

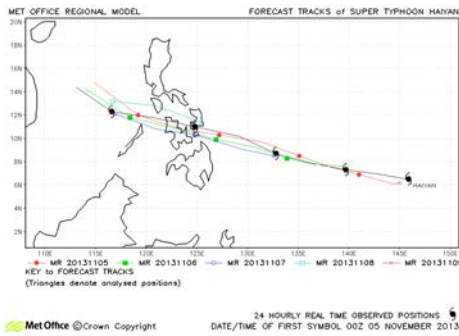

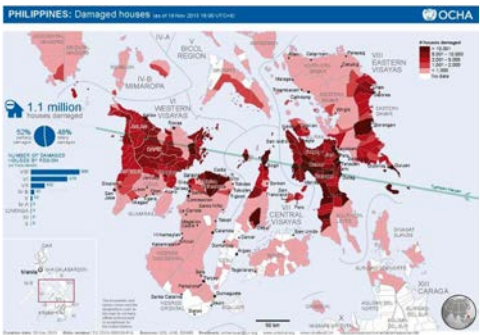
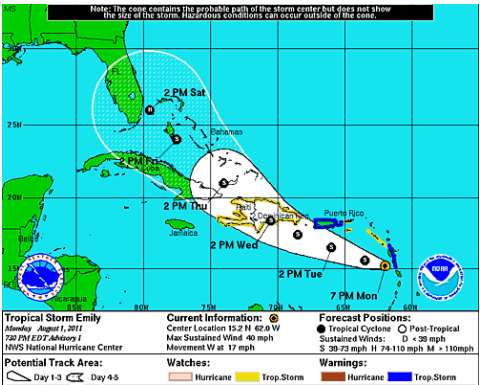




Reconocimiento a los medios de comunicación

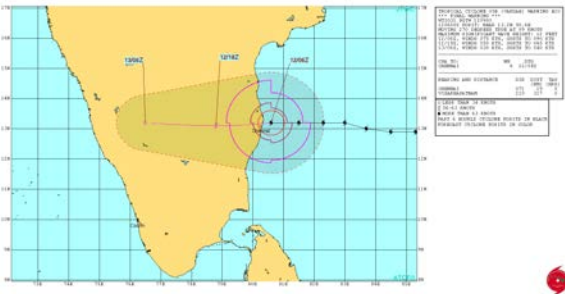

Introducción a los servicios de predicción y aviso que tienen en cuenta los impactos

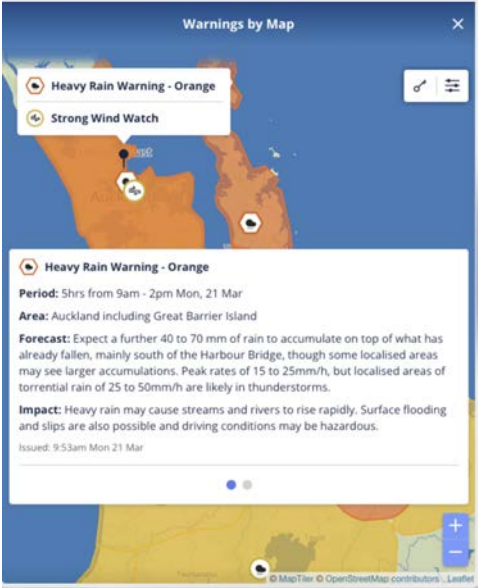

#	Imagen	Título/archivo	Crédito al autor/	La fuente	Licencia/permiso
Module 1: Fundamentals of IBFWS					
1.		960px-Basey_after_Yolanda.JPG	Credit: By Lawrence Ruiz,	https://en.wikipedia.org/wiki/Typhoon_Haiyan#/media/File:Basey_after_Yolanda.JPG	CC BY-SA 4.0, https://commons.wikimedia.org/w/index.php?curid=43911464

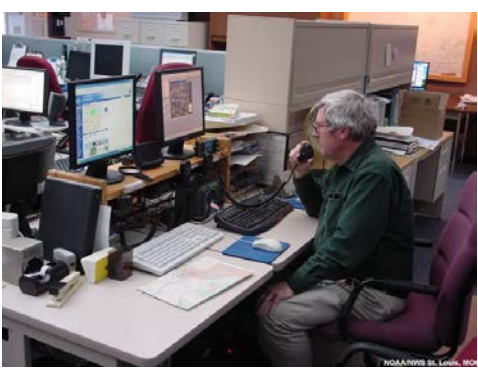
2.		1620px- Philippine_island_of _Binluanguan_Foll owing_Typhoon_Hai yan_MOD_4515647 2.jpg	LPHOT Keith Morgan,	https://commons.wi kimedia.org/w/inde x.php?curid=30512 881	Images are downloadable at high resolution, made available at http://www.defenc eimagery.mod.uk for reuse under the OGL (Open Government License).
3.	 <p>MET OFFICE REGIONAL MODEL FORECAST TRACKS of SUPER TYPHOON HAIYAN</p> <p>KEY to FORECAST TRACKS (Triangles denote analysed positions)</p> <p>24 HOURLY REAL TIME OBSERVED POSITIONS DATE/TIME OF FIRST SYMBOL 00Z 05 NOVEMBER 2013</p> <p>Met Office ©Crown Copyright</p>	Haiyan-forecast- UKMet.gif	UK Met Office	UK Met Office	Permission granted
4.		1080px- Tacloban_Typhoon_ Haiyan_2013-11- 13.jpg	Trocaire, Ireland DSC_0749,	https://commons.wi kimedia.org/w/inde x.php?curid=29660 396	https://creativeco mmons.org/licens es/by-nc/2.0/


<p>5.</p>		<p>ReliefNet_Map_of_Damaged_houses_Typhoon_Haiyan.pdf</p>	<p>ReliefWeb, UN Office for the Coordination of Humanitarian Affairs - See more at: http://reliefweb.int/map/philippines/philippines-damaged-houses-18-nov-2013-1800-utc8#sthash.cEfqVP84.dpuf</p>	<p>https://en.wikipedia.org/wiki/File:Relief_Net_Map_of_Damaged_houses_Typhoon_Haiyan.pdf</p>	<p>Public Domain</p>
<p>6.</p>		<p>Emily2011path233014W5_NL_sm.gif</p>	<p>NOAA/NWS</p>	<p>https://www.nhc.noaa.gov/archive/2011/graphics/al05/loop_5W.shtml</p>	<p>Public domain</p>

7.		<p>Father Carries Daughter to Safety</p> <p>Country Haiti, Port-au-Prince</p> <p>UN_DAM/Haiti - Jeanne storm/2022Feb02 - Library - 0bf.jpg/UN7686194 _0bf_Standard.jpg</p>	<p>UN Photo/Logan Abassi</p>	<p>Unique Identifier UN7686194</p> <p>https://dam.media.un.org/</p>	<p>https://shop.un.org/rights-permissions</p>
8.		<p>Headline: MINUSTAH Peacekeepers Assist Flood Victims in Haiti</p> <p>UN_DAM/Haiti - Jeanne storm/2022Feb02 - Library - 0c0.jpg/UN7686195 _0c0_Low_Resolution.jpg</p>	<p>UN Photo/Logan Abassi</p>	<p>Unique Identifier: UN7686195</p> <p>https://dam.media.un.org/</p>	<p>https://shop.un.org/rights-permissions</p>


9.		JTWC_io0516.gif	Joint Typhoon Warning Center, US Navy	https://upload.wikimedia.org/wikipedia/commons/d/d8/JTWC_io0516.gif	public domain
10.		Meteorologist at Indonesia Meteorological and Geophysical Agency, BMKG	WMO	https://flic.kr/p/EP4xxU	https://creativecommons.org/licenses/by-nc-nd/2.0/

11.		heavyrain-impact-mobile-NZMetSvc21Mar2022.png	NZ MetService	Warnings & Watches page, Meteorological Service of New Zealand, https://www.metservice.com/warnings/home	
12.		pexels-photo-6754173.jpeg	Photo by Pavel Danilyuk	from Pexels	https://www.pexels.com/license/ Free to use



13.		nws_radio.meted.jpg	NOAA/NWS St. Louis, MO	https://www.meted.ucar.edu	COMET Terms of Use https://www.meted.ucar.edu/about_legal.php#C
14.		Forecaster_work.jpg	NOAA	https://www.meted.ucar.edu/	COMET Terms of Use https://www.meted.ucar.edu/about_legal.php#C
15.		5545703979_732654fb1c_h.jpg	Photo by Khalfan Said, U.S. Embassy, Tanzania	https://flic.kr/p/9s4bzR	https://creativecommons.org/licenses/by/2.0/



16.		51102011688_c576512e48_b.jpg	UNDP Climate	https://flic.kr/p/2kRH3	https://creativecommons.org/licenses/by-nc/2.0/
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Module 2: Roadmap to the IBFWS Paradigm

17.		Super_Typhoon_Surigae_near_the_Philippines_-_April_19th,_2021_(51126373195).jpg	Pierre Markuse	https://flickr.com/photos/24998770@N07/51126373195	https://creativecommons.org/licenses/by/2.0/deed.en
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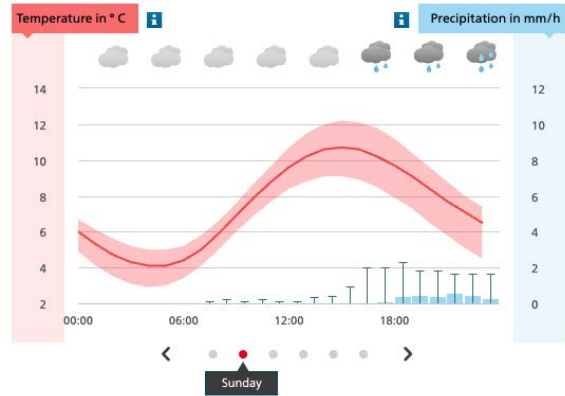
18.		10695722693_9dd99835f2_c.jpg	AusAID	https://flic.kr/p/hi9nHX	https://creativecommons.org/licenses/by/2.0/
19.	 <p data-bbox="449 1133 625 1157">Photo by Lon Goldstein</p>	House by creek	Lon Goldstein		https://creativecommons.org/licenses/by-nd/2.0/

20.		Hurricane-katrina-port-sulphur-la-4-14-06-this-is-a-post-mitigated-home-that-bba139.jpg	Marvin Nauman/FEMA	https://nara.getarchive.net/media/hurricane-katrina-port-sulphur-la-4-14-06-this-is-a-post-mitigated-home-that-bba139	Public domain - FEMA
21.		House 2.jpg House at ground level	Adanna Robertson-Quimby		https://creativecommons.org/licenses/by-nd/2.0/

22.		3883928876_efccf3e42f_o.jpg	Max Barners	https://flic.kr/p/6Vd9JY	https://creativecommons.org/licenses/by-nd/2.0/
23.		Video and stills	COMET/UCAR	https://www.youtube.com/watch?v=W3ghU4e2OKY	COMET Terms of Use https://www.meted.ucar.edu/about_legal.php#C

24.

Genève 381 m a. sea level
Sunday, 13 March 2022



MeteoSuisse-prob-
fcst11Mar2022.png

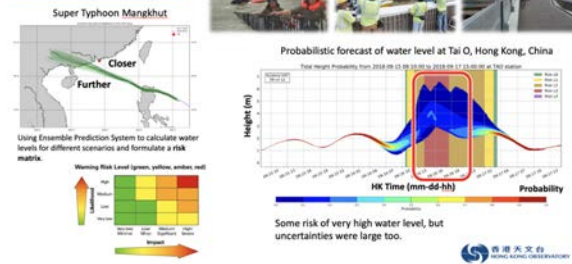
MeteoSwiss

<https://www.meteoswiss.admin.ch/home.html>

Courtesy
MétéoSuisse

25.

**Risk-based storm surge
forecast**

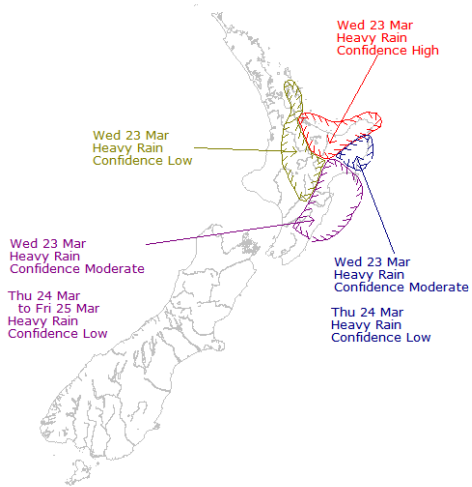


Module3_Q2Q3KKH
1803.pptx

Courtesy Hong
Kong Observatory

26.

Valid Wed 23-Mar-2022 through Sat 26-Mar-2022



Issued 04:27 pm 21-Mar-2022

© Meteorological Service of New Zealand Ltd

HeavyRainProbMap
_NZMetSvc21Mar2
022.png

NZ MetService
Warnings &
Watches page,
Meteorological
Service of New
Zealand,

<https://www.metservice.com/warnings/home>

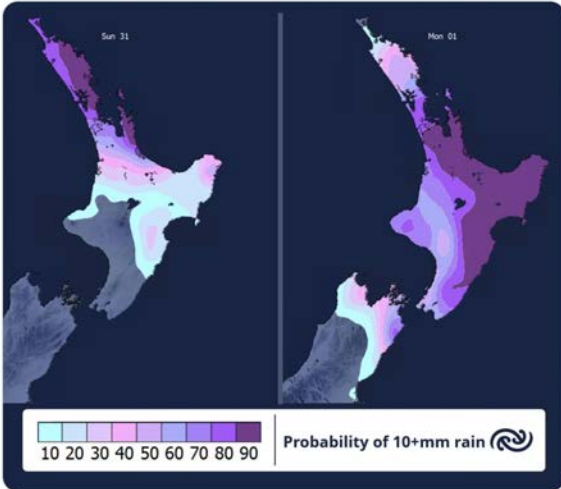
Courtesy
Meteorological
Service of New
Zealand

27.

← Tweet



Across the North Island, most places are likely to see some rain from Sunday. Eastern areas have the highest probability, especially on Monday, with the upper South Island also getting a taste to close out the long weekend. Check out the outlook at bit.ly/SWOutlook ^Tahlia



9:10 PM · May 28, 2020 · TweetDeck

3 Retweets 5 Likes

Tweet-ProbFcst-
NZMetSvc28May20
20.png

NZ MetService
Warnings &
Watches page,
Meteorological
Service of New
Zealand,
<https://www.metservice.com/warnings/home>

Courtesy
Meteorological
Service of New
Zealand

28.

Example of spatial variation in thresholds from the Meteorological and Hydrological Service of Croatia

Temperature thresholds for the heatwave hazard for eight towns in Croatia

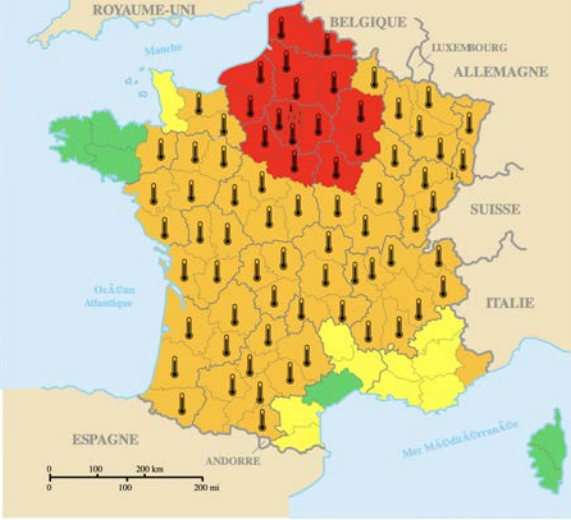
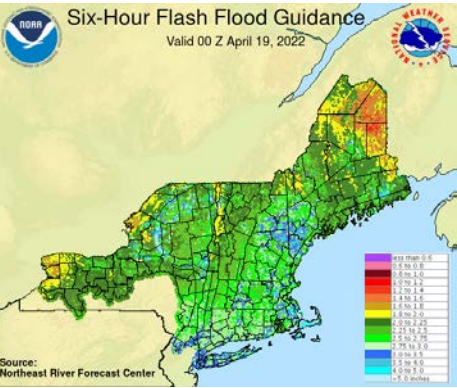
Minimum temperature (°C)				Maximum temperature (°C)			
Osijek	20.1	21.2	22.9	Osijek	35.2	36.7	38.8
Zagreb	20.2	21.3	22.9	Zagreb	33.7	35.1	37.1
Karlovac	20.0	21.1	22.7	Karlovac	34.5	35.9	38.0
Gospić	17.0	18.0	19.6	Gospić	32.1	33.4	35.4
Rijeka	22.7	23.7	25.1	Rijeka	32.7	33.9	35.5
Knin	20.5	21.6	23.1	Knin	35.5	36.9	39.0
Split	25.8	26.8	28.2	Split	33.9	35.1	36.7
Dubrovnik	25.4	26.3	27.6	Dubrovnik	32.3	33.2	34.7



Description of thresholds	
	Moderate heatwave hazard
	High heatwave hazard
	Extreme high heatwave hazard

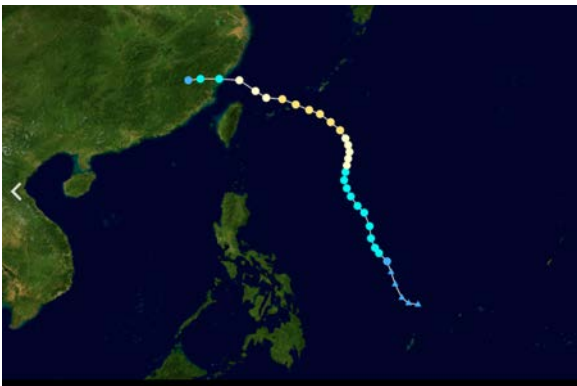
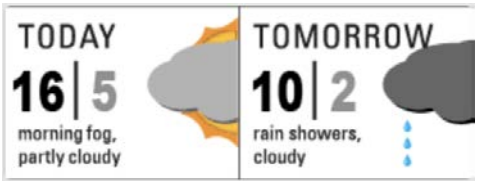

Croatia_thresholds_ example_wmo_115 0_pt1.png



WMO

Guidelines on Multi-hazard Impact-based Forecast and Warning Services
https://library.wmo.int/index.php?lvl=notice_display&id=17257
 Guidelines on Multi-hazard Impact-based Forecast and Warning Services Part II
https://library.wmo.int/index.php?lvl=notice_display&id=21994

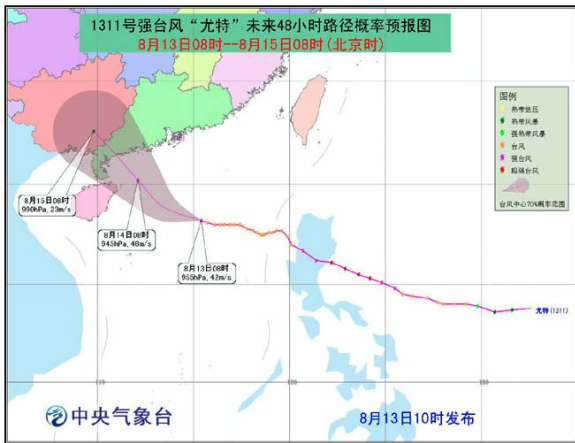
29.		843px-Meteo_France_weather_warning_map_-_24-25.07.2019.svg.png	By User:Ternoc - Own work	https://commons.wikimedia.org/wiki/File:Meteo_France_weather_warning_map_-_24-25.07.2019.svg.png	Public Domain
30.		ffg1_6hr_19Apr2022_00z_NERFC.png	NOAA/NWS	https://www.weather.gov/serfc/ffg	Public domain

31.	<p>Early Warning System for Extreme Heat Temperatures (SAT-TE Calor) Argentinian National Meteorological Service - 13 January, 2022 18:32h</p>  <p>Effect on Health</p> <ul style="list-style-type: none"> ■ Red: High to extreme. Very dangerous. Can affect everyone, even the healthy. ■ Orange: Moderate to high. Can be very dangerous, especially for risk groups. ■ Yellow: Mild to moderate. Can be dangerous, especially for risk groups, such as young children, those older than 65 years and people with chronic illness. ■ Green: No effect on health. No danger to the health of the population. <p>https://www.smn.gobar.modelos</p>	Argentina_heatwave_13jan20221838h.png	Modified from source	https://www.smn.gobar.modelos	Credit: Courtesy Argentinian National Meteorological Service
32.		Edited ISS037 image of Typhoon Fitow, close to Taiwan. 10105483996_34146e76aa_c.jpg	Stuart Rankin	https://flic.kr/p/goZfjG	https://creativecommons.org/licenses/by-nc/2.0/

33.		1165px-Fitow_2013_track.png	Meow, Background image NASA/. Tracking data Joint Typhoon Warning Center	https://en.wikipedia.org/wiki/Typhoon_Fitow#/media/File:Fitow_2013_track.png	Public domain
34.		forecast-today_and_tomorrow.png	Parhamr	https://commons.wikimedia.org/wiki/File:Newspaper_weather_forecast_today_and_tomorrow.svg	https://creativecommons.org/licenses/by-sa/3.0
35.		Storm-843732_1280.jpg	Reslmaier,	https://www.needpix.com/photo/410098/	public domain

36.		AftermathBertha-4123970_67291d76.jpeg	John Lucas	https://www.geograph.org.uk/photo/4123970	https://creativecommons.org/licenses/by-sa/2.0/
37.		864px-Utor_2013-08-11_0515Z.jpg	Jeff Schmaltz, LANCE/EOSDIS MODIS Rapid Response Team, NASA GSFC	http://earthobservatory.nasa.gov/NaturalHazards/view.php?id=81837 , Public Domain, https://commons.wikimedia.org/w/index.php?curid=27658452	Public domain

38.



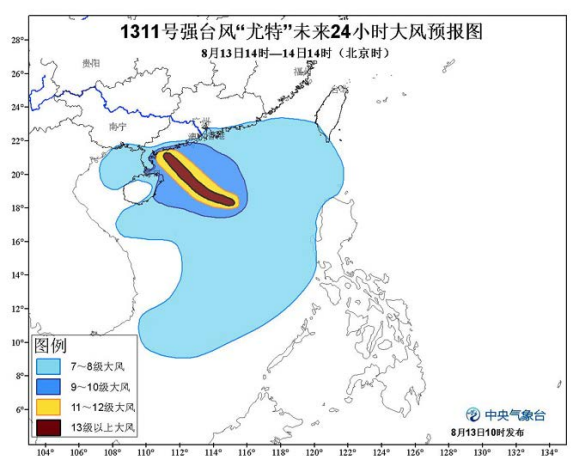
typhoon_utor_track_fcst_cma-aug2013.jpeg

China Meteorological Administration

http://www.cma.gov.cn/en2014/news/News/201408/t20140812_255794.html

Courtesy of China Meteorological Administration

39.



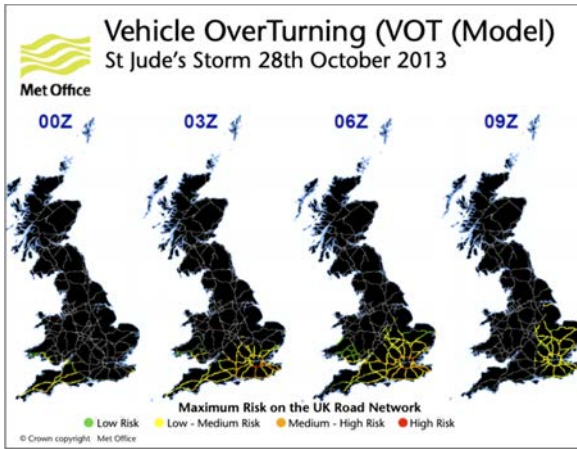
typhoon_utor_impact_fcst_cma-aug2013.jpeg

China Meteorological Administration

http://www.cma.gov.cn/en2014/news/News/201408/t20140812_255794.html

Courtesy of China Meteorological Administration

40.



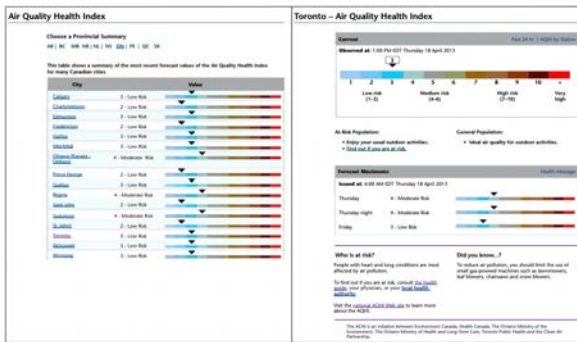
UK_VOT_model_stJudes28Oct2013.png

UK Met Service

Guidelines on Multi-hazard Impact-based Forecast and Warning Services
https://library.wmo.int/index.php?lvl=notice_display&id=17257
 Guidelines on Multi-hazard Impact-based Forecast and Warning Services Part II
https://library.wmo.int/index.php?lvl=notice_display&id=21994

Courtesy UK Met Service

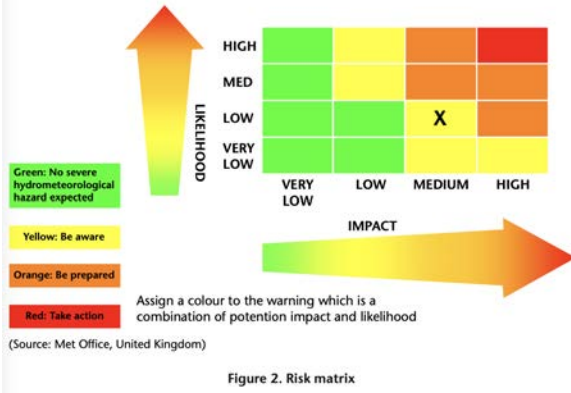
41.



air_quality_Env_Canada.png

https://weather.gc.ca/airquality/pages/index_e.html

42.



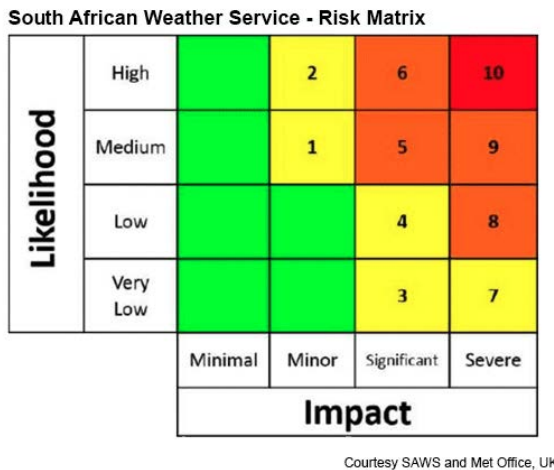
risk_matrix_metoffice_UK.png

UK Met Service

Guidelines on Multi-hazard Impact-based Forecast and Warning Services
https://library.wmo.int/index.php?lvl=notice_display&id=17257
 Guidelines on Multi-hazard Impact-based Forecast and Warning Services Part II
https://library.wmo.int/index.php?lvl=notice_display&id=21994


Courtesy UK Met Service

43.




SAWS_risk.png

Courtesy SAWS and Met Office, UK

44.	<p>BMKG Indonesia Risk Matrix</p>  <p>Courtesy BMKG and Met Office, UK</p>	BMKG-Indonesia_risk.png			Courtesy BMKG and Met Office, UK

Module 3: Best Practises for Collaboration and Strategic Partnerships in IBFWS

45.			Photo by Denniz Futalan from Pexels		
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46.



Photo by [RF. .studio](#) from [Pexels](#)

47.



Photo by [Matheus Bertelli](#) from [Pexels](#)

48.



Photo by [cottonbro](#) from [Pexels](#)

49.



Photo by [Harrison Haines](#) from [Pexels](#)

50.



Photo by [RODNAE Productions](#) from [Pexels](#)

51.



Photo by [Markus Spiske](#) from [Pexels](#)

52.

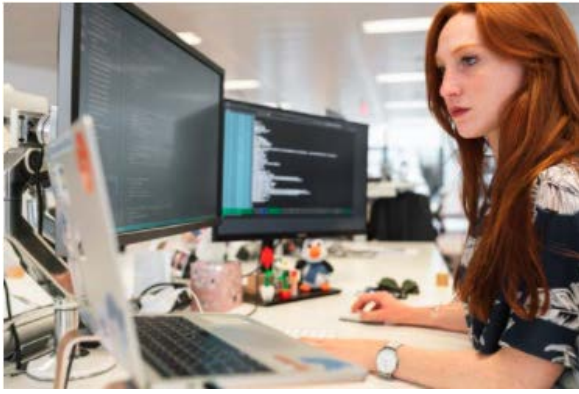


Photo by [ThisIsEngineering](#) from [Pexels](#)

53.



Photo by Yan Krukov from Pexels

54.



Figure 3. United Kingdom Natural Hazards Partnership




Met Office UK



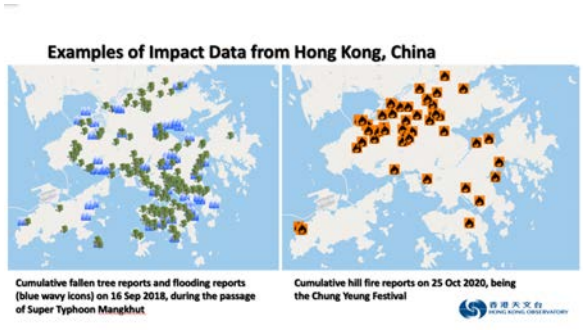
WMO Guidelines on Multi-hazard Impact-based Forecast and Warning Services Part II: Putting Multi-hazard IBFWS into Practice
https://library.wmo.int/index.php?lvl=notice_display&id=21994

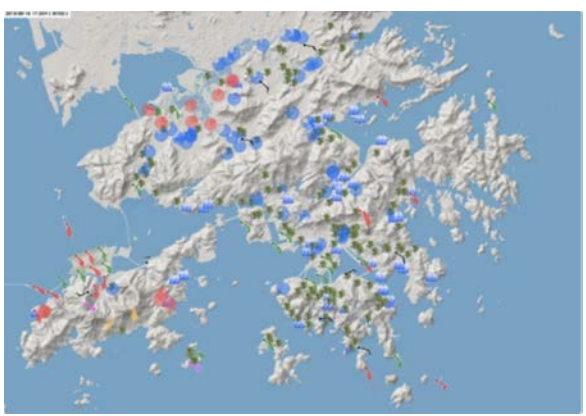


Courtesy Met Office UK

<p>55.</p>	<p>Resolution / Update Interval / Lead Time: 1 km/10 min/2 hours 1 km/10 min/1 hour 1 km/10 min/3 hours</p> <p>Risk Map Rain-Now Flood Risk Map</p> <ul style="list-style-type: none"> High: Extreme risk [Level 4 eq.] High: High-risk [Level 3 eq.] Warning: Warning [Level 2 eq.] Caution: Caution [Level 2 eq.] Low: Low Check weather bulletin <p>Flood Warnings and Advisories for designated rivers</p> <ul style="list-style-type: none"> High: Information on flooding [Level 4 eq.] High: Information on potential flooding [Level 4 eq.] Warning: Warning on flooding [Level 3 eq.] Warning: Information to provide attention to flooding [Level 3 eq.] Low: Information to call attention to flooding [Level 2 eq.] Low: Check weather bulletin 	<p>JMA_Real-time_Risk_Map_modified.png</p>	<p>JMA</p>	<p>Japan Meteorological Agency (JMA)</p>	<p>Courtesy Japan Meteorological Agency (JMA)</p>
<p>56.</p>		<p>forecaster_work.jpg</p>	<p>NOAA</p>	<p>https://www.meted.ucar.edu/</p>	<p>COMET Terms of Use https://www.meted.ucar.edu/about_legal.php#C</p>

57.		pexels-pixabay-260367.jpg	Pixabay	Photo by Pixabay from Pexels: https://www.pexels.com/photo/accident-action-danger-emergency-260367/	public domain,cco
58.			Photo by ThisIsEngineering from Pexels		

59.		imet_coordinate.jpeg	NOAA/NWS	https://www.meted.ucar.edu/	COMET Terms of Use https://www.meted.ucar.edu/about_legal.php#C
60.		nws_fire_desk_NW S.meted.jpg	NOAA/NWS Tallahassee, FL	https://www.meted.ucar.edu/	COMET Terms of Use https://www.meted.ucar.edu/about_legal.php#C
61.		start_burn.jpeg	Brent Lawrence, USFWS	https://www.meted.ucar.edu/fire/sitrep/media/graphics/start_burn.jpg	COMET Terms of Use https://www.meted.ucar.edu/about_legal.php#C

62.		DBK_FOC_3554_01_13_2017a.jpg	California Department of Water Resources	https://pixel-ca-dwr.photoshelter.com/index	public domain - per Ryan Endean, Assistant Deputy Director, Public Affairs Office, California Department of Water Resources (DWR), ryan.endean@water.ca.gov)
63.			Photo by Mikhail Nilov from Pexels		
64.	 <p>Examples of Impact Data from Hong Kong, China</p> <p>Cumulative fallen tree reports and flooding reports (blue wavy icons) on 16 Sep 2018, during the passage of Super Typhoon Mangkhut</p> <p>Cumulative hill fire reports on 25 Oct 2020, being the Chung Yeung Festival</p> <p>香港天文台 HONG KONG OBSERVATORY</p>	Impact_data_chart_KKH1803.pptx	Hong Kong Observatory (HKO)		Courtesy Hong Kong Observatory (HKO)

65.		GIS_ImpactData_m angkhut.png		<p>WMO Guidelines on Multi-hazard Impact-based Forecast and Warning Services Part II: Putting Multi-hazard IBFWS into Practice</p> <p>https://library.wmo.int/index.php?lvl=notice_display&id=21994</p>	
66.			Photo by Manuel Geissinger from Pexels		
67.			Photo by Yan Krukov from Pexels		

68.



Photo by [Christina Morillo](#) from [Pexels](#)

69.








Photo by [fauxels](#) from [Pexels](#)



70.







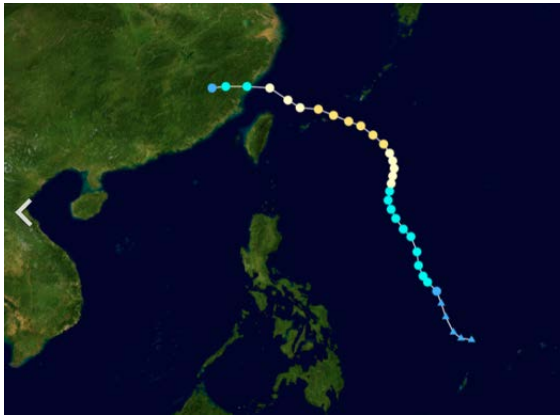
Photo by [Canva Studio](#) from [Pexels](#)



71.		IMG_2145.JPG	UK Met Office	UK Met Office	Permission granted
72.		KJ_oro_ville_FERC_0452_08_07_19.JPG G	California Department of Water Resources	https://pixel-ca-dwr.photoshelter.com/index	public domain - per Ryan Endean, Assistant Deputy Director, Public Affairs Office, California Department of Water Resources (DWR), ryan.endean@water.ca.gov
73.			Photo by fauxels from Pexels		

74.			<p>Photo by Tima Miroshnichenko from Pexels</p>		
75.		<p>fcst-action-game-UKMet.png</p>	<p>Met Office, UC</p>	<p>https://understandrisk.org/wp-content/uploads/FB-EA-Game-v5-1.pdf</p>	<p>Met Office, UC</p>

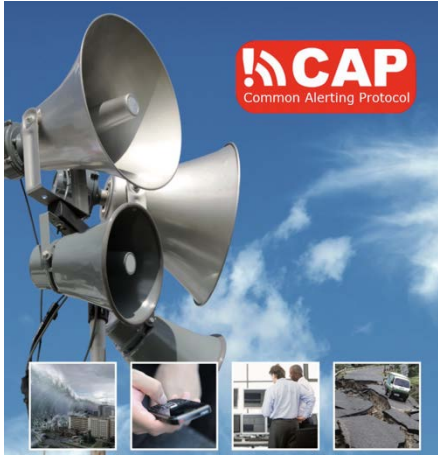
76.		P1012655.JPG	UK Met Office	UK Met Office	Permission granted
77.			Photo by ICSA from Pexels		
Module 4: Effective Communications Strategies for Impacts-Based Warnings					

78.		Traffic_direction_station.png	U.S. Army National Guard photo by Capt. Brendan Mackie	https://nara.getarchive.net/	public domain
79.		Disaster_center_manager_fema.png	Jocelyn Augustino/FEMA		Public domain
80.		road_repair_crew.png			public domain

81.		Downed_Power_Lines_(17157695726)(1).jpg	Tony Webster		https://creativecommons.org/licenses/by/2.0/deed.en
82.		Snow_road.jpg	NSSL NOAA	https://www.meted.ucar.edu/	COMET Terms of Use https://www.meted.ucar.edu/about_legal.php#C
83.		1920px-Fitow_2013_track.png	By Meow - Created by Meow using WikiProject Tropical cyclones/Tracks. The background image is from NASA. Tracking data is from the Joint Typhoon Warning Center[1]	https://en.wikipedia.org/wiki/Typhoon_Fitow#/media/File:Fitow_2013_track.png https://commons.wikimedia.org/w/index.php?curid=28812172	Public Domain

84.		TADDHighRes-sm.gif	NWS NOAA	https://www.weather.gov/safety/flood-turn-around-dont-drown	Public domain
85.		14197246562_626339166f_o.jpg	Fairfax County	https://flic.kr/p/nCyAM9	https://creativecommons.org/licenses/by-nc-nd/2.0/

86.



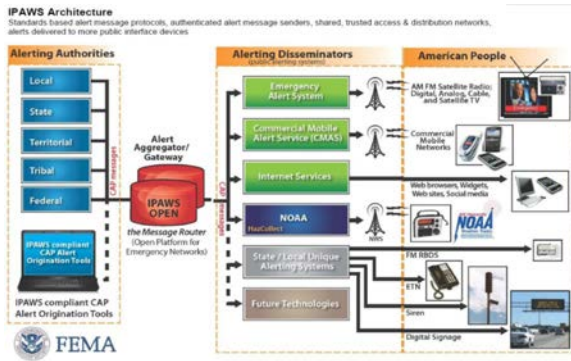
CAPcoverimage.jpg

WMO

<https://etrp.wmo.int/course/view.php?id=157>

<https://creativecommons.org/licenses/by-sa/4.0/>

87.

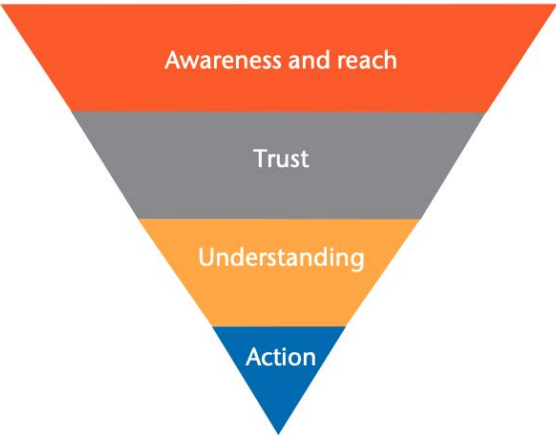




IPAWS-US-CAP-diagram.png

FEMA

<https://etrp.wmo.int/course/view.php?id=157>

Public domain


88.		REACH_model.png		<p>Guidelines on Multi-hazard Impact-based Forecast and Warning Services Part II</p> <p>https://library.wmo.int/index.php?lvl=notice_display&id=21994</p>	
89.	<p>← Tweet</p> <p> MetService @MetService</p> <p>Hot again for many parts of the country. Many people are struggling with this prolonged heat , but don't forget our pets and livestock! More temperature information at MetService.com ^Lisa</p>  <p>2:57 PM · Jan 30, 2019 · TweetDeck</p>	NZTweet-seasonal-1-30Jan2019.png	Courtesy Meteorological Service of New Zealand	NZ MetService	Courtesy Meteorological Service of New Zealand

90.

← Tweet

MetService
@MetService

With temperatures spiking around the country it pays to keep a few things in mind about dealing with the heat. Here's some advice for the family, and don't forget about your pets and animals! ^AH



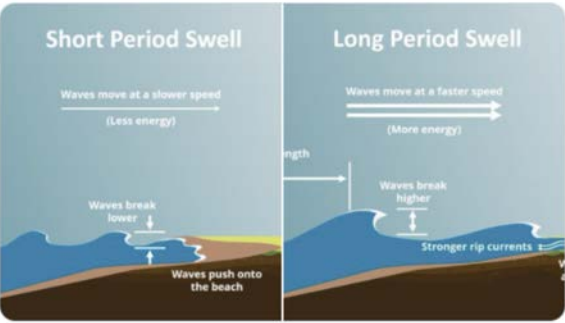

6:05 PM · Jan 27, 2019 · TweetDeck



NZTtweet-seasonal-2-27Jan2019.png


Courtesy
Meteorological
Service of New
Zealand

NZ MetService

Courtesy
Meteorological
Service of New
Zealand

<p>91.</p>	<p>← Tweet</p> <p> MetService @MetService</p> <p>Following the inclement weather this week, significant swells are forecast. With our new marine forecasts released last week, we now forecast swell period when greater than 10s. Check the info-graphics to see why this is important! ^Tui</p>  <p>10:25 PM · Sep 25, 2020 · TweetDeck</p> <p>6 Retweets 1 Quote Tweet 23 Likes</p>	<p>NZTweet-seasonal-explainer-3-25Sept2019.png</p>	<p>Courtesy Meteorological Service of New Zealand</p>	<p>NZ MetService</p>	<p>Courtesy Meteorological Service of New Zealand</p>
<p>92.</p>		<p>winter-ready-ireland.png</p>		<p>https://www.gov.ie/en/publication/3670b1-be-winter-ready/</p> <p>Guidelines on Multi-hazard Impact-based Forecast and Warning Services Part II</p> <p>https://library.wmo.int/index.php?lvl=no</p>	

				tice_display&id=21994	
93.			MetService New Zealand	https://fb.watch/bTNpDkSvzO/	
94.	 <p>Ocean Buoy Awareness - Solomon Islands Pijin</p>	Ocean Buoys	WMO	https://www.youtube.com/playlist?list=PLNaX-uTWSWrHr554n5hLdemL-idLcefMq	

95.	 <p>The thumbnail shows a woman with dark skin and curly hair, wearing a green patterned top and a white necklace, sitting at a desk with a green radio. A speech bubble above the radio says "DANGEROUS STORM IS COMING!". Below the woman, there is a subtitle in Bislama: "taem we yu save ee wan Storm i stap kam?". The text "Coastal Inundation Awareness - Bislama" is at the bottom of the image.</p>	Coastal Inundation	WMO	https://www.youtube.com/playlist?list=PLNaX-uTWSWrGZ4yEMaYyv4o2SiQT20nsz	
#	Thumbnail	Title/File	Author/Credit	Source	License/Permission