

# Muddy Hands

Soil and Water Information for Educators Brought to You by the Lake and Geauga County Soil and Water Conservation Districts



## Calling All Clouds

Can we really predict the weather by looking at the clouds? Clouds each tell a story of what is happening or what is going to happen. They forecast the weather and the wind brings it to us.

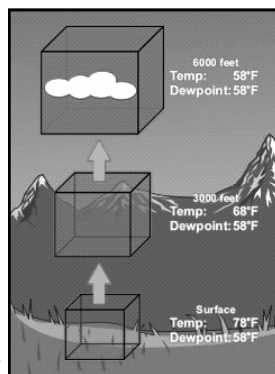
There are ten different types of clouds that can fill our northeastern Ohio sky. They have been grouped into three categories; cirrus, cumulus and stratus. The names for these three groups of clouds have Latin origins. Cirrus means "locks of hair" and cirrus clouds are wispy in appearance. Cumulus means "heap" or "pile"; these clouds are clumpy or fluffy like mashed potatoes. Stratus means "layers"; these clouds are large horizontal blankets. The combination of these words are used to name specific cloud formations.

The highest clouds are cirrus clouds. These clouds are wispy, made of ice crystals and are found at 16,500 to 50,000 feet above sea level. The three "cirri form" cloud types are cirrus, cirrocumulus, and cirrostratus. These clouds indicate that the weather is going to change within the next 24 hours. They are found at the leading edge of a weather front, warm or cold.

The middle level clouds, alto-stratus and altocumulus are found closer to the ground at about 6,500 feet. Altostratus clouds are usually grey in color, are made of layers and sometimes are fibrous in appearance.

Precipitation from these clouds rarely reaches the ground, and if it does it is very light. Altocumulus clouds come in varying shapes including rolls, puffs, and layers. Again, rain from these clouds usually evaporates before it reaches the earth.

The low clouds closest to the earth are cumulus, stratocumulus, nimbostratus, and stratus. They are found less than 6,500 above the earth's surface. Stratus clouds are grey in color and usually form near the ground. When they form on the ground, this is fog. Nimbostratus are rain clouds and produce the all day rains like the rains responsible for the flooding last July. Stratocumulus are lumpy winter clouds that occasionally produce



precipitation. Cumulus clouds are warm weather clouds. These clouds look like heads of cauliflower. They sometimes produce light periods of rain, and occasionally they can turn into thunderstorm clouds.

Finally, we have the cumulonimbus clouds or the thunderhead. These anvil shaped clouds are the ones that produce heavy hail, lightning and tornadoes. This cloud also produces many other clouds and can be considered a cloud factory.

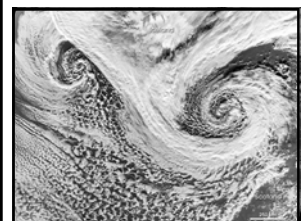
These are the ten main cloud formations. Within each cloud type there are many variations. Take a look outside see if you can identify the clouds and predict what weather will come your way!

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There is no such thing as bad weather, only different kinds of good weather  
-John Ruskin



"A lake is the landscape's most beautiful and expressive feature. It is earth's eye; looking into which the beholder measures the depth of his own nature."

-Henry David Thoreau

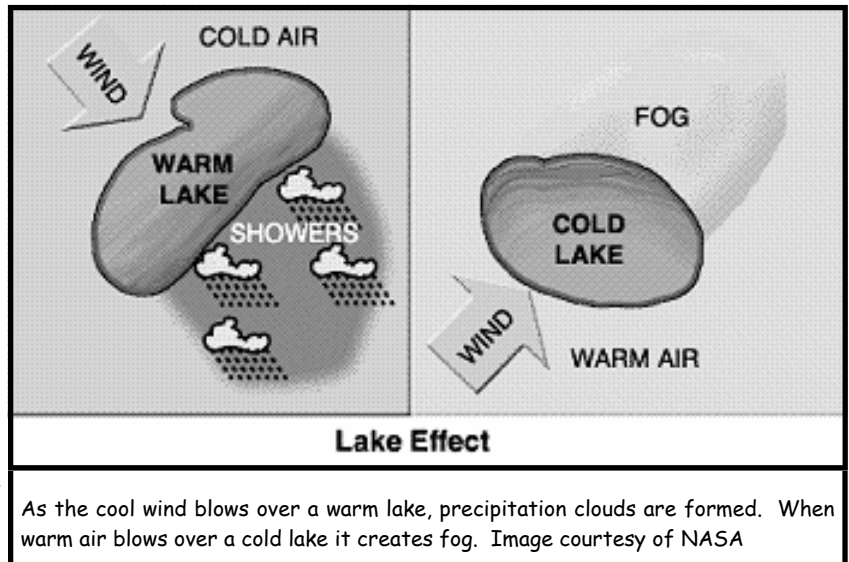


## Living with Lake Effect

In Northeast Ohio, we are accustomed to hearing the word 'lake-effect' used only between October and April. But Lake Erie affects our climate year round, in ways that aren't necessarily measured in feet of accumulation.

Rising warm air is the basis for most of the local weather phenomena that occurs around large lakes. If you have seen large birds circling in the air without flapping, you have seen the power of rising warm air. These air masses are called thermals. When a column of air starts rising, cooler air rushes along the earth's surface to take its place. During the day, especially on a sunny summer day, the air around us heats up as sunlight is absorbed by surfaces and radiates back into the air. The warmed air rises, and the cooler air over the lake gets pulled inland to take its place. This air has been cooled by the water (even in the hottest of summers, the lake remains below 80 degrees). Water absorbs heat from the sun and from the air around it and redistributes it into the water column through wave and current action. This has the effect of 'burying' the heat and keeping it from being conducted back into the air. The breeze coming off Lake Erie can cool the air temperature for several miles inland. In the summer, it isn't uncommon to hear the weatherman report the expected high temperature, followed by 'cooler by the lake.' Sea breezes off the ocean are caused by the same series of events, which is why kite-flying and wind surfing are such common ocean-front hobbies.

The National Weather Service has coined the term 'Oasis Effect' to describe a phenomenon that happens around the Great Lakes in the spring and early summer, when the lakes are still colder than surrounding air. Under certain conditions, warm, moist air rises off of the land and creates scattered clouds - not enough for rain, but enough to turn a sunny day overcast. But near large lakes, the cooler, drier air over the water won't form clouds, and that sunny weather spreads downwind of the lake. You can tell this is happening by comparing the weather reports from Cleveland or Ashtabula with those of inland towns like Akron or Mansfield.



Lake Erie also affects temperature extremes. High temperatures aren't as high and low temperatures aren't as low near a lake. All that water absorbs heat all summer and releases it all winter, even if the lake is iced over. Lake Erie, even when covered in ice, is still 33 degrees. It will never get colder than that, because it never freezes solid under its cap of ice. A 10 degree wind blowing across a 33 degree lake will actually warm up a bit. A 95 degree wind blowing across a 75 degree lake will cool down a bit. The lake is essentially a temperature buffer. This delays and lengthens the growing season near the lake shore, and helps protect our nursery, produce, and grape crops from frost in most years. Farmers near the lake shore can harvest later into the fall. They also aren't as likely to lose orchard trees and sensitive blossoms to heavy spring freezes, making it easier to raise peaches, grapes, cherries and apples.

Our lake-effect climate is pretty unique. It brings us not only a surplus of snow, but also sunny spring weather, cool summer breezes to play with and enjoy, and a fall that lingers just a little later in the year. The only other place in the United States that sees lake effects on their weather is the Great Salt Lake area in Utah. So the next time a snow day disrupts your school schedule, just picture yourself on summer vacation, sitting back and enjoying the lake effect!



## How Weather Works!

### Cold Fronts

Fill a small glass aquarium halfway with hot water. Take 2-3 cups ice cold water and add blue food coloring to it. Show pictures of the progression of weather from high cirrus clouds down to low stratus and rain clouds (weather.com is a good source). Discuss the difference in density of warm and cold air masses. Pour the ice cold colored water SLOWLY down the side of the tank into the hot water. You should see a wedge develop, then layers and then the colored water mixes throughout.



### Air Flow/Lake Effect

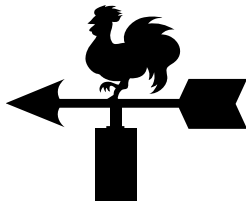


Place a block of ice (as big as will fit) inside one end of an empty glass aquarium. Take a lit incense stick and hold it horizontally over the ice end of the aquarium. The smoke will travel downwards and across the bottom in a downdraft. As it reaches the other side of the aquarium it will travel up in an updraft. You could add a candle or other heat source, such as warm water, to the end to increase the speed of airflow.

### Weather Vane

#### Materials:

- sharpened pencil
- index card
- straight pin
- straw
- butter dish with lid
- marker
- lump of modeling clay



Cut an index card into the shape of the ends of an arrow and tape to the straw ends. Balance the straw on your finger to find the balance point then push the straight pin through both sides of the straw at that point (parallel to arrow ends). Push the pin into the eraser end of the pencil. On the butter dish lid write the compass points-N,S,E,W. Place a lump of modeling clay in the tub and replace the lid. Push the pencil end firmly through the lid and into the clay. Place the wind vane in an exposed area so the wind can reach it from all directions. Orient the lid with a compass and record the direction.

### Wind and Weather Scavenger Hunt

Have students find the following:

- Blowing leaves
- Clouds moving
- The scent of something
- Ripples on water
- Smoke rising
- Birds soaring
- Sun shining
- Rain drops
- Wind blowing
- Moisture on a windowpane
- Flag flying
- Trees swaying
- Leaves rustling
- An umbrella
- A raincoat
- A winter coat
- Hat
- Gloves
- Scarf
- Seeds
- Bubbles
- Snow
- Rain
- Lightning
- Overcast skies

### Wind

Use a hair dryer to hold a ping pong ball aloft; this demonstrates how updrafts can keep a raindrop aloft. Have students blow bubbles or seeds and see who can keep them aloft the longest or get them to a finish line first. The wind carries pollen, seeds, spores, spiders, and scents toward predators. It also helps birds of prey to soar, blows leaves off of trees, and evens carries pollution. Where did your wind blow in from? Where would your bubbles or seeds end up if they got carried away?

Activities are adapted from National Association for Interpretation's Interpretation Weather Booklet. For more information on this and other booklets go to [www.nairegions.org/4](http://www.nairegions.org/4).

## Muddy Hands

### Ohio Conservation Teacher of the Year



The purpose of this contest is to recognize the outstanding conservation education efforts of Ohio's Teachers. Teachers in grades K-6 and grades 7-12 will be recognized in two separate categories. Details about the contest can be found on the Lake and Geauga SWCD websites listed below or by contacting the District offices. Call 440-350-2730 (Lake SWCD) or 440-834-1122 (Gauga SWCD) for contest guidelines and application information. There will be a local prize offered at the county level, and the winners of each category will be eligible for state competition. Let's recognize our outstanding Lake and Geauga County teachers by nominating them today. Applications are due to SWCD's by February 9, 2007.

#### Staff Changes at Geauga SWCD

Help welcome back Katie Nainiger, Conservation Education Coordinator. She is returning after an extended maternity leave to join the Geauga SWCD team again! She previously worked at Lake Metroparks as the Wildlife Education Coordinator. Joining her on the education staff is Ron Etling, District Conservation Educator. Ron received a Bachelor of Science in Education from Kent State University where he continues to teach outdoor education on a part-time basis. Ron has been an educator for the past 38 years and has worked professionally as a teacher, naturalist, conservationist, and coach. They look forward to the growth and future of the Geauga SWCD conservation education program. Congratulations and welcome.

**RAISE** The Regional Alliance for Informal Science Education, is an alliance of 19 organizations of informal science providers. Its goal is to make a difference in the way science is taught, presented, and learned. For more information click onto <http://www.RaiseOhio.org>.

Thank you to the Western Reserve Federation of Conservationists for sponsoring Muddy Hands and conservation education in Northeast Ohio

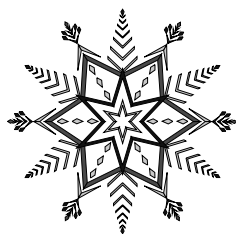
#### Your SWCD Contacts:

##### **Geauga SWCD-**

Katie Nainiger  
Conservation Education Coordinator  
Ron Etling  
District Conservation Educator  
440-834-1122  
PO Box 410, Burton, Ohio 44021  
website: <http://www.geaugaswcd.com>

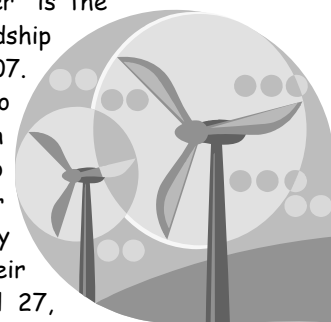
##### **Lake SWCD-** Beth Landers

Education Coordinator  
440-350-2730  
125 East Erie St., Painesville, Ohio 44077  
website: <http://www.lakecountyohio.org/soil>



#### Getting Students Involved in Conservation

Once again, Lake and Geauga County SWCD's are sponsoring a Conservation Poster Contest. The contest is held in conjunction with the National Association of Conservation Districts, the Ohio Federation of Soil & Water Conservation Districts and Ohio Department of Natural Resources Division of Soil and Water Conservation. "Conservation's Power" is the theme for Soil and Water Stewardship Week April 29 through May 6, 2007. The purpose of the contest is to instill in our youth an appreciation for the environment and the need to protect our precious soil and water resources. Lake and Geauga County schools must submit posters to their District office on or before April 27, 2007, or call their local SWCD office by April 16, 2007 to arrange for the District to collect them by the deadline. Judges will consider neatness, choice of color, and adherence to the rules. Prizes will be awarded for local winners. All posters become the property of Lake or Geauga SWCD's, unless otherwise requested. Please call your SWCD or visit their website.



#### What's New at Geauga SWCD

"Riparian Rescue" and "Oil, Toil and Trouble" programs! Find out more about these exciting new programs at [www.geaugaswcd.com](http://www.geaugaswcd.com).

##### Save the Date

Wonders of Watersheds education workshop this summer  
June 25-29, 2007

Past Issues of Muddy Hands-Get your copy  
Contact your SWCD for these topics and more!

Winter 2006-Nature Deficit Disorder/Experiencing Education  
Fall 2006-History Flowing By/Hydroelectric Generator  
Fall 2005-Wetlands, rain, storm water  
Winter 2005-Cycles; water, calcium and carbon  
Spring 2005-Ohio's Wildlife Making a Comeback  
Fall 2004-Environmental Education  
Spring 2004-Watershed Awareness/SQM  
Winter 2003-Wildlife in Winter/Animal Tracks  
Fall-2002-The Dirt on Soil/Erosion