

# IOWA DEPARTMENT OF NATURAL RESOURCES

LEADING IOWANS IN CARING FOR OUR NATURAL RESOURCES

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## Did You Know?

### Life Under the Ice

It's cold outside! Falling temperatures mark the start of ice formation on many of Iowa's lakes. Ice formation on lakes reveals many of water's unique properties. Unlike many other substances, water is less dense when in solid form (ice) because of the crystalline structure of frozen water. In fact, in winter, Iowa lakes often reverse-stratify, meaning that cold waters overlay warmer waters. Because water is most dense around 39 degrees F, water at this temperature sinks to the bottom of the lake, and water between 32-39 degrees sits closer to the lake surface with the coldest water lying just under the surface of the ice. If water was more dense when frozen, like most substances, ice would form on the bottom of lakes. This would have major effects on the lake ecosystem, as it would minimize the amount of food available for fish, harm many aquatic plants and many invertebrates, and eliminate the sport of ice fishing.

Ice formation requires sustained below freezing temperatures for a long period of time. Water has a very high specific heat, which means that it takes a lot of work to raise or lower the temperature. Thus, freezing temperatures in November and December may not result in ice formation on Iowa lakes until late December or early January. Because a great deal of energy is needed to warm water, lakes stay frozen and waters extremely cold well into the spring. Indeed, the physical properties of water dictate why and when we see ice begin to form on Iowa lakes.

