

## Photo Description



This picture shows a beach on a foggy day. Many people are playing in the water and walking on the sand. There are tall buildings in the background that look blurry because of the fog. Seagulls are flying and standing on the wet sand near the ocean waves.

## Scientific Phenomena

The Anchoring Phenomenon in this image is fog formation over a coastal environment. This occurs when warm, moist air moves over cooler ocean water, causing water vapor to condense into tiny water droplets suspended in the air. The temperature difference between the land and ocean creates the perfect conditions for this weather phenomenon, which is why coastal areas frequently experience fog, especially during certain times of day or seasons.

## Core Science Concepts

1. Water Cycle in Action: The fog demonstrates evaporation from the ocean and condensation in the air, showing how water changes between liquid and gas states.
2. Weather Patterns: Fog is a type of weather that affects visibility and occurs when specific temperature and humidity conditions are met.
3. Ocean and Land Interactions: The different temperatures of water and land create conditions that influence local weather patterns.
4. States of Matter: The image shows water in multiple forms - liquid ocean water, water vapor in the air, and tiny liquid droplets in the fog.

### Pedagogical Tip:

Use this image to help students make connections between weather they observe at home and the scientific processes behind it. Ask them to share their own experiences with foggy days to build on their prior knowledge.

### UDL Suggestions:

Provide multiple ways for students to express their observations by offering drawing, verbal descriptions, or simple charts to record what they notice about the weather conditions in the photo.

## Zoom In / Zoom Out

1. Zoom In: At the microscopic level, tiny water droplets in the fog are so small they float in the air. These droplets form when water vapor molecules slow down and stick together as the air cools.

2. Zoom Out: This coastal fog is part of larger weather systems that can affect entire regions. The fog connects to global water cycle patterns where water moves from oceans to atmosphere to land and back again.

### Discussion Questions

1. What do you think would happen to the fog if the sun came out? (Bloom's: Predict | DOK: 2)
2. How is fog the same as or different from clouds you see in the sky? (Bloom's: Compare | DOK: 2)
3. Why do you think some parts of the picture are harder to see than others? (Bloom's: Analyze | DOK: 3)
4. What evidence can you find in the picture that shows water in different forms? (Bloom's: Evaluate | DOK: 3)

### Potential Student Misconceptions

1. Misconception: "Fog is smoke or pollution from the buildings."

Clarification: Fog is made of tiny water droplets, just like clouds, but closer to the ground.

2. Misconception: "The buildings are disappearing."

Clarification: The buildings are still there, but the fog blocks our view of them, like looking through a cloudy window.

3. Misconception: "Fog only happens at the beach."

Clarification: Fog can form anywhere when the right temperature and humidity conditions exist, including over lakes, rivers, and even on land.

### Cross-Curricular Ideas

1. Mathematics - Measuring Visibility: Have students measure how far they can see across the classroom by placing objects at different distances and recording which ones are still visible. Create a simple bar graph comparing "clear day visibility" vs. "foggy day visibility" using the photo as a reference.
2. ELA - Weather Stories: Students can write or dictate simple sentences about what they see in the photo, using descriptive words like "foggy," "blurry," and "misty." Create a class book titled "A Day at the Foggy Beach" with student illustrations and descriptions.
3. Social Studies - Coastal Communities: Discuss how people who live near beaches experience fog and how it affects their daily activities. Talk about what beach visitors (like those in the photo) do when it's foggy versus sunny, connecting to community life near water.
4. Art - Layering and Blending: Have students create foggy landscapes using watercolors or chalk, blending colors to show how fog makes things appear blurry. They can paint buildings, beaches, or trees and then add white or gray washes to demonstrate how fog hides details.

### STEM Career Connection

1. Meteorologist (Weather Scientist): A meteorologist studies weather patterns like fog, rain, and snow. They use special tools to measure temperature and humidity to predict what the weather will be. This helps people plan beach days and know when to bring an umbrella!

Average Annual Salary: \$97,000 USD

2. Oceanographer (Ocean Scientist): An oceanographer studies the ocean and how it affects weather and life near the coast. They learn about water temperature, waves, and how the ocean creates fog. These scientists help us understand why beaches and oceans are so important.

Average Annual Salary: \$67,000 USD

3. Environmental Engineer: An environmental engineer studies how weather, water, and air affect communities and buildings near beaches and coasts. They help design buildings and plan cities so people stay safe during foggy or stormy weather.

Average Annual Salary: \$96,000 USD

### NGSS Connections

- Performance Expectation: 2-ESS1-1 Use information from several sources to provide evidence that Earth events can occur quickly or slowly.
- Disciplinary Core Ideas: 2-ESS1.C and K-ESS2.D
- Crosscutting Concepts: Patterns and Cause and Effect

### Science Vocabulary

- \* Fog: A cloud that forms close to the ground made of tiny water droplets.
- \* Condensation: When water vapor cools down and changes back into liquid water droplets.
- \* Water vapor: Water in gas form that you cannot see in the air.
- \* Evaporation: When liquid water changes into water vapor and goes into the air.
- \* Humidity: The amount of water vapor in the air.
- \* Visibility: How far you can see clearly through the air.

### External Resources

Children's Books:

- Clouds by Marion Dane Bauer
- What Is Weather? by Robin Johnson
- Water Cycle by Rebecca Olien