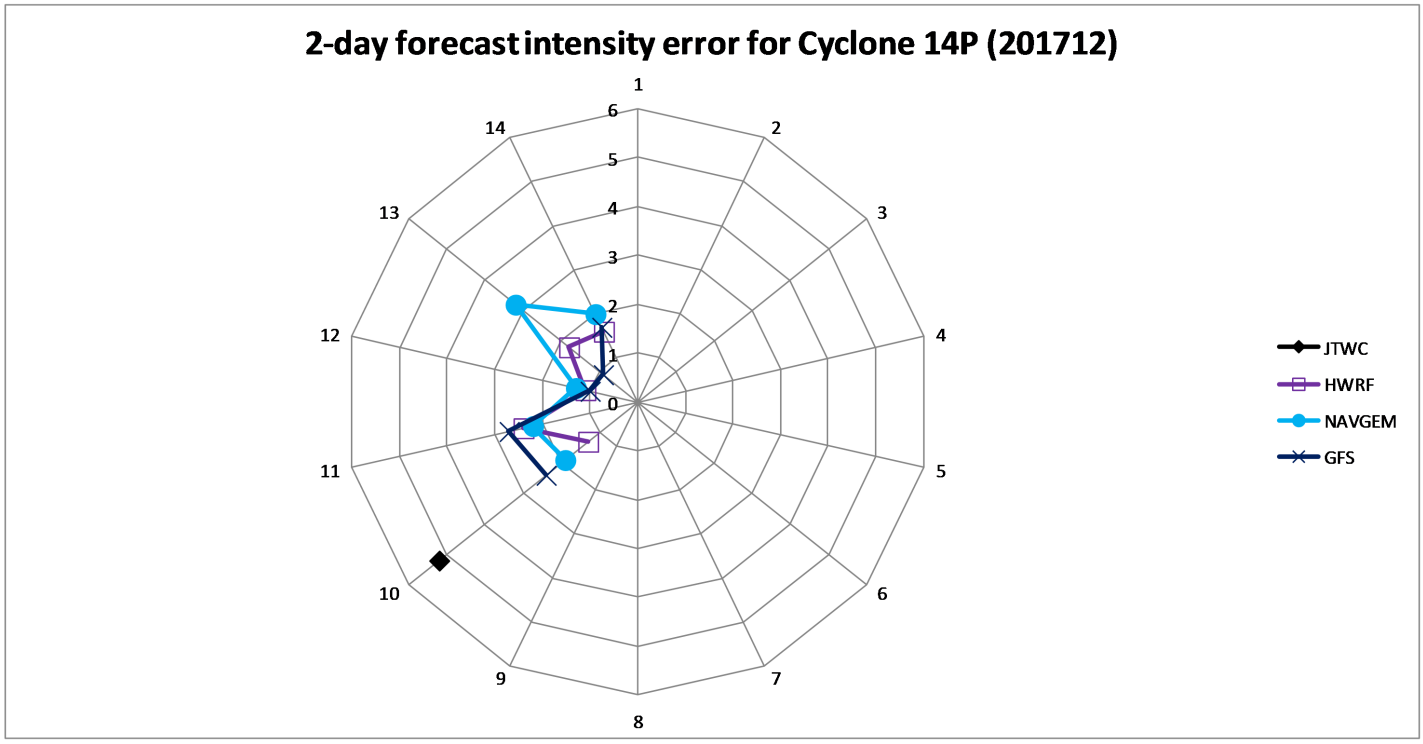
The next two pages show the track and intensity forecast error from the computer models and the JTWC during Cyclone 14P.
The intensity error charts show how many miles per hour the model predictions were from the observed intensity two and five days later. A value of 0 denotes a perfectly accurate prediction. Negative values correspond to predictions lower than the observation, and positive values show predictions higher than the observation.

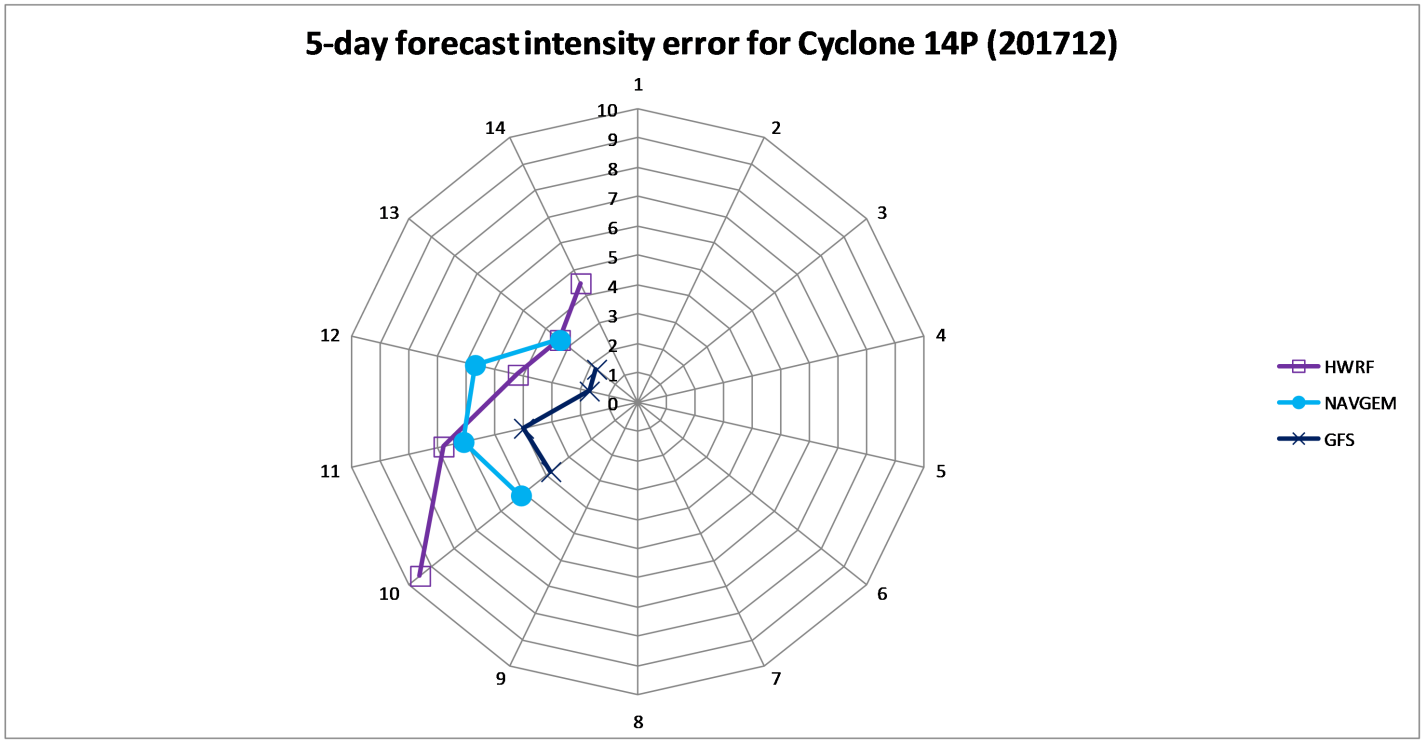




3. Forecasting Critique

The track error graphics show how far away from a perfectly accurate positional prediction the computer models and the JTWC predicted two and five days before the fact. Values are expressed in angular degrees, and a value closer to 0 (the center of the graphic) indicates a more accurate prediction.





3. Forecasting Critique

Data from the charts are published below.

2-day forecast intensity error								
Run	JTWC	FIJI	HWRF	GFS	NAVGEM	GFDN	CMC	GFDL
2017040306			15					
2017040312			30					
2017040318								
2017040400								
2017040406								
2017040412			30				30	5
2017040418			30		5			10
2017040500			15		5		5	10
2017040506			5				10	10
2017040512	5		10		0		15	5
2017040518			10		5		35	35
2017040600	5		10		0		30	10
2017040606			10		5			
2017040612			25		-5		5	-5

5-day forecast intensity error								
Run	JTWC	FIJI	HWRF	GFS	NAVGEM	GFDN	CMC	GFDL
2017040306			40					
2017040312			35					
2017040318								
2017040400								
2017040406								
2017040412			5				25	
2017040418			40		0			
2017040500			15		0		0	0
2017040506			30				55	-5
2017040512			45		0		35	35
2017040518			35		15		45	35
2017040600			40		30		55	45
2017040606			5		30			
2017040612			5		10		35	30

Model	**Average**	**Predictions**
JTWC	5	2
FIJI	40	2
HWRF	22	22
GFS	0	0
NAVGEM	7.1	14
GFDN	0	0
CMC	27.1	14
GFDL	15.7	14

Therefore, the best model for intensity was the NAVGEM

3. Forecasting Critique

Data from the charts are published below.

2-day forecast track error								
Run	JTWC	FIJI	HWRF	GFS	NAVGEM	GFDN	CMC	GFDL
2017040306								
2017040312								
2017040318								
2017040400								
2017040406								
2017040412								
2017040418								
2017040500								
2017040506								
2017040512	5.2		1.3	2.4	1.9			
2017040518			2.4	2.7	2.2			
2017040600			1.1	1	1.3			
2017040606			1.8	0.9	3.2			
2017040612			1.6	1.7	2			

5-day forecast track error								
Run	JTWC	FIJI	HWRF	GFS	NAVGEM	GFDN	CMC	GFDL
2017040306								
2017040312								
2017040318								
2017040400								
2017040406								
2017040412								
2017040418								
2017040500								
2017040506								
2017040512			9.5	3.8	5.1			
2017040518			6.8	4	6.1			
2017040600			4.2	1.7	5.7			
2017040606			3.4	1.8	3.4			
2017040612			4.5					

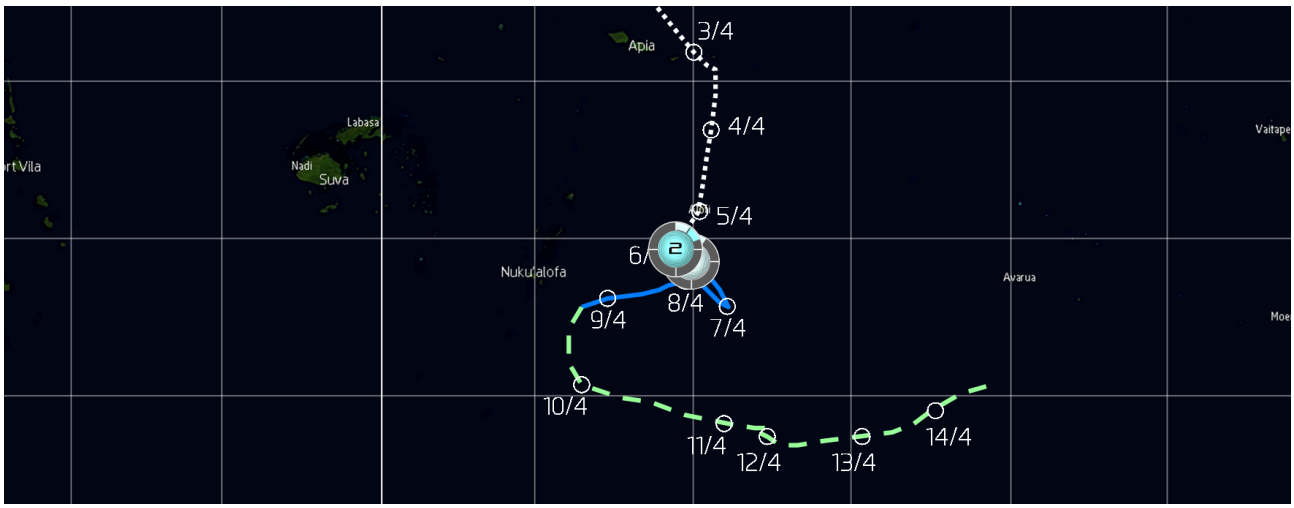
Model	**Average**	**Predictions**
JTWC	5.2	1
FIJI	0	0
HWRF	3.7	10
GFS	2.2	10
NAVGEM	3.4	9
GFDN	0	0
CMC	0	0
GFDL	0	0

Therefore, the best model for track predictions was the GFS.

4. Cyclone Destruction Potential Scale

The Cyclone Destruction Potential Scale (CDPS) is a new way of measuring cyclone impacts in a more meaningful way. For the past 45 years, storms worldwide have been measured using the Saffir-Simpson Hurricane Wind Scale, split into five categories. However, this scale measures wind alone, and does not correlate well with actual impacts on land, measured by monetary damage.
The CDPS measures other factors, such as storm size and forward speed as well as intensity to create a ten tiered scale that encompasses tropical storms as well as hurricanes.

Stage 1—Small or weak storms that are unlikely to cause a significant impact.
Stage 2—Generally disorganised storms that can cause significant damage.
Stage 3—Further organised systems that are likely to cause significant damage.
Stage 4—Somewhat powerful storms that are likely to cause extensive damage.
Stage 5—Powerful storms that are likely to cause devastating damages.
Stage 6—Very powerful storms that are likely to cause catastrophic damage.
Stage 7—Extremely powerful storms that are likely to cause catastrophic damage.
Stage 8—Super storms that are likely to cause incredible damage.
Stage 9—Super storms that may cause total damage.
Stage 10—Super storms that are likely to cause total damage.



Cyclone 14P was the tenth storm to be observed by Force Thirteen using the CDPS—a method which was adopted in January 2017.

14P was a Stage 2 cyclone at peak.

The Cyclone Destruction Potential Scale was created by Devon Williams in 2016. More information can be found at: https://drive.google.com/file/d/0B7pEWk6yHKggSE1STHg2UFJmbHM/view

5. Force Thirteen's Coverage on 14P

Due to Cyclone 14P's lowly status, it barely made it as a footnote in Force Thirteen's coverage due to the presence of Cyclones Cook and Ernie. Updates were being delivered by the Force Thirteen AU team since the main channel was taking a scheduled break.

Comments, suggestions and inquiries should be directed to force-13@hotmail.co.uk, or any of Force Thirteen's online platforms.