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# Which Animal Hibernates The Longest?



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Many northern animals hibernate to escape the harsh winter conditions. But a new study shows that one animal in particular does it longer than the others — staying completely frozen for more than half a year at a time.

It's the free-living wood frog (*Lithobates [Rana] sylvaticus*), an amphibian that's found in a broad geographic area ranging from the Southeastern United States to the Brooks Range of Alaska and the Mackenzie River Delta of Arctic Canada.

New research shows that **its deep-freeze period can extend up to seven months a year**, which is considerably longer than we'd previously believed. Aside from some insects and microbes, the only other animal capable of such extraordinary hibernating abilities is the Siberian salamander, which can stay frozen for four to five months.

An article in *Alaska Dispatch* **explains more:**

*Freezing imperils most animals because it dries out their cells, and ultimately their bodies. But wood frogs and other freeze-tolerant animals have methods of protecting their cells, sometimes with a natural antifreeze material. "In the case of wood frogs, it's sugar — blood sugar, glucose," said study co-author Brian Barnes, director of UAF's Institute of Arctic Biology...*

*What appears to give northern Alaska frogs their special powers to survive winter conditions is a buildup of glucose during several freeze-thaw cycles in the fall, Barnes said. "Frogs in nature are freezing multiple times," he said. Those cycles — about a dozen times per fall for the frogs monitored in the study — appear to trigger repeated doses of adrenaline that causes the glycogen in the frogs' livers to break down into glucose, he said.*

*Frogs out in natural conditions had glucose levels much higher than what had been detected in prior laboratory tests, where frogs were generally frozen only once, he said. And frogs in the study were able to survive even after their bodies had cooled to minus 0.4 degrees F, though Barnes said he and his colleague believe the animals' bodies can chill to much colder temperatures.*

Interestingly, the frogs' deep-freeze capabilities could help with biomedical research, including benefits to people needing organ transplants and other medical treatment.

**Read the entire study at *Journal of Experimental Biology*: "[Wood frog adaptations to overwintering in Alaska: New limits to freezing tolerance.](#)"**

Image: Ned Rozell via Alaska Dispatch

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