Rural Training Center – Thailand (RTC-TH)

FOCUS

Community-based Environmental Education for the Self-sufficiency and Sustainability of Small Rural Family Farms

MEWS Weather Observer Orientation

Photos from internet: fair educational use clause

A Mobile Emergency Weather Station (MEWS) Training Series presentation

Rural Training Center-Thailand
Emergency Communications Program

Ready to serve and sustain our community

For other lessons in the series e-mail hsØzhm@gmail.com
www.neighborhoodlink.com/org/rtcth

A part of the RTC-TH EmComm Program

The Rural Training Center-Thailand Emergency Communications program is a volunteer effort to provide emergency amateur radio communications for local community self-sufficiency and sustainability in times of need.

E-mail: hsØzhm@gmail.com

The Rural Training Center-Thailand (RTC-TH)

is an all volunteer organization providing community-based environmental education for self-sufficiency and sustainability of small rural family farms

www.neighborhoodlink.com/org/rtcth

E-mail: rtc2k5@gmail.com

The Rural Training Center-Thailand was created to honor the life and memory of Mr. Tang Suttisan, a father, farmer and former custodian of Ban Na Fa Elementary School who appreciated and valued education.

MEWS
(Mobile Emergency Weather Station)

MEWS is an integral part of the RTC-TH EmComm (Emergency Communications Program) which is "Ready to Serve and Sustain Our Community."

Photos from the Internet; educational fair use clause

What is a MEWS Observer?

A MEWS observer is someone able to record and report weather data for their locale to help their community in times of emergencies ***especially*** when normal weather data reports are not available locally.

Why be a MEWS Observer?

You can make a difference

Photo from internet: fair educational use clause

Many disaster survivors feel helpless and powerless.
MEWS empowers you to act and help the recovery.

Many relief workers come from outside the local area.

They may not be familiar with the local roads, towns, and villages.

Photos from internet: fair educational use clause

You can make a difference!

Helicopters and aircraft are commonly used in disaster response

Photos from the Internet; educational fair use clause

This is what can happen when pilots don't have weather reports

You can make a difference by being a MEWS Observer.

Photos from the Internet; educational fair use clause

Your weather observations and reports can increase flight safety during emergencies.

Who can be a MEWS Observer?

Anyone who is willing to learn and to serve their community in time of need.

The young and the “very experienced youth” who are home bound can look out the window and make weather observations.

Who can be a MEWS Observer?

Photo courtesy of Mark, N7YLA

Photo from the Internet; educational fair use clause

The ideal person would be a licensed amateur radio operator. They can radio their weather reports to relief authorities.

Who can be a licensed amateur?

Photos from the Internet; educational fair use clause

Just about anyone can take the exam and get an amateur radio license; boys, girls, men, women of all walks of life.

Where do MEWS Observers go?

Although volunteers can travel throughout the Kingdom, most people operate locally in times of emergency. They serve their communities.

Photo courtesy of Al, E20NXT

How do they do they get there?

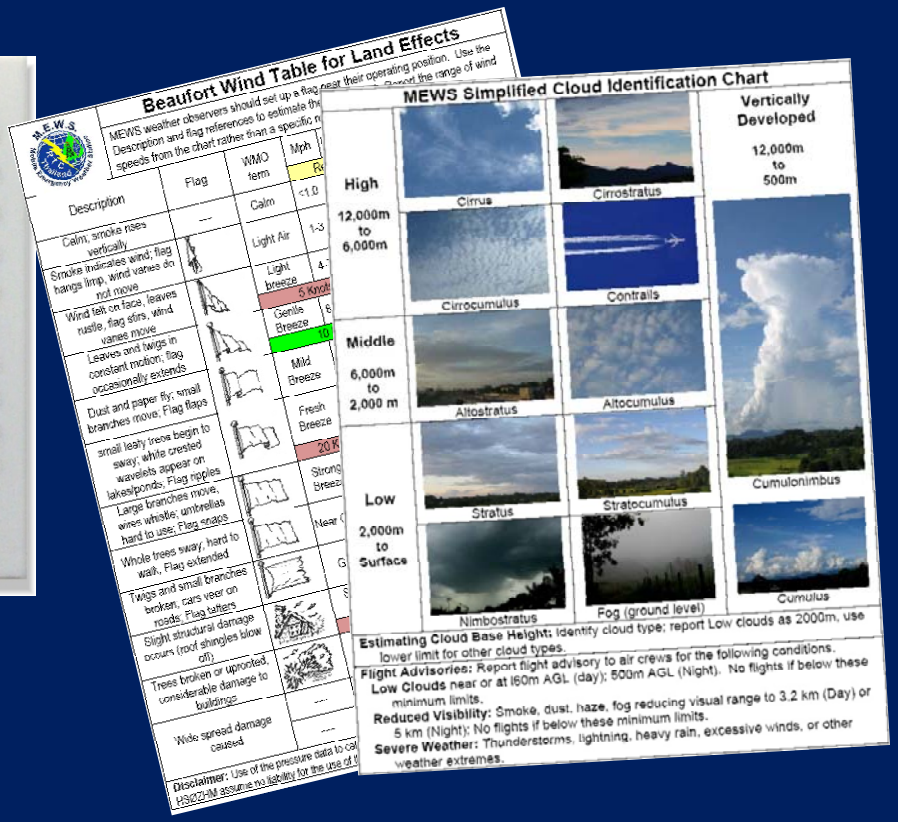
It depends on the volunteer, available transportation, distance and obstacles to the operating site. Most of the time they operate close to home.

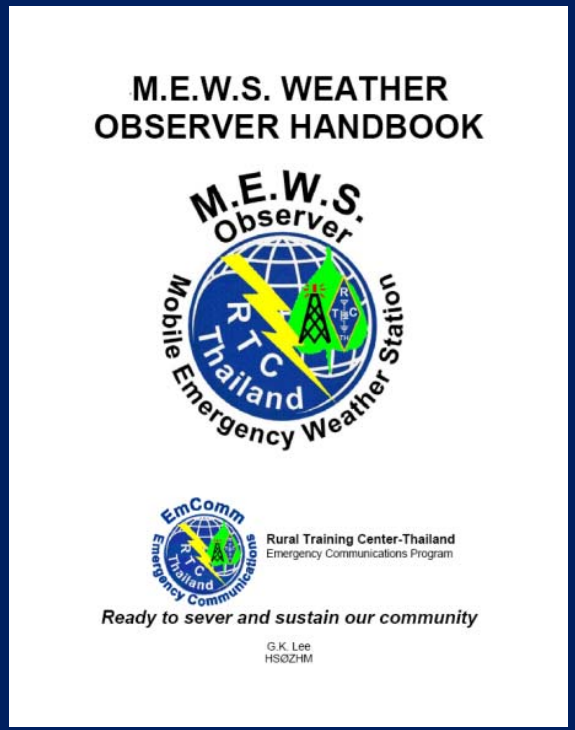
M.E.W.S. Mobile Emergency Weather Station RTC Thailand

EmComm Emergency Communications RTC Thailand

Where do they get equipment?

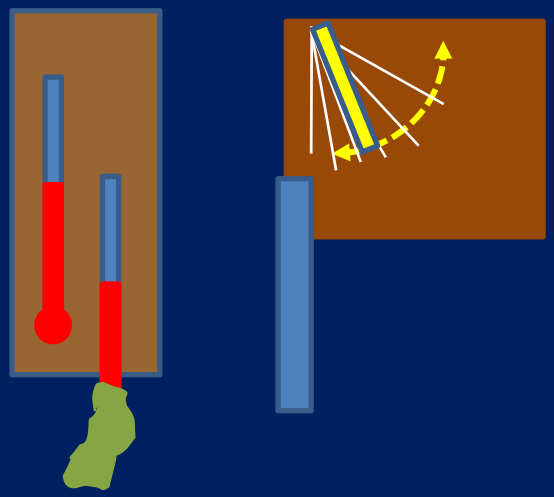
Basic level MEWS can be done with reference tables from the free MEWS Observer Handbook and a thermometer.





Where do they get equipment?

Some Advanced level MEWS equipment can be homemade. Or, like Ham radio equipment, you can spend to buy more.



Fro m left to right: Hygrometer, wind speed meter, rain gauge, and wind direction finder.

How do they do their work?

MEWS volunteers can use weather observations to help manage their farms. If they do this, they get practice making weather observations.

In an emergency, they do the same basic weather observations but emphasize reporting it to authorities.

Photos from internet: fair educational use clause

Why have MEWS?

In most disasters, there is no local weather data from the disaster site. Weather affects all aspects of emergency relief efforts:

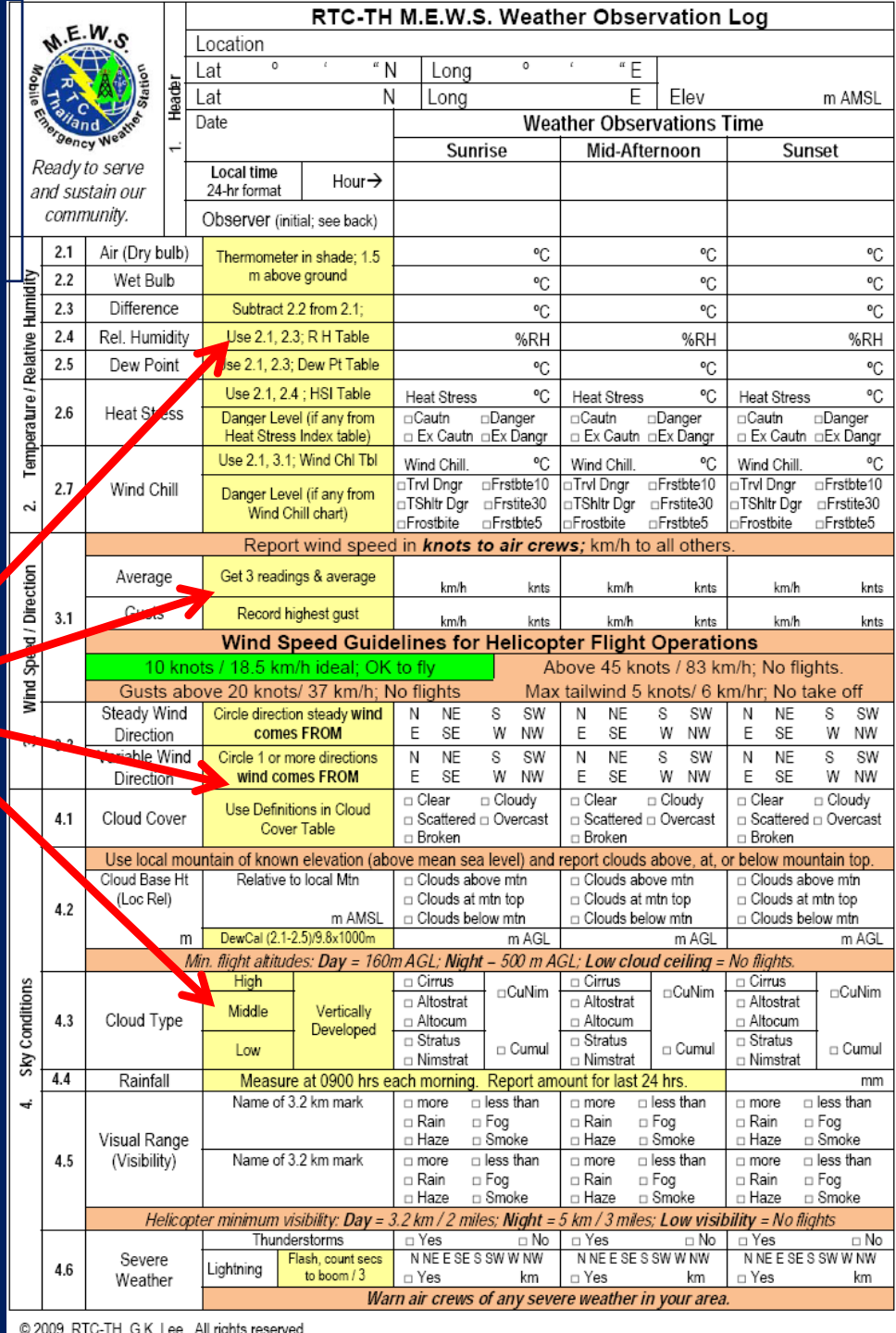
Logistics: the movement of evacuees and rescue workers

- Survivor needs: Heat, cold, wind, and rain all affect the water, food, clothing and shelter survivors need.
- Flight operations: Helicopters are commonly used to speed relief supplies and workers to a disaster site. Weather data from the site helps keep flight operations safe.

How Can I Get Trained?

The MEWS Log Form is set up for self-learning. It has brief notes about what is to be done and how.

Detailed instructions are in the MEWS manual



RTC-TH M.E.W.S. Weather Observation Log

Ready to serve and sustain our community.

1. Header

Location

Lat ° ' " N Long ° ' " E

Lat N Long E Elev m AMSL

Date

Local time 24-hr format Hour→

Observer (initial; see back)

			Weather Observations Time: Sunrise	Mid-Afternoon	Sunset
			Local time 24-hr format: Hour→		
			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)	□Cautn □Danger □ Ex Cautn □Ex Dangr	□Cautn □Danger □ Ex Cautn □Ex Dangr	□Cautn □Danger □ Ex Cautn □Ex Dangr
	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)	□Trvl Dngr □Frstbte10 □TShltr Dgr □Frstite30 □Frostbite □Frstbte5	□Trvl Dngr □Frstbte10 □TShltr Dgr □Frstite30 □Frostbite □Frstbte5	□Trvl Dngr □Frstbte10 □TShltr Dgr □Frstite30 □Frostbite □Frstbte5
3. Wind Speed / Direction			Report wind speed in ***knots to air crews;*** km/h to all others.			
	3.1	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
	3.3	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	□ Clear □ Cloudy □ Scattered □ Overcast □ Broken	□ Clear □ Cloudy □ Scattered □ Overcast □ Broken	□ Clear □ Cloudy □ Scattered □ Overcast □ Broken
			Use local mountain of known elevation (above mean sea level) and report clouds above, at, or below mountain top.			
	4.2	Cloud Base Ht (Loc Rel)	Relative to local Mtn m AMSL	□ Clouds above mtn □ Clouds at mtn top □ Clouds below mtn	□ Clouds above mtn □ Clouds at mtn top □ Clouds below mtn	□ Clouds above mtn □ Clouds at mtn top □ Clouds below mtn
		m	DewCal (2.1-2.5)/9.8x1000m	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 / Middle / Low; Vertically Developed	□ Cirrus □ Altostrat □ Altocum □ Stratus □ Nimstrat; □CuNim □ Cumul	□ Cirrus □ Altostrat □ Altocum □ Stratus □ Nimstrat; □CuNim □ Cumul	□ Cirrus □ Altostrat □ Altocum □ Stratus □ Nimstrat; □CuNim □ Cumul
	4.4	Rainfall	Measure at 0900 hrs each morning. Report amount for last 24 hrs.			mm
	4.5	Visual Range (Visibility)	Name of 3.2 km mark	□ more □ less than □ Rain □ Fog □ Haze □ Smoke	□ more □ less than □ Rain □ Fog □ Haze □ Smoke	□ more □ less than □ Rain □ Fog □ Haze □ Smoke
			Name of 3.2 km mark	□ more □ less than □ Rain □ Fog □ Haze □ Smoke	□ more □ less than □ Rain □ Fog □ Haze □ Smoke	□ more □ less than □ Rain □ Fog □ Haze □ Smoke
			Helicopter minimum visibility: ***Day*** *= 3.2 km / 2 miles;* ***Night*** *= 5 km / 3 miles;* ***Low visibility*** *= No flights*			
	4.6	Severe Weather	Thunderstorms	□ Yes □ No	□ Yes □ No	□ Yes □ No
			Lightning; Flash, count secs to boom / 3	N NE E SE S SW W NW □ Yes km	N NE E SE S SW W NW □ Yes km	N NE E SE S SW W NW □ Yes km
			Warn air crews of any severe weather in your area.			

The Back of the Form has more notes to help guide you

If more information is needed, its available in the MEWS Handbook

M.E.W.S. WEATHER OBSERVER HANDBOOK

M.E.W.S. Observer – Mobile Emergency Weather Station – RTC Thailand

EmComm Emergency Communications – RTC Thailand

Rural Training Center-Thailand
Emergency Communications Program

Ready to sever and sustain our community

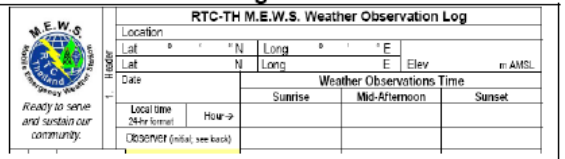
G.K. Lee
HSØZHM

All weather observers write their initials and clearly print their name using block letters			

M.E.W.S. Summary Weather Observation Log Instructions

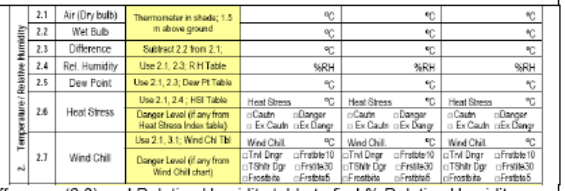
Header

Location: Local Place Name
Latitude, Longitude from GPS, survey records or map measurement.
Elevation: Survey records or map measurement (GPS elevations are not reliable).
Date/Hour: Use local Thai standard time in 24-hour format.
Observer: initials in box. Full name (print clearly) on top/back of form



Temperature / Relative Humidity

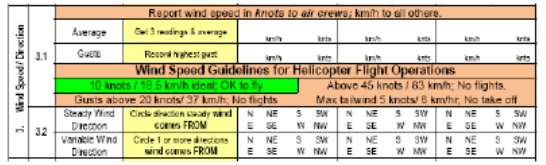
2.1 Air (Dry Bulb) Temp: Read thermometer kept in the shade, 1.5 m above the ground.
2.2 Wet Bulb Temp from hyrgrometer kept in the shade, 1.5 m above the ground.
2.3 Difference between Dry and Wet Bulb temperatures.



2.4 Relative Humidity: Use Dry Bulb Temp (2.1), Difference (2.3) and Relative Humidity table to find % Relative Humidity.
2.5 Dew Point Temperature: Use Dry Bulb Temp (2.1), Difference (2.3) and Dew Point Temp table to find Dew Point Temp.
2.6 Heat Stress Temperature: Use Dry Bulb Temp (2.1), % Relative Humidity (2.4) and Heat Stress Index Table to find Heat Stress Temperature and relevant advisory warning.
2.7 Wind Chill: Use the Dry Bulb Temp (2.1) and Wind Speed (3.1) and Wind Chill Table to find the Wind Chill Temperature and relevant advisory warning.

Wind Speed / Direction

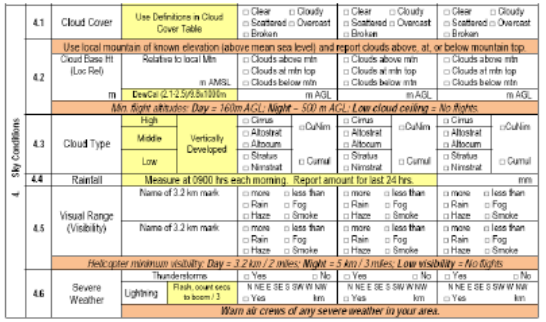
3.1 Average and Gust Wind speeds: Use Beaufort Table or direct measurements 3 times and average results. Gusts are short, strong blasts of wind. *Report wind speeds in knots to air crews. Advise air crews when wind speeds are close to affecting helicopter flight operations.*



3.2 Steady or Variably blowing winds. If steady, circle letter for direction. If variable, circle all appropriate letters for directions.

Sky Conditions

4.1 Cloud cover: Look at the sky and follow the definitions for each cloud cover classification.
4.2 Cloud Base Height: If relative to a local mountain, give its name and elevation above mean sea level. Note Local Relief in meters. If using the Dew Point method, subtract Dew point temp (2.5) from Dry temp (2.1) and divide result by 9.8; multiply quotient by 1000m. *Advise air crews when cloud base height (ceiling) are close to affecting helicopter flight operations.*
4.3 Cloud Type: Check the appropriate box based on cloud description in the guide book



4.4 Rainfall: Measure water in rain gauge each day at 0900 hrs. Rain gauge should be in open area, away from tall objects, with top of gauge 50 cm above ground to avoid splash water from entering gauge.
4.5 Visual Range: Pick landmarks 3.2 km and 5 km from your observation site. Report when visual range is more or less than the known distances to these landmarks. *Advise air crews when visual range is close to affecting helicopter flight operations.* Check appropriate boxes for reasons of reduced visibility.
4.6 Severe Weather: Primary concerns and thunderstorms and lightning. Check the appropriate boxes. If lighting, watch for flash, count seconds until you hear the thunder, divide by 3 = approximate distance in km. Circle direction to storm.

How Can I Get Trained?

Distance learning can be done for Individuals or small groups

Via E-mail / video chat
hsØzhm@gmail.com

Via Skype video conference call: rtc_th

Contact us on EchoLink node 520300

Post questions in the Discussion page of our website

www.neighborhoodlink.com/org/rtcth

How can I get trained?

The training is free and can be done in a 1-day workshop. If not at an RTC-TH site, we ask the group for room / board and transportation to your site. “Teach backs” enable you to train others after we leave. But you can still use the internet for more mentoring.

Where can I get the materials?

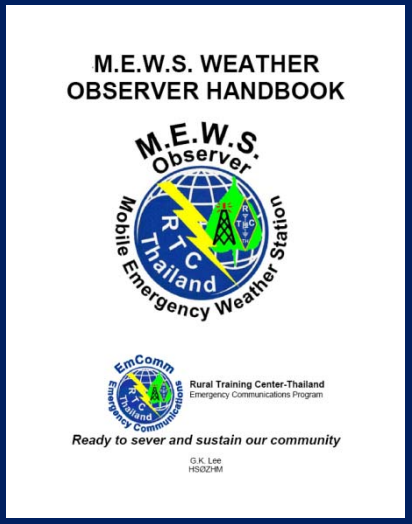
Send e-mail to Greg, hsØzhm@gmail.com to request free training materials for non-commercial use only.

The free access to MEWS training materials is in the spirit of amateur radio operators serving their communities for the common good.

Free Self-Study Materials by Internet

- RTC-TH Weather Observer handbook
- Illustrated PDF topical lessons

All of the lessons have been classroom and field proven.

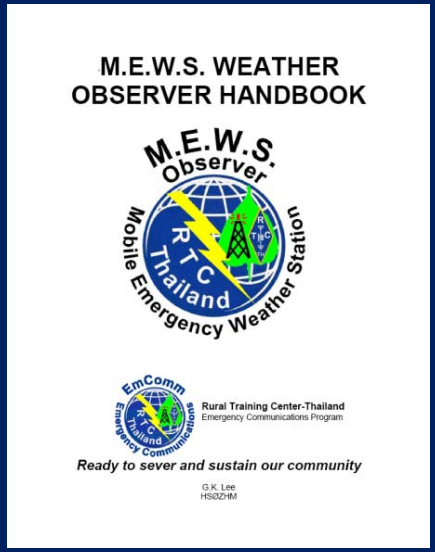


Send e-mail to hsØzhm@gmail.com to request free training materials for non-commercial use only.

These materials are in English. Volunteer assistance for Thai translation to is welcome and will be acknowledged and cited.

Questions or Comments

Refer to the MEWS Weather Observer Handbook for more details on any of the procedures in the lessons.

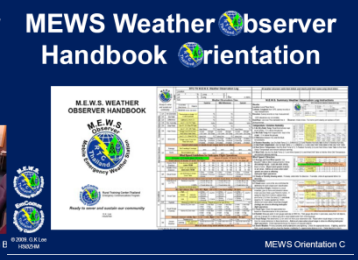


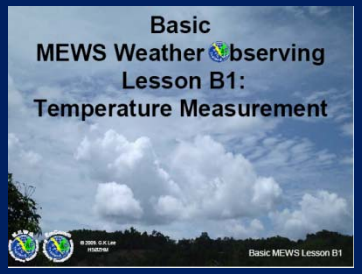
You may also contact us by e-mail:
hsØzhm@gmail.com
We are always trying to improve our lessons. Your comments and suggestions are welcomed.

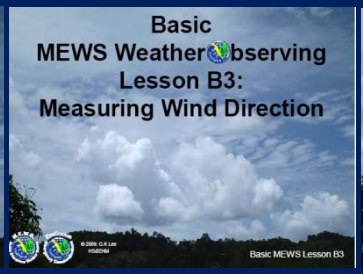
Basic MEWS PDF Lessons

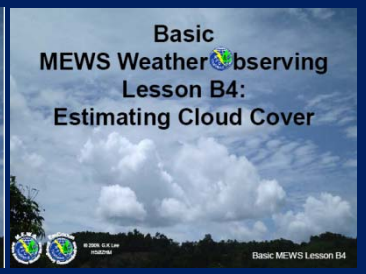
B 1: Measuring Temperature
B 2: Estimating wind speed
B 3: Measuring Wind Direction
B 4: Estimating Cloud Cover
B 5: Estimating Cloud Base Height
B 6: Identifying Cloud Types
B 7: Estimating Visual Range
B 8: Severe Weather Conditions

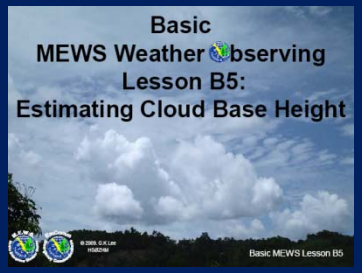
Basic MEWS PDF Lessons

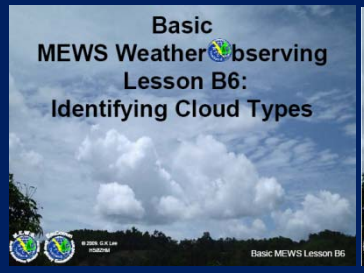


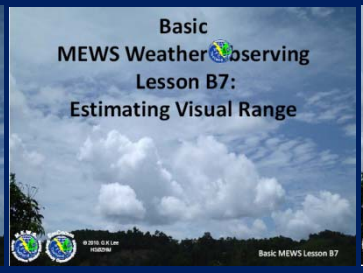


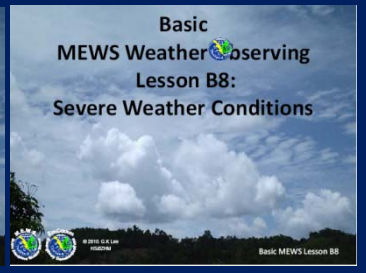












3 Orientation and 8 Basic lessons.
Some show how to build your own weather equipment.

Advanced MEWS PDF Lessons

A 1: Measuring Relative Humidity and Heat Stress
A 2: Measuring Wind Speed and Wind Chill
A 3: Using Dew Point Temperature to Calculate Cloud Base Height
A 4: Measuring Rainfall
A 5: Reporting Severe Weather
A 6: Weather Forecasting

Advanced MEWS PDF Lessons

Six slide show lessons

Some show how to build your own weather equipment

For More Information about M.E.W.S.

Contact
Greg HSØZHM
MEWS Creator / Mentor

Via E-mail / video chat
hsØzhm@gmail.com

Via Skype video
conference call: rtc_th

Future RTC-TH EmComm Lessons

- Identifying local Geo-Hazards
- Finding safe EmComm operating sites
- Identifying main supply routes and alternate routes
- Finding Helicopter Landing Zones
- Helicopter landing zone hand signals
- Ground to air communication without radios

Community-based Environmental Education for

The End

Continue to the Addendum after this slide to “Meet the MEWS Teacher”

MEWS creator/author/mentor

Relatively new to amateur radio with a long history of commitment to community service and practical education.

Greg Lee

- Co-Founder of the Rural Training Center-Thailand
- Retired Professor Emeritus, Geography
- 12 years experience in geo-technical & environmental consulting engineering
- 29 years teaching experience in the 8 different countries (at secondary, adult, and college / university levels)
- License amateur radio operator KI6GIG / HSØZHM

Community-based Environmental Education for

The End