



Rural Training Center-THailand Mobile Emergency Weather Station: Technical Paper

MEWS: Basic Level Introduction

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MEWS (Mobile Emergency Weather Station) is an emergency weather observing system operated under the RTC-TH EmComm (Rural Training Center-THailand Emergency Communications) program. During times of local emergency, MEWS can provide on-scene weather observations and reports to emergency services and disaster relief agencies and responders.

Basic level observations use a minimum of equipment. This makes the system robust, reliable, and able to work in the basic chaotic environment of a disaster zone. The equipment can be carried in a backpack enabling transport to the site by foot, bicycle, motor bike or other means. No external or battery power is required. **Note:** As in many outdoor activities, a “buddy” system is highly recommended. It is often best to work in 2-person teams rather than to work alone. It is standard operating procedure to inform others of where you plan to go and when you plan to return, and possible alternative routes/places you would use for emergencies.



Beaufort Wind Table for Land Effects

MEWS weather observers should set up a wind sock or flag near their operating position. Use the Description and Flag references to estimate the wind speed. Report the range of wind speeds from the chart rather than a specific number.

Description	Flag	Wind speed (km/h)	Wind speed (mph)	Force	Flag Rating #
Calm, smoke rises vertically	---	0-0.5	0-0.5	0	0.00000
Smoke indicates wind, flag flutters	Light air	0.5-1.5	1-3	1	0.00000
Wind felt on face, leaves rustle, flag flutters	Light breeze	1.6-3.3	4-7	2	0.00000
Leaves and twigs in constant motion, flag extends	Light breeze	3.4-5.1	8-11	3	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	5.2-6.9	12-15	4	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	7.0-8.7	16-19	5	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	8.8-10.5	20-23	6	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	10.6-12.3	24-27	7	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	12.4-14.1	28-31	8	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	14.2-15.9	32-35	9	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	16.0-17.7	36-39	10	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	17.8-19.5	40-43	11	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	19.6-21.3	44-47	12	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	21.4-23.1	48-51	13	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	23.2-24.9	52-55	14	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	25.0-26.7	56-59	15	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	26.8-28.5	60-63	16	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	28.6-30.3	64-67	17	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	30.4-32.1	68-71	18	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	32.2-33.9	72-75	19	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	34.0-35.7	76-79	20	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	35.8-37.5	80-83	21	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	37.6-39.3	84-87	22	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	39.4-41.1	88-91	23	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	41.2-42.9	92-95	24	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	43.0-44.7	96-99	25	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	44.8-46.5	100-103	26	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	46.6-48.3	104-107	27	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	48.4-50.1	108-111	28	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	50.2-51.9	112-115	29	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	52.0-53.7	116-119	30	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	53.8-55.5	120-123	31	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	55.6-57.3	124-127	32	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	57.4-59.1	128-131	33	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	59.2-60.9	132-135	34	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	61.0-62.7	136-139	35	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	62.8-64.5	140-143	36	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	64.6-66.3	144-147	37	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	66.4-68.1	148-151	38	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	68.2-69.9	152-155	39	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	70.0-71.7	156-159	40	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	71.8-73.5	160-163	41	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	73.6-75.3	164-167	42	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	75.4-77.1	168-171	43	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	77.2-78.9	172-175	44	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	79.0-80.7	176-179	45	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	80.8-82.5	180-183	46	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	82.6-84.3	184-187	47	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	84.4-86.1	188-191	48	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	86.2-87.9	192-195	49	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	88.0-89.7	196-199	50	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	89.8-91.5	200-203	51	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	91.6-93.3	204-207	52	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	93.4-95.1	208-211	53	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	95.2-96.9	212-215	54	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	97.0-98.7	216-219	55	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	98.8-100.5	220-223	56	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	100.6-102.3	224-227	57	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	102.4-104.1	228-231	58	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	104.2-105.9	232-235	59	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	106.0-107.7	236-239	60	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	107.8-109.5	240-243	61	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	109.6-111.3	244-247	62	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	111.4-113.1	248-251	63	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	113.2-114.9	252-255	64	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	115.0-116.7	256-259	65	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	116.8-118.5	260-263	66	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	118.6-120.3	264-267	67	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	120.4-122.1	268-271	68	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	122.2-123.9	272-275	69	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	124.0-125.7	276-279	70	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	125.8-127.5	280-283	71	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	127.6-129.3	284-287	72	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	129.4-131.1	288-291	73	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	131.2-132.9	292-295	74	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	133.0-134.7	296-299	75	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	134.8-136.5	300-303	76	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	136.6-138.3	304-307	77	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	138.4-140.1	308-311	78	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	140.2-141.9	312-315	79	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	142.0-143.7	316-319	80	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	143.8-145.5	320-323	81	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	145.6-147.3	324-327	82	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	147.4-149.1	328-331	83	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	149.2-150.9	332-335	84	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	151.0-152.7	336-339	85	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	152.8-154.5	340-343	86	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	154.6-156.3	344-347	87	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	156.4-158.1	348-351	88	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	158.2-159.9	352-355	89	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	160.0-161.7	356-359	90	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	161.8-163.5	360-363	91	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	163.6-165.3	364-367	92	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	165.4-167.1	368-371	93	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	167.2-168.9	372-375	94	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	169.0-170.7	376-379	95	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	170.8-172.5	380-383	96	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	172.6-174.3	384-387	97	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	174.4-176.1	388-391	98	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	176.2-177.9	392-395	99	0.00000
Small twigs and leaves in motion, flag extends	Light breeze	178.0-179.7	396-399	100	0.00000

Basic equipment consists of a thermometer, magnetic compass, 3 basic reference charts.

Term	Amount of blue	Amount of cloud
Clear	Nearly all blue	Little or no clouds
Scattered clouds	Mostly blue	Some clouds
Broken clouds	Big blue patches	Mostly clouds
Cloudy	Some blue	Mostly clouds
Overcast	Little or no blue	Nearly all clouds

The Basic MEWS equipment is shown above and to the left. Some optional equipment can be used to enhance the Basic level observations. These are shown below. However, these are NOT required to make Basic observations.

Basic MEWS observations are recorded and reported following the standard MEWS format. [**Note:** Gray areas block out the areas of the form NOT used by a Basic level observer.] One of the important functions is providing

on-scene flight weather conditions to emergency relief air crews.



Optional Equipment include an umbrella, a flag or wind streamer, local area topographic maps and binoculars

The Basic observations are:

- Measured temperature
- Estimated Wind speed
- Estimated Wind direction
- Estimated Cloud cover
- Estimated Cloud-base height
- Cloud type
- Estimated Visual Range
- Severe Storms

These observations do not require calculations. These observations do not replace standard aviation weather stations and observers. In many disasters, there may be no weather reports available inside the disaster zone. So although these observations are subjective, the weather data can be useful for air crews and for emergency relief planning and coordination.

The Observation form is designed as a teaching aid and guides the observer as to how to make the observations. With a minimum amount of training (~2-3 hours), Basic MEWS observers can be ready to work. The ideal situation is to

have 2 Hams (licensed amateur radio operator) trained for Basic MEWS duties. Alternatively, a MEWS observer could team up with a Ham.

M.E.W.S. Thailand Emergency Weather Station Ready to serve and sustain our community.		RTC-TH M.E.W.S. Weather Observation Log										
Header		Location										
1. Header		Lat ° ' " N		Long ° ' " E		Elev m AMSL						
Date		Weather Observations Time										
Local time 24-hr format		Hour →		Sunrise		Mid-Afternoon		Sunset				
Observer (initial; see back)												
2. Temperature / Relative Humidity	2.1 Air (Dry bulb)	Thermometer in shade: 1.5 m above ground		°C		°C		°C				
	2.2 Wet Bulb			°C		°C		°C				
	2.3 Difference	Subtract 2.2 from 2.1;		°C		°C		°C				
	2.4 Rel. Humidity	Use 2.1, 2.3; R H Table		%RH		%RH		%RH				
	2.5 Dew Point	Use 2.1, 2.3; Dew Pt Table		°C		°C		°C				
2.6 Heat Stress	Use 2.1, 2.4; HSI Table		Heat Stress °C		Heat Stress °C		Heat Stress °C					
	Danger Level (if any from Heat Stress Index table)		<input type="checkbox"/> Caution <input type="checkbox"/> Danger <input type="checkbox"/> Ex Caution <input type="checkbox"/> Ex Danger		<input type="checkbox"/> Caution <input type="checkbox"/> Danger <input type="checkbox"/> Ex Caution <input type="checkbox"/> Ex Danger		<input type="checkbox"/> Caution <input type="checkbox"/> Danger <input type="checkbox"/> Ex Caution <input type="checkbox"/> Ex Danger					
	Use 2.1, 3.1; Wind Chl Tbl		Wind Chill °C		Wind Chill °C		Wind Chill °C					
2.7 Wind Chill	Danger Level (if any from Wind Chill chart)		<input type="checkbox"/> Trvl Dngr <input type="checkbox"/> Fstble10 <input type="checkbox"/> TShltr Dgr <input type="checkbox"/> Fstble30 <input type="checkbox"/> Frostbite <input type="checkbox"/> Frostbite5		<input type="checkbox"/> Trvl Dngr <input type="checkbox"/> Fstble10 <input type="checkbox"/> TShltr Dgr <input type="checkbox"/> Fstble30 <input type="checkbox"/> Frostbite <input type="checkbox"/> Frostbite5		<input type="checkbox"/> Trvl Dngr <input type="checkbox"/> Fstble10 <input type="checkbox"/> TShltr Dgr <input type="checkbox"/> Fstble30 <input type="checkbox"/> Frostbite <input type="checkbox"/> Frostbite5					
3. Wind Speed / Direction	Report wind speed in knots to air crews ; km/h to all others.											
	Average	Get 3 readings & average		km/h		knts		km/h		knts		
	Gusts	Record highest gust		km/h		knts		km/h		knts		
	Wind Speed Guidelines for Helicopter Flight Operations 10 knots / 18.5 km/h ideal; OK to fly Above 45 knots / 83 km/h; No flights. Gusts above 20 knots/ 37 km/h; No flights Max tailwind 5 knots/ 6 km/h; No take off											
3.2	Steady Wind Direction	Circle direction steady wind comes FROM		N NE S SW E SE W NW		N NE S SW E SE W NW		N NE S SW E SE W NW				
3.2	Variable Wind Direction	Circle 1 or more directions wind comes FROM		N NE S SW E SE W NW		N NE S SW E SE W NW		N NE S SW E SE W NW				
4. Sky Conditions	4.1 Cloud Cover	Use Definitions in Cloud Cover Table		<input type="checkbox"/> Clear <input type="checkbox"/> Cloudy <input type="checkbox"/> Scattered <input type="checkbox"/> Overcast <input type="checkbox"/> Broken		<input type="checkbox"/> Clear <input type="checkbox"/> Cloudy <input type="checkbox"/> Scattered <input type="checkbox"/> Overcast <input type="checkbox"/> Broken		<input type="checkbox"/> Clear <input type="checkbox"/> Cloudy <input type="checkbox"/> Scattered <input type="checkbox"/> Overcast <input type="checkbox"/> Broken				
	4.2 Cloud Base Ht (Loc Rel)	Use local mountain of known elevation (above mean sea level) and report clouds above, at, or below mountain top.		Relative to local Mtn		<input type="checkbox"/> Clouds above mtn <input type="checkbox"/> Clouds at mtn top <input type="checkbox"/> Clouds below mtn		<input type="checkbox"/> Clouds above mtn <input type="checkbox"/> Clouds at mtn top <input type="checkbox"/> Clouds below mtn		<input type="checkbox"/> Clouds above mtn <input type="checkbox"/> Clouds at mtn top <input type="checkbox"/> Clouds below mtn		
			m AMSL		m AMSL		m AMSL		m AMSL			
			Dew-Ext (1A+SE10)+1000m		m AGL		m AGL		m AGL			
	Min. flight altitudes: Day - 160m AGL; Night - 500 m AGL; Low cloud ceiling - No flights.											
	4.3 Cloud Type	High	Vertically Developed	<input type="checkbox"/> Cirrus <input type="checkbox"/> CuNim <input type="checkbox"/> Altostrat <input type="checkbox"/> Altostrat <input type="checkbox"/> Altocum <input type="checkbox"/> Altocum		<input type="checkbox"/> Cirrus <input type="checkbox"/> CuNim <input type="checkbox"/> Altostrat <input type="checkbox"/> Altostrat <input type="checkbox"/> Altocum <input type="checkbox"/> Altocum		<input type="checkbox"/> Cirrus <input type="checkbox"/> CuNim <input type="checkbox"/> Altostrat <input type="checkbox"/> Altostrat <input type="checkbox"/> Altocum <input type="checkbox"/> Altocum				
	4.3 Cloud Type	Middle	Vertically Developed	<input type="checkbox"/> Stratus <input type="checkbox"/> Stratus <input type="checkbox"/> Nimstrat <input type="checkbox"/> Nimstrat		<input type="checkbox"/> Stratus <input type="checkbox"/> Stratus <input type="checkbox"/> Nimstrat <input type="checkbox"/> Nimstrat		<input type="checkbox"/> Stratus <input type="checkbox"/> Stratus <input type="checkbox"/> Nimstrat <input type="checkbox"/> Nimstrat				
	4.3 Cloud Type	Low	Vertically Developed	<input type="checkbox"/> Cumul <input type="checkbox"/> Cumul <input type="checkbox"/> Cumul <input type="checkbox"/> Cumul		<input type="checkbox"/> Cumul <input type="checkbox"/> Cumul <input type="checkbox"/> Cumul <input type="checkbox"/> Cumul		<input type="checkbox"/> Cumul <input type="checkbox"/> Cumul <input type="checkbox"/> Cumul <input type="checkbox"/> Cumul				
	4.4 Rainfall	Measure at 0900 hrs each morning. Report amount for last 24 hrs.										
	4.5 Visual Range (Visibility)	Name of 3.2 km mark		<input type="checkbox"/> more <input type="checkbox"/> less than <input type="checkbox"/> Rain <input type="checkbox"/> Fog <input type="checkbox"/> Haze <input type="checkbox"/> Smoke		<input type="checkbox"/> more <input type="checkbox"/> less than <input type="checkbox"/> Rain <input type="checkbox"/> Fog <input type="checkbox"/> Haze <input type="checkbox"/> Smoke		<input type="checkbox"/> more <input type="checkbox"/> less than <input type="checkbox"/> Rain <input type="checkbox"/> Fog <input type="checkbox"/> Haze <input type="checkbox"/> Smoke				
4.6 Severe Weather	Thunderstorms		<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N NE E SE S SW W NW <input type="checkbox"/> Yes <input type="checkbox"/> km		<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N NE E SE S SW W NW <input type="checkbox"/> Yes <input type="checkbox"/> km		<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N NE E SE S SW W NW <input type="checkbox"/> Yes <input type="checkbox"/> km					
	Lightning		Flash, count secs to boom / 3		<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N NE E SE S SW W NW <input type="checkbox"/> Yes <input type="checkbox"/> km		<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N NE E SE S SW W NW <input type="checkbox"/> Yes <input type="checkbox"/> km					
	Warn air crews of any severe weather in your area.											

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MEWS training is available to any interested community volunteer free of charge. There is no minimum age requirement. The training can be done in small groups or over the internet (e.g. via email, skype, or Echolink) or on the air with Hams. There is no minimum age requirement. The training can be done in small groups or over the internet (e.g. via email, skype, or Echolink) or on the air with Hams. Materials can be downloaded and printed. There are 8 Basic MEWS lessons in PDF slide shows so learners can work at their own pace. Observers would print their own supply of forms or keep notes on plain paper referencing the data block numbers on the standard MEWS form.



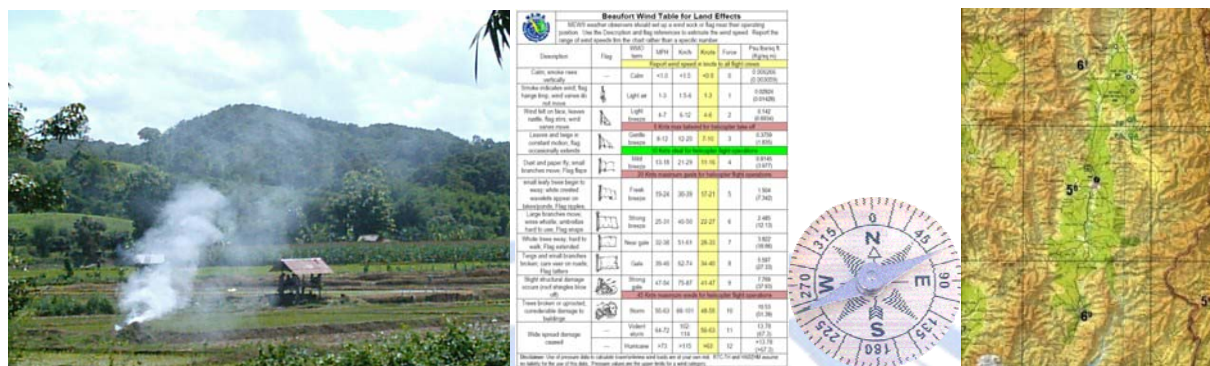
The reference tables are included in the various individual lessons and in the MEWS Weather Observer Handbook. Volunteers are expected to provide all of their own equipment. Practice can be done at home just looking out the window.

Basic MEWS observations are easy enough for school children to do. Home-bound volunteers can also make observations from the comfort of their home. Thus, a wide range of volunteers can be recruited from the community and contribute to providing valuable service in times of an emergency. For school children, the added benefit is the opportunity to apply their classroom lessons in math and science to the real world. This could be a first step to a future job.



Temperature measurements are made with a thermometer in the shade. In an emergency, use an umbrella for shade.

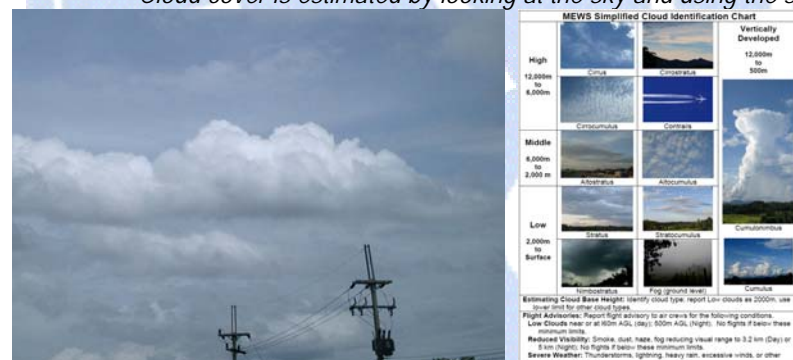
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*Wind speed is estimated by observing the environment, then using a reference chart.
Wind direction is estimated by local knowledge of the basic directions.*

Term	Amount of blue	Amount of cloud	
Clear	Nearly all blue	Little or no clouds	
Scattered clouds	Mostly blue	Some clouds	
Broken clouds	Big blue patches	Mostly clouds	
Cloudy	Some blue	Mostly clouds	
Overcast	Little or no blue	Nearly all clouds	

Cloud cover is estimated by looking at the sky and using the standard terms in a reference chart



Identifying the cloud type gives a general estimate of cloud base height.

The use of simple reference charts helps make subjective observations more consistent. The charts use systematic categories/labels which are common in weather reporting.

Repeated practice in making observations improves observer performance. This makes MEWS training an on going effort.



Estimating visual range is based on local knowledge of land marks and features or from map measurements.



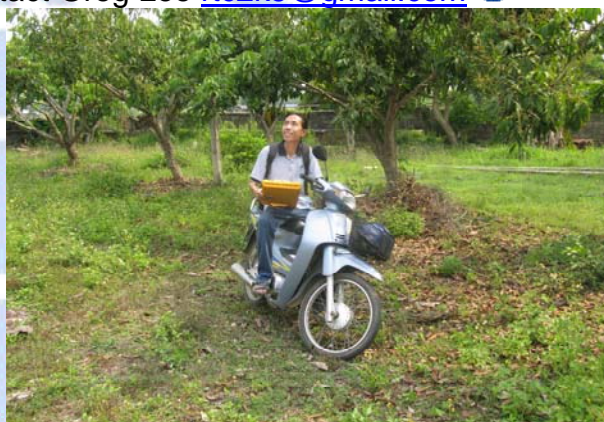
Severe weather observation reports use the "flash-boom" method to estimate storm distance.

The simplicity of the Basic MEWS set up lends itself to rapid deployment by various no tech / low-tech methods and provides a highly robust system capable of functioning in areas of utter devastation. The weakest links in the Basic MEWS equipment are the thermometer and magnetic compass which could be lost or broken. Of the two, the thermometer is the hardest to replace, so a back-up/replacement is a good idea. Local knowledge of the main directions (e.g. North, South, East, and West) is sufficient to Basic MEWS observations and reporting.

To arrange for Basic MEWS training, contact Greg Lee rtc2k5@gmail.com 



Sparky is slow, has limited range, and may encounter obstructed roads and limited fuel/energy supplies.



A motor-bike MEWS observer is faster, can get around some types of obstacles, but limited by fuel availability



A bicycle-MEWS observer is slower than a motor bike but can get to inaccessible areas and has no fuel limits.



A backpack pedestrian-MEWS observer is slower but may be able to get to even more inaccessible locations.




School / shelter-based MEWS observers at a shelter (if students) are familiar with the area and close to family.



Home-based / home-bound MEWS observer at the window can actively contribute in an emergency.

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 Ready to serve and sustain our community.		RTC-TH M.E.W.S. Weather Observation Log									
		Location									
		Lat ° ' " N		Long ° ' " E		Elev m AMSL					
		Lat N		Long E							
Date		Weather Observations Time									
Local time 24-hr format		Hour →		Sunrise		Mid-Afternoon		Sunset			
Observer (initial; see back)											
2. Temperature / Relative Humidity	2.1	Air (Dry bulb)	Thermometer in shade; 1.5 m above ground	°C		°C		°C			
	2.2	Wet Bulb		°C		°C		°C			
	2.3	Difference	Subtract 2.2 from 2.1;	°C		°C		°C			
	2.4	Rel. Humidity	Use 2.1, 2.3; R H Table	%RH		%RH		%RH			
	2.5	Dew Point	Use 2.1, 2.3; Dew Pt Table	°C		°C		°C			
2.6	Heat Stress	Use 2.1, 2.4; HSI Table	Heat Stress °C		Heat Stress °C		Heat Stress °C				
		Danger Level (if any from Heat Stress Index table)	<input type="checkbox"/> Cautn <input type="checkbox"/> Danger <input type="checkbox"/> Ex Cautn <input type="checkbox"/> Ex Danger	<input type="checkbox"/> Cautn <input type="checkbox"/> Danger <input type="checkbox"/> Ex Cautn <input type="checkbox"/> Ex Danger	<input type="checkbox"/> Cautn <input type="checkbox"/> Danger <input type="checkbox"/> Ex Cautn <input type="checkbox"/> Ex Danger						
2.7	Wind Chill	Use 2.1, 3.1; Wind Chl Tbl	Wind Chill. °C		Wind Chill. °C		Wind Chill. °C				
		Danger Level (if any from Wind Chill chart)	<input type="checkbox"/> Trvl Dngr <input type="checkbox"/> Frstbite10 <input type="checkbox"/> TShltr Dgr <input type="checkbox"/> Frstbite30 <input type="checkbox"/> Frstbite <input type="checkbox"/> Frstbite5	<input type="checkbox"/> Trvl Dngr <input type="checkbox"/> Frstbite10 <input type="checkbox"/> TShltr Dgr <input type="checkbox"/> Frstbite30 <input type="checkbox"/> Frstbite <input type="checkbox"/> Frstbite5	<input type="checkbox"/> Trvl Dngr <input type="checkbox"/> Frstbite10 <input type="checkbox"/> TShltr Dgr <input type="checkbox"/> Frstbite30 <input type="checkbox"/> Frstbite <input type="checkbox"/> Frstbite5						
3. Wind Speed / Direction	Report wind speed in knots to air crews ; km/h to all others.										
	Average	Get 3 readings & average	km/h knts		km/h knts		km/h knts				
	Gusts	Record highest gust	km/h knts		km/h knts		km/h knts				
	Wind Speed Guidelines for Helicopter Flight Operations 10 knots / 18.5 km/h ideal; OK to fly Above 45 knots / 83 km/h; No flights. Gusts above 20 knots/ 37 km/h; No flights Max tailwind 5 knots/ 6 km/hr; No take off										
	3.2	Steady Wind Direction	Circle direction steady wind comes FROM	N NE S SW E SE W NW	N NE S SW E SE W NW	N NE S SW E SE W NW	N NE S SW E SE W NW				
4. Sky Conditions	4.1	Cloud Cover	Use Definitions in Cloud Cover Table	<input type="checkbox"/> Clear <input type="checkbox"/> Cloudy <input type="checkbox"/> Scattered <input type="checkbox"/> Overcast <input type="checkbox"/> Broken	<input type="checkbox"/> Clear <input type="checkbox"/> Cloudy <input type="checkbox"/> Scattered <input type="checkbox"/> Overcast <input type="checkbox"/> Broken	<input type="checkbox"/> Clear <input type="checkbox"/> Cloudy <input type="checkbox"/> Scattered <input type="checkbox"/> Overcast <input type="checkbox"/> Broken					
	4.2	Cloud Base Ht (Loc Rel)	Relative to local Mtn	<input type="checkbox"/> Clouds above mtn <input type="checkbox"/> Clouds at mtn top <input type="checkbox"/> Clouds below mtn	<input type="checkbox"/> Clouds above mtn <input type="checkbox"/> Clouds at mtn top <input type="checkbox"/> Clouds below mtn	<input type="checkbox"/> Clouds above mtn <input type="checkbox"/> Clouds at mtn top <input type="checkbox"/> Clouds below mtn					
			m AMSL	m AMSL	m AMSL	m AMSL					
	Min. flight altitudes: Day - 160m AGL; Night - 500 m AGL; Low cloud ceiling - No flights.										
	4.3	Cloud Type	High	<input type="checkbox"/> Cirrus <input type="checkbox"/> CuNim <input type="checkbox"/> Altostrat <input type="checkbox"/> Altostrat <input type="checkbox"/> Altocum <input type="checkbox"/> Altocum	<input type="checkbox"/> Cirrus <input type="checkbox"/> CuNim <input type="checkbox"/> Altostrat <input type="checkbox"/> Altostrat <input type="checkbox"/> Altocum <input type="checkbox"/> Altocum	<input type="checkbox"/> Cirrus <input type="checkbox"/> CuNim <input type="checkbox"/> Altostrat <input type="checkbox"/> Altostrat <input type="checkbox"/> Altocum <input type="checkbox"/> Altocum					
4.4	Rainfall	Middle	<input type="checkbox"/> Stratus <input type="checkbox"/> Cumul <input type="checkbox"/> Nimstrat <input type="checkbox"/> Nimstrat	<input type="checkbox"/> Stratus <input type="checkbox"/> Cumul <input type="checkbox"/> Nimstrat <input type="checkbox"/> Nimstrat	<input type="checkbox"/> Stratus <input type="checkbox"/> Cumul <input type="checkbox"/> Nimstrat <input type="checkbox"/> Nimstrat						
		Low									
4.5	Visual Range (Visibility)	Name of 3.2 km mark	<input type="checkbox"/> more <input type="checkbox"/> less than <input type="checkbox"/> Rain <input type="checkbox"/> Fog <input type="checkbox"/> Haze <input type="checkbox"/> Smoke	<input type="checkbox"/> more <input type="checkbox"/> less than <input type="checkbox"/> Rain <input type="checkbox"/> Fog <input type="checkbox"/> Haze <input type="checkbox"/> Smoke	<input type="checkbox"/> more <input type="checkbox"/> less than <input type="checkbox"/> Rain <input type="checkbox"/> Fog <input type="checkbox"/> Haze <input type="checkbox"/> Smoke						
		Name of 3.2 km mark	<input type="checkbox"/> more <input type="checkbox"/> less than <input type="checkbox"/> Rain <input type="checkbox"/> Fog <input type="checkbox"/> Haze <input type="checkbox"/> Smoke	<input type="checkbox"/> more <input type="checkbox"/> less than <input type="checkbox"/> Rain <input type="checkbox"/> Fog <input type="checkbox"/> Haze <input type="checkbox"/> Smoke	<input type="checkbox"/> more <input type="checkbox"/> less than <input type="checkbox"/> Rain <input type="checkbox"/> Fog <input type="checkbox"/> Haze <input type="checkbox"/> Smoke						
Helicopter minimum visibility: Day - 3.2 km / 2 miles; Night - 5 km / 3 miles; Low visibility - No flights											
4.6	Severe Weather	Thunderstorms	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No						
		Lightning	Flash, count secs to boom / 3	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No					
Warn air crews of any severe weather in your area.											

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









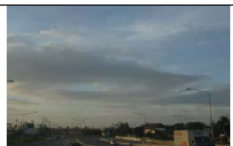






<div>  RTC-TH MEWS modified Beaufort Wind Table for Land Effects MEWS weather observers should set up a wind sock or flag near their operating position. Use the Description and flag references to estimate the wind speed. Report the range of wind speeds from the chart rather than a specific number. </div>							
Description	Flag	WMO term	MPH	Km/h	Knots	Force	Psu lbs/sq ft (Kg/sq m)
Report wind speed in knots to all flight crews							
Calm; smoke rises vertically	---	Calm	<1.0	<1.5	<0.9	0	0.006266 (0.003059)
Smoke indicates wind; flag hangs limp, wind vanes do not move		Light air	1-3	1.5-6	1-3	1	0.02924 (0.01428)
Wind felt on face, leaves rustle, flag stirs, wind vanes move		Light breeze	4-7	6-12	4-6	2	0.142 (0.6934)
5 Knts max tailwind for helicopter take off							
Leaves and twigs in constant motion; flag occasionally extends		Gentle breeze	8-12	12-20	7-10	3	0.3759 (1.835)
10 Knts ideal for helicopter flight operations							
Dust and paper fly; small branches move; Flag flaps		Mild breeze	13-18	21-29	11-16	4	0.8145 (3.977)
20 Knts maximum gusts for helicopter flight operations							
small leafy trees begin to sway; white crested wavelets appear on lakes/ponds; Flag ripples,		Fresh breeze	19-24	30-39	17-21	5	1.504 (7.342)
Large branches move; wires whistle; umbrellas hard to use; Flag snaps		Strong breeze	25-31	40-50	22-27	6	2.485 (12.13)
Whole trees sway; hard to walk; Flag extended		Near gale	32-38	51-61	28-33	7	3.822 (18.66)
Twigs and small branches broken; cars veer on roads; Flag tatters		Gale	39-46	62-74	34-40	8	5.597 (27.33)
Slight structural damage occurs (roof shingles blow off)		Strong gale	47-54	75-87	41-47	9	7.769 (37.93)
45 Knts maximum winds for helicopter flight operations							
Trees broken or uprooted, considerable damage to buildings		Storm	55-63	88-101	48-55	10	10.53 (51.39)
Wide spread damage caused	---	Violent storm	64-72	102-114	56-63	11	13.78 (67.3)
	---	Hurricane	>73	>115	>63	12	>13.78 (>67.3)
Disclaimer: Wind pressure values are the upper limits for a wind category. Use of the wind pressure data to calculate tower/antenna wind loads are at your own risk. RTC-TH and HSØZHM assume no liability for the use of this data.							

Table of Cloud Cover Terms				Flash / Boom Storm Distance Estimation	
Term	Amount of blue	Amount of cloud		<p>Use this method to estimate the distance to a thunderstorm.</p> <ul style="list-style-type: none">Immediately upon seeing a flash of lightning, count the number of seconds until you hear the boom of the thunder.Divide the number of seconds by 3 = km estimated distance to the storm <p>When the flash and boom are almost instantaneous, you may be in big trouble.</p> <p>People have been struck by lightning 56+ km away from a thunderstorm.</p>	
Clear	Nearly all blue	Little or no clouds			
Scattered clouds	Mostly blue	Some clouds			
Broken clouds	Big blue patches	Mostly clouds			
Cloudy	Some blue	Mostly clouds			
Overcast	Little or no blue	Nearly all clouds			
MEWS Simplified Cloud Identification Chart					
High 12,000m to 6,000m			Vertically Developed 12,000m to 500m		
	Cirrus	Cirrostratus			
Middle 6,000m to 2,000 m					
	Cirrocumulus	Contrails			
Low 2,000m to Surface					
	Altostratus	Altostratus			
					
	Stratus	Stratocumulus			
					
	Nimbostratus	Fog (ground level)			
Estimating Cloud Base Height: Identify cloud type; report Low clouds as 2000m, use lower limit for other cloud types.					
Flight Advisories: Report flight advisory to air crews for the following conditions.					
Low Clouds near or at 160m AGL (day); 500m AGL (Night). No flights if below these minimum limits.					
Reduced Visibility: Smoke, dust, haze, fog reducing visual range to 3.2 km (Day) or 5 km (Night); No flights if below these minimum limits.					
Severe Weather: Thunderstorms, lightning, heavy rain, excessive winds, or other weather extremes.					