

UNOSAT

Madagascar – Tropical Cyclone AVA-18

Population Exposure as of 04 January 2018

Population Exposure Analysis

4 January 2018

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Overview

A strong tropical cyclone AVA-18 in the Indian Ocean is heading southwest towards coasts of Madagascar. It is expected to make landfall and continue southward along the eastern coast of Madagascar on Friday 5 January 2018, likely affecting mostly the region of Analanjirofo. The tropical cyclone will reach a maximum wind speed of 130 km/h. Based on the observed and predicted cyclone track as of 4th January 2018 (00:00 UTC), sustained wind speeds zones and population data from WorldPop, UNITAR-UNOSAT conducted a population exposure analysis for Madagascar. ~18,600,000 people are exposed to wind speed of at least 60 km/h :

- 1,921,571 people are exposed to 120 km/h winds
- 8,508,507 people are exposed to the 90 km/h winds,
- 8,191,489 people are exposed to the 60 km/h winds.

Taking into account the zones with a flood hazard of 25 years return period within the predicted wind speed zones, about 156,300 people are living in these areas and are potentially exposed to 120 km/h winds. About 795,500 people are exposed to floods in the 90 km/h sustained wind speed zone and 571,500 people in the 60 km/h sustained wind speed zone.

Population Exposure to Tropical Cyclone AVA-18

Wind Speed Zones

Population exposure estimates are based on cyclone track from JRC and WorldPop data



23,852,000

Total population of Madagascar

1,921,571

Total population living in 120 km/h wind speed zones

8,508,507

Total population living in 90 km/h wind speed zones

8,191,489

Total population living in 60 km/h wind speed zones

Administrative level (Region/District)	Exposed Population by wind speed zone			
	120 km/h	90 km/h	60 km/h	Total
Alaotra Mangoro	155,316	366,875	596,100	1,118,291
Ambatondrazaka	8,011	125,093	221,469	354,573
Amparafaravola			295,423	295,423
Andilamena			79,208	79,208
Anosibe-An'ala	41,841	53,472		95,313
Moramanga	105,464	188,310		293,774
Amoron I Mania		684,704	97,305	782,009
Ambatofinandrahana		74,610	97,305	171,915
Ambositra		286,315		286,315
Fandriana		221,736		221,736
Manandriana		102,043		102,043
Analamanga		2,067,879	1,709,612	3,777,491
Ambohidratrimo			431,334	431,334
Andramasina		181,554		181,554
Anjozorobe		35,352	153,948	189,300
Ankazobe			162,354	162,354
Antananarivo Atsimondrano		451,647	204,974	656,621
Antananarivo Avaradrano		314,796	76,992	391,788
Antananarivo Renivohitra		885,223	661,345	1,546,569
Manjakandriana		199,307	18,664	217,971
Analanjirifo	198	109,657	999,879	1,109,734
Fenerive Est		36,827	292,201	329,028
Mananara-Avaratra			181,387	181,387
Maroantsetra			240,462	240,462
Sainte Marie			28,320	28,320
Soanierana Ivongo			145,265	145,265
Vavatenina	198	72,830	112,245	185,272
Androy		267,447	521,219	788,665

Ambovombe-Androy		248,565	124,943	373,508
Bekily			175,865	175,865
Beloha			121,557	121,557
Tsihombe		18,881	98,854	117,735
Anosy	92,692	521,210	120,285	734,187
Amboasary-Atsimo		229,539	979	230,518
Betroka		85,878	119,306	205,184
Taolagnaro	92,692	205,793		298,486
Atsimo Andrefana			96,167	96,167
Ampanihy Ouest			81,608	81,608
Benenitra			9,975	9,975
Beroroha			3,160	3,160
Betioky Atsimo			1,424	1,424
Atsimo Atsinanana		964,780		964,780
Befotaka		57,157		57,157
Farafangana		369,743		369,743
Midongy-Atsimo		49,067		49,067
Vangaindrano		351,822		351,822
Vondrozo		136,992		136,992
Atsinanana	1,220,819	171,721		1,392,539
Antanambao Manampontsy	52,030			52,030
Brickaville	194,030	6,721		200,751
Mahanoro	262,025			262,025
Marolambo	25,241	134,454		159,695
Toamasina I	321,390			321,390
Toamasina II	216,928	30,546		247,474
Vatomandry	149,173			149,173
Betsiboka			308,824	308,824
Kandreho			17,239	17,239
Maevatanana			161,155	161,155
Tsaratana			130,429	130,429
Boeny			70,907	70,907
Ambato Boeni			61,417	61,417
Marovoay			9,490	9,490
Bongolava			487,511	487,511
Fenoarivobe			143,273	143,273
Tsiroanomandidy			344,237	344,237
Haute Matsiatra		1,257,452	54,005	1,311,458
Ambalavao		221,829	7,607	229,437
Ambohimahasoa		229,228		229,228
Fianarantsoa I		225,341		225,341
Ikalamavony		52,672	46,398	99,071
Isandra		138,184		138,184
Lalangina		180,675		180,675
Vohibato		209,522		209,522
Ihorombe		162,596	120,821	283,417
Iakora		53,843		53,843
Ihosy		46,184	120,821	167,005

Ivohibe		62,569		62,569
Itasy		11,776	777,970	789,747
Arivonimamo		11,776	318,892	330,668
Miarinarivo			259,258	259,258
Soavinandriana			199,821	199,821
Melaky			6,514	6,514
Ambatomainty			6,514	6,514
Menabe			115,492	115,492
Mahabo			32,859	32,859
Miandrivazo			82,634	82,634
Sava			321,642	321,642
Andapa			77,049	77,049
Antalaha			244,586	244,586
Sambava			7	7
Sofia			698,233	698,233
Antsohihy			183	183
Bealanana			1,222	1,222
Befandriana Nord			193,194	193,194
Mampikony			142,221	142,221
Mandritsara			273,907	273,907
Port-Berge (Boriziny-Vaovao)			87,506	87,506
Vakinankaratra		851,823	1,089,002	1,940,825
Ambatolampy		259,178	19,853	279,030
Antanifotsy		311,093	17,628	328,721
Antsirabe I		14,014	249,581	263,595
Antsirabe II		267,538	166,886	434,424
Betafo			272,159	272,159
Faratsiho			206,476	206,476
Mandoto			156,419	156,419
Vatovavy Fitovinany	452,546	1,070,587		1,523,133
Ifanadiana		168,697		168,697
Ikongo		199,147		199,147
Manakara Atsimo	93,630	303,456		397,086
Mananjary	174,217	163,897		338,114
Nosy-Varika	184,699	73,088		257,787
Vohipeno		162,303		162,303
Total	1,921,571	8,508,507	8,191,489	18,621,567

The population exposure, summarized by Region and District, has been calculated using a 100 m resolution WorldPop dataset. This is a preliminary analysis & has not yet been validated in the field.

Download complete excel table from [here](#)

Population Living within Flood Hazard Zones with 25 Years of return period and Exposed to Tropical Cyclone AVA-18

Population exposure estimates are based on flood hazard zones of 25 years return period (GAR Risk Data Platform), cyclone track (JRC) and WorldPop data.



23,852,000

Total population of Madagascar

156,342

Total population living in flood hazard zones of 25 years return period and exposed to **120 km/h** cyclone winds

795,444

Total population living in flood hazard zones of 25 years return period and exposed to **90 km/h** cyclone winds

571,425

Total population living in flood hazard zones of 25 years return period and exposed to **60 km/h** cyclone winds

Administrative level (Region/District)	Flood Hazard of 25 years return period			
	120 km/h	90 km/h	60 km/h	Total
Alaotra Mangoro	13,882	22,277	81,264	117,423
Ambatondrazaka	2,485	6,547	39,194	48,226
Amparafaravola			35,173	35,173
Andilamena			6,896	6,896
Anosibe-An'ala	2,125	3,201		5,326
Moramanga	9,272	12,529		21,801
Amoron I Mania		58,388	9,218	67,606
Ambatofinandrahana		5,479	9,218	14,697
Ambositra		34,039		34,039
Fandriana		13,536		13,536
Manandriana		5,333		5,333
Analamanga		77,969	92,264	170,233
Aambohidratrimo			36,107	36,107
Andramasina		6,800		6,800
Anjozorobe		5,107	17,382	22,489
Ankazobe			13,930	13,930
Antananarivo Atsimondrano		10,551	13,948	24,499
Antananarivo Avaradrano		22,395	4,937	27,332
Antananarivo Renivohitra		2,807	2,494	5,301
Manjakandriana		30,309	3,466	33,775
Analanjirofo	828	4,236	129,553	134,617
Fenerive Est		3,007	7,767	10,774
Mananara-Avaratra			36,827	36,827
Maroantsetra			41,019	41,019

Sainte Marie			55	55
Soanierana Ivongo			3,538	3,538
Vavatenina	828	1,229	40,346	42,404
Atsimo Atsinanana		149,619		149,619
Befotaka		3,432		3,432
Farafangana		54,830		54,830
Midongy-Atsimo		5,537		5,537
Vangaindrano		75,384		75,384
Vondrozo		10,435		10,435
Atsinanana	101,743	34,578		136,322
Antanambao Manampontsy	21,549			21,549
Brickaville	5,256	1,268		6,524
Mahanoro	7,877			7,877
Marolambo	3,232	16,993		20,225
Toamasina I	23,290			23,290
Toamasina II	26,048	16,317		42,365
Vatomandry	14,492			14,492
Betsiboka			7,396	7,396
Kandreho			1,612	1,612
Maevatanana			2,610	2,610
Tsaratana			3,173	3,173
Boeny			4,964	4,964
Ambato Boeni			4,878	4,878
Marovoay			86	86
Bongolava			40,635	40,635
Fenoarivobe			4,687	4,687
Tsiroanomandidy			35,948	35,948
Haute Matsiatra		130,397	11,563	141,960
Ambalavao		37,850	8,153	46,004
Ambohimahasoa		33,422		33,422
Fianarantsoa I		21,673		21,673
Ikalamavony		5,315	3,409	8,725
Isandra		9,804		9,804
Lalangina		10,418		10,418
Vohibato		11,913		11,913
Ihorombe		21,841	15,989	37,830
Iakora		2,396		2,396
Ihosy		8,277	15,989	24,267
Ivohibe		11,168		11,168
Itasy		4,288	94,123	98,411
Arivonimamo		4,288	27,088	31,376
Miarinarivo			19,507	19,507
Soavinandriana			47,528	47,528
Sofia			26,324	26,324
Antsohihy			3,520	3,520
Bealanana			1,098	1,098
Befandriana Nord			2,517	2,517
Mandritsara			15,166	15,166

Port-Berge (Boriziny-Vaovao)			4,023	4,023
Vakinankaratra		40,021	58,133	98,153
Ambatolampy		21,764	2,017	23,782
Antanifotsy		4,632	2,329	6,961
Antsirabe I		1,587	16,676	18,263
Antsirabe II		12,037	10,020	22,057
Betafo			12,987	12,987
Faratsiho			8,896	8,896
Mandoto			5,208	5,208
Vatovavy Fitovinany	39,889	251,829		291,718
Ifanadiana		46,873		46,873
Ikongo		11,605		11,605
Manakara Atsimo	8,631	95,909		104,540
Mananjary	22,765	58,717		81,482
Nosy-Varika	8,493	18,453		26,946
Vohipeno		20,271		20,271
Total	156,342	795,444	571,425	1,523,210

The population exposure, summarized by Region and District, has been calculated using a 100 m resolution WorldPop dataset. This is a preliminary analysis & has not yet been validated in the field.

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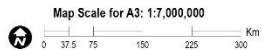
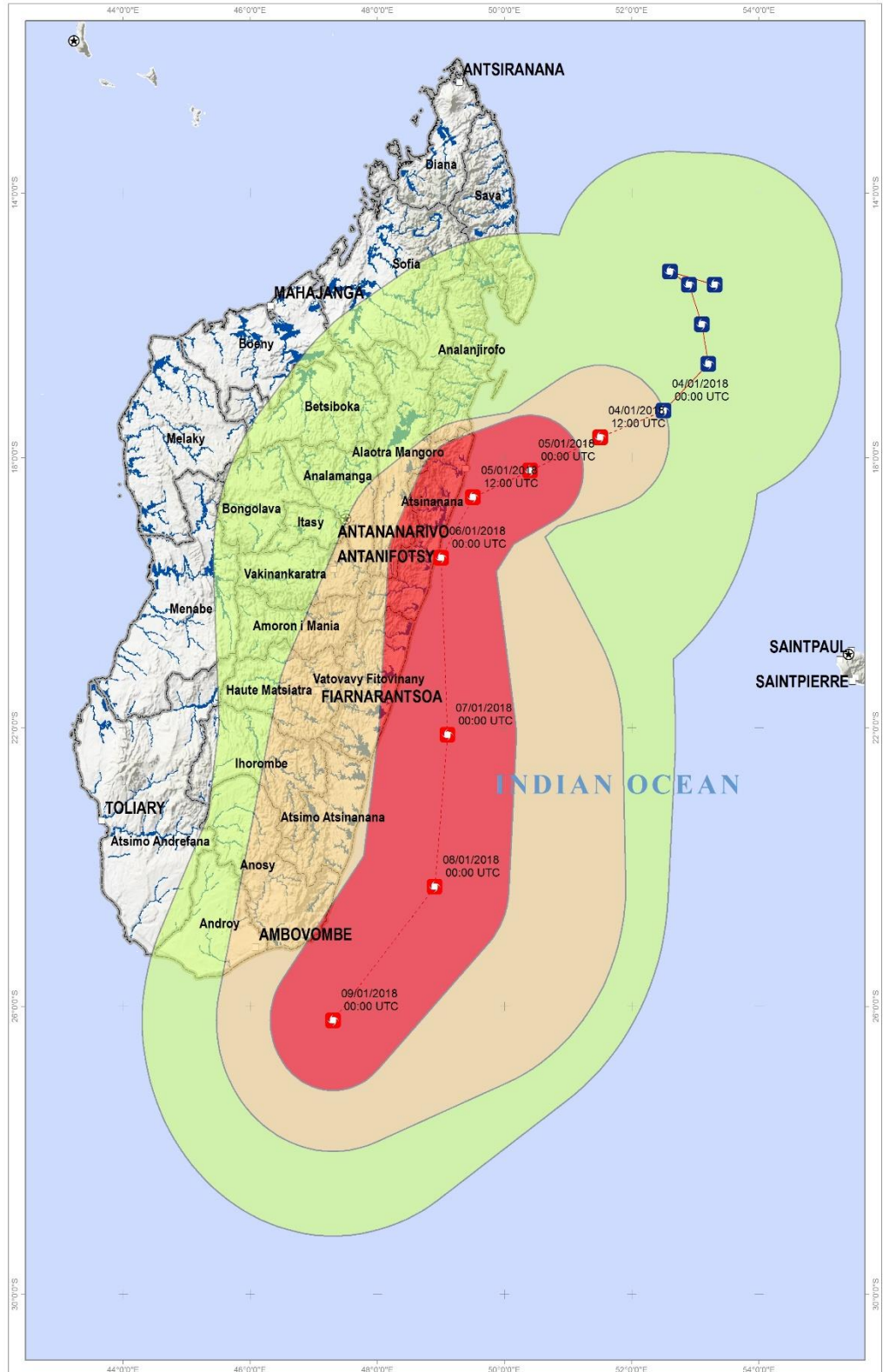


Tropical Cyclone AVA-18: Path and Wind Speed Zones

This map illustrates the observed and predicted path of the tropical cyclone AVA-18 off the coasts of Madagascar as of 4 January 2018 (00:00 UTC). On the map are shown also the wind speed zones from JRC, classified as high (120 km/h), medium (90 km/h) and low (60 km/h) speed. This is a preliminary analysis and has not yet been validated in the field. Please send ground feedback to UNITAR - UNOSAT.

Legend

- Capital
- Predicted position
- Previous position
- Predicted track
- Previous track
- Flood hazard 25 years zones
- Region boundary
- Wind Speed Zones**
- 120 km/h
- 90 km/h
- 60 km/h



Analysis conducted with ArcGIS v10.4.1
 Coordinate System: WGS 1984 Web Mercator
 Auxiliary Sphere
 Projection: Mercator Auxiliary Sphere
 Datum: WGS 1984

Wind Speed Data: JRC
 Date: 04 January 2018 / 00:00 UTC
 Copyright: JRC
 Source: JRC-GDACS

Flood hazard 25 years: GAR Risk Data Platform
 Baseline Data: HDX, GADM
 Analysis: UNITAR - UNOSAT
 Production: UNITAR - UNOSAT

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