Atmospheric Conditions

Presentation Outline

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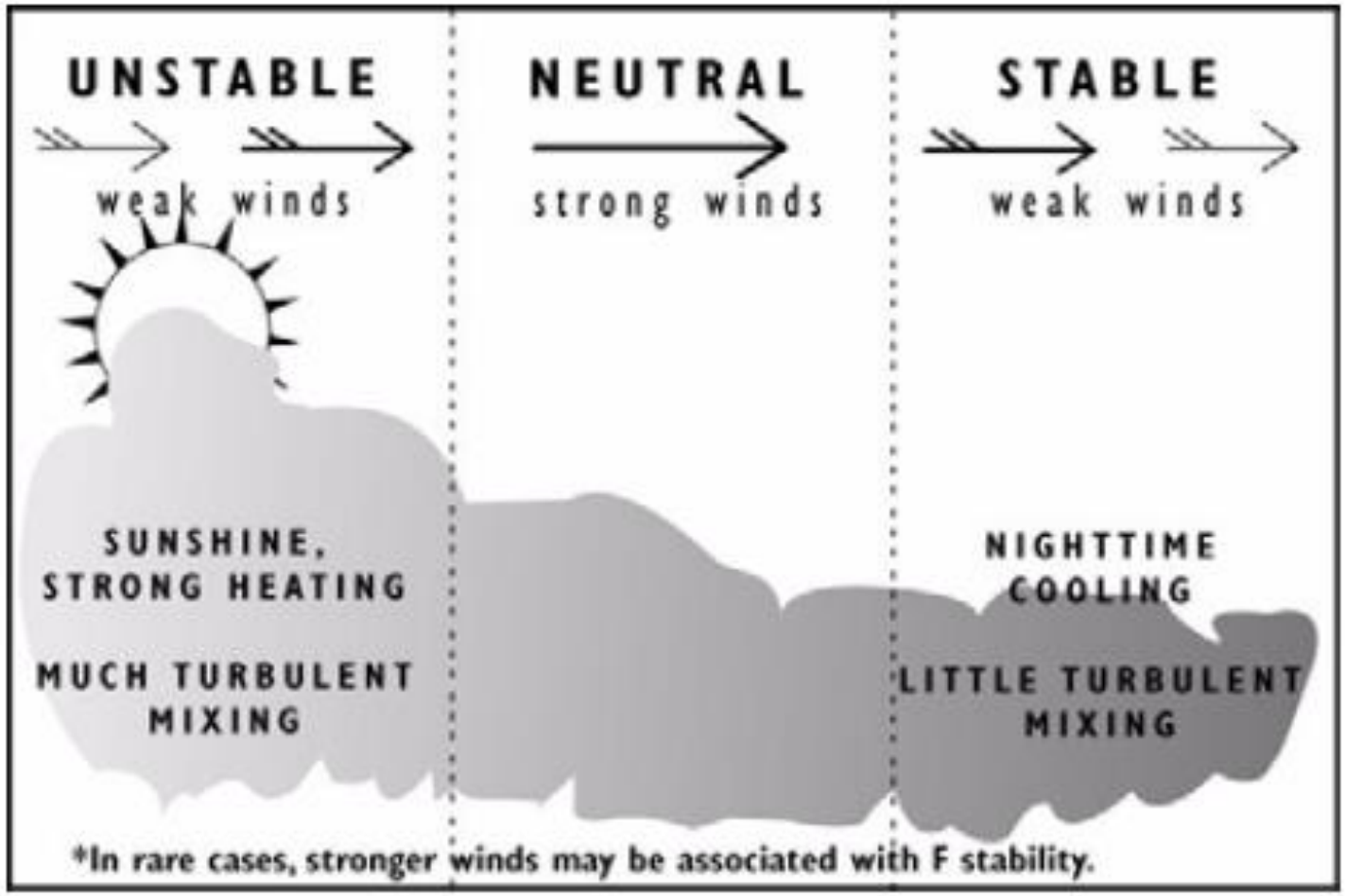
Wind Characteristics

Meters per Second	Knots	International Description	Specifications
<1	<1	Calm	Calm; smoke rises vertically
<1-2	1-3	Light air	Direction of wind shown by smoke drift, but not by wind vanes
2-3	4-6	Light breeze	Wind felt on face; leaves rustle; ordinary vane moved by wind
4-5	7-10	Gentle breeze	Leaves and small twigs in constant motion; wind extends light flag
5-8	11-16	Moderate	Raises dust, loose paper; small branches are moved
8-11	17-21	Fresh	Small trees in leaf begin to sway; crested wavelets form on inland water
11-14	22-27	Strong	Large branches in motion; whistling heard in telegraph wires; umbrellas used with difficulty
14-17	28-33	Near gale	Whole trees in motion; inconvenience felt walking against wind
17-21	34-40	Gale	Breaks twigs off trees; generally impedes progress

Pasquill Atmospheric

- The Pasquill atmospheric stability classes
- A – very unstable
- B – unstable
- C – slightly unstable
- D – neutral
- E – slightly stable
- F – stable

Stability Classes and Mixing of Pollutants



Stability Class and Wind Speed

Wind Speed*			Day: Incoming Solar Radiation			Night: Cloud Cover	
Meters per second	Knots	Miles per hour	Strong**	Moderate	Slight***	>50%	<50%
<2	<3.9	<4.5	A	A-B	B	E	F
2-3	3.9-5.8	4.5-6.7	A-B	B	C	E	F
3-5	5.8-9.7	6.7-11.2	B	B-C	C	D	E
5-6	9.7-11.7	11.2-13.4	C	C-D	D	D	D
>6	>11.7	>13.4	C	D	D	D	D
Note: Stability is D for completely overcast conditions during day or night.							
Note: This table is for releases over land. If the release occurs over water, the stability class will be either D or E.							
* Wind reference height is 10 meters.							
** "Strong" solar radiation corresponds to clear skies with the sun high in the sky (solar angle greater than 60 degrees).							
+ "Slight" solar radiation corresponds to clear skies with the sun low in the sky (solar angle between 15 and 35 degrees).							

Inversion

- An inversion is an atmospheric condition in which an unstable layer of air near the ground lies beneath a very stable layer of air above
- The height of the abrupt change of atmospheric stability is called the inversion height
- An inversion can trap pollutant gases below the inversion height, causing ground-level concentrations of a pollutant to reach higher levels than would otherwise be expected.

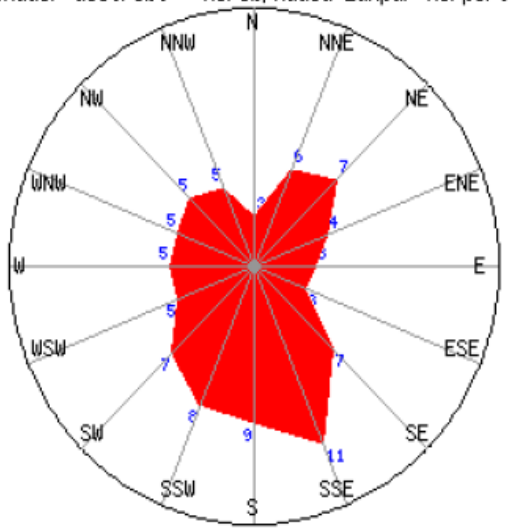
Windrose

Morib/Kuala Lumpur Airport (MORIB)

Statistics based on observations taken between 1/2008 - 6/2010 daily from 7am to 7pm local time.

Month of year	Jan 01	Feb 02	Mar 03	Apr 04	May 05	Jun 06	Jul 07	Aug 08	Sep 09	Oct 10	Nov 11	Dec 12	SUM 1-12
Dominant Wind dir.													
Wind probability > = 4 Beaufort (%)	5	1	2	1	1	1	1	0	0	0	1	1	**1**
Average Wind speed (Knots)	5	5	4	4	4	4	5	5	4	4	3	4	**4**
Average air temp. (°C)	29	30	29	29	30	29	29	29	29	29	28	28	**29**
Select month (Help)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year

Winddir distrib. Morib/Kuala Lumpur Airport



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Wind direction Distribution (%)

Thank You