KILROY ACADEMY

KILROY TERMINOLOGY

- **BACKGROUND:** Kilroy is a water-quality system unlike any other. Kilroy systems monitor the physical, chemical and biological indicators of health in a particular body of water and it does so, 24 hours a day, 365 days a year. A fully-loaded Kilroy system measures environmental parameters 1 through 16 listed below. Kilroys equipped with a meteorological station measure the remaining five terms.
- **PURPOSE:** This activity is designed to introduce the scientific terms Kilroy uses to convey the current conditions of the Indian River Lagoon. Researching this terminology will allow the public to familiarize themselves prior to a Kilroy investigation, thereby producing accurate and informed conclusions.
- **DIRECTIONS:** For each term below, you are to research and record –
    - The definition or description (What does it mean or what does it measure?)
    - The units (What units do you use to measure it? How do you measure it?)
    - The normal range (What do the readings mean? What is a normal reading?)

KILROY TERMINOLOGY	DEFINITION	UNITS	NORMAL RANGE
1. Depth	The measure of distance from the air/water interface (the surface) to the water/substrate interface (the bottom).	Meter Feet Fathom = 6 feet (nautical)	N/A

2. Temperature	The degree or intensity of heat present in the air; measured as degrees on a standard scale, such as Fahrenheit or Celsius (Centigrade).	Degrees (º) Centigrade Degrees (º) Fahrenheit	ºC = ºF – 32/1.800 0ºC (freezing in freshwater) 37.7ºC = 100ºF
3. Salinity	The saltiness or dissolved salt content of a body of water.	Grams/kilogram (g/kg), *parts per thousand* (ppt), ‰ (symbol), or PSU (Practical Salinity Units)	Freshwater < 0.5 ‰ Brackish – 0.5 – 30 ‰ Saline - 30 – 50 ‰ Brine > 50 ‰ Ocean water average = 34.7 ‰
4. Conductivity	The measure of an electrolyte solution's ability to conduct electricity.	The electricity conducted through a cm of water (mhos/cm) also called Seimens or S/cm	100 mS/m (freshwater) – 5S/m (ocean water)
5. Water Temperature	The degree or intensity of heat present in water; measured as degrees on a standard scale, such as Fahrenheit or Celsius (Centigrade).	ºC. (centigrade) or ºF. (Fahrenheit) Conversion factor: (ºC. x 1.8 +32 = ºF.)	5 - 32ºC. 41 – 89.6 ºF.
6. Flow speed	Determines how rapidly organisms and substances are transported.	Meters/second (m/s) Kilometers/hr (k/hr) Miles/hour, Knots/hour (1 knot = 1.151 miles)	1km/hr = .277 m/s = 27.7 cm/s
7. Flow direction	The direction water is flowing.	Flow direction measured in degrees where 0° (or 360°) is N, 90° is E, 180° is S and 270° is W – is the direction water	N/A

		is flowing.	
8. Dissolved oxygen	The amount of gaseous oxygen that has dissolved into a body of water. Dissolved oxygen (DO) saturation is influenced by temperature and salinity	Milligrams/liter (mg/L) Parts per million (ppm)	Hypoxia < 2 mg/L Anoxia < 0.5 mg/LDO saturation 5ºC, 0‰ = 12.8 mg/L 30ºC, 35‰ = 6.2 mg/L
9. pH	A measure of how acidic or basic (alkaline) a solution is on a scale of 0-14.	pH units range from 0 (highly acidic) to 14 (highly basic) on an exponential scale	Normal ranges: Freshwater (0 ppt) = pH 7 Ocean water (>30 ppt) = 8.0 – 8.6 Brackish water (0 – 30 ppt) = 7 - < 8.0
10. Oxygen Reduction Potential (ORP)	The ability to donate or receive electrons.	mVolts	~ 150mV – 250mV in water column
11. Turbidity	The measure of relative clarity of a liquid, an optical characteristic of water measuring the amount of light that is scattered by material in the water when a light is shined	Nephelometric Turbidity Units (**NTU**) measured with a nephelometer. Field measured as "secchi depth" in meters or feet. The lower the secchi depth", the greater the turbidity. The equivalent secchi depth will vary with	FDEP – potential turbidity producing activities (resuspension

	through it.	the type of particulate present in water column.	events) should not exceed 29 NTU (38 cm secchi depth) above ambient levels. Highly turbid environments are typically greater than 100 NTU (16 cm secchi depth). Secchi depth (cm) = $398.09(NTU)^{-0.6999}$
12. Chlorophyll	Plant pigment used by phytoplankton to photosynthesize; the most commonly used parameter for monitoring phytoplankton biomass and nutrient status, as an index of water quality by measuring the amount chlorophyll a in the water.	µg/L or parts per million (ppm)	< 7 µg/L - desirable 7 – 15 µg/L – less than desirable 15 µg/L - undesirable
13. Blue-Green algae	Bacteria that have qualities similar to algae and other plants. These bacteria	µg/L or parts per million (ppm)	N/A

	are cyanobacteria – cyan means "blue-green" – and are commonly found on land and in lakes, rivers, ponds, and in estuaries and marine water.		
14. Colored Dissolved Organic Matter (CDOM)	Optically measurable component of the dissolved organic matter in water.	Relative Fluorescence Units (RFUs), which can be converted to estimate absorption coefficients (reported in units of m^{-1})	Range from 0.05 m^{-} to well over 100 m^{-1}. Absorption coefficients increase with decreasing wavelength. Water with high CDOM typically has a dark brown "tea" color
15. Nitrogen as Nitrate + Nitrite	Nitrites (NO_2) and Nitrates (NO_3^-) are mainly produced for use as fertilizers in agriculture because of their high solubility and biodegradability. The main nitrates are ammonium, sodium, potassium, and calcium salts.	mg/L or parts per million (ppm) also as a molar concentration (µmol)	Recommended level for estuaries: 0.01 to .1 mg/l phosphorus and 0.1 to 1 mg/l of nitrogen (10:1 ratio of N:P)
16. Phosphate	Phosphates enter lakes, ponds, rivers, estuaries, and the ocean from various primary sources such as inorganic fertilizers,	mg/L or parts per million (ppm) also as a molar concentration (µmol)	Recommended level for estuaries: 0.01 to .1 mg/l

<table>
<tr><td></td><td>wastewater treatment from municipal sources, runoff from feed lots, soaps and detergents, and industrial processes.</td><td></td><td>phosphorus and 0.1 to 1 mg/l of nitrogen (10:1 ratio of N:P)</td></tr>
<tr><td>17. Rainfall</td><td>Amount of rain.</td><td>Usually measured in centimeters (cm) or inches over a 24 hour period.</td><td>N/A</td></tr>
<tr><td>18. Wind speed</td><td>Speed of wind.</td><td>Measured using an anemometer in meters/second (m/s) or miles/hour. Typically measured by the “Beaufort Scale” – 1 to 12 – from calm (0m/s) to hurricane speed (>32.7m/s, 73 mph)</td><td>N/A</td></tr>
<tr><td>19. Wind direction</td><td>Direction from which wind originates.</td><td>Measured in degrees (°) – north (0°), east (90°), south (180°), and west (270°)</td><td>N/A</td></tr>
<tr><td>20. Air temperature</td><td>Measure of heat in air.</td><td>ºC. (centigrade) or ºF. (Fahrenheit)
Conversion factor:
(ºC. x 1.8 +32 = ºF.)</td><td>N/A</td></tr>
<tr><td>21. Barometric pressure</td><td>A measure of the weight of the air in the atmosphere.</td><td>There are many barometric pressure units, the most common of which are included in the table below.
<table>
<tr><th>Name</th><th>Symb-ol</th><th>Relation to SI</th></tr>
<tr><td>pascal (SI unit)</td><td>Pa</td><td>N m-2 = kg m-1 s-2</td></tr>
<tr><td>hectopascal</td><td>hPa</td><td>1 hPa = 100 Pa</td></tr>
<tr><td>bar</td><td>bar</td><td>1 bar = 100 000 Pa</td></tr>
<tr><td>millibar</td><td>mbar</td><td>1 mbar = 100 Pa</td></tr>
<tr><td>torr</td><td>torr</td><td>1 torr ~ 133.322 Pa</td></tr>
</table></td><td>N/A</td></tr>
</table>

		millimetre of mercury (conventional)	mmHg	1 mmHg ~ 133.322 Pa	
		pounds per square inch	psi	1 psi ~ 6894.757 Pa	

ADDITIONAL RESOURCES

http://teamorca.org/orca/orca-why-monitor.cfm

http://api.kilroydata.org/public/

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INDIAN RIVER IMPACT 100
WOMEN AND PHILANTHROPY MAKING A DIFFERENCE