

ASK THE EXPERTS

If you have a question about water related issues, riparian rights, and/or lakes and streams, etc., let us know by email or snail mail.

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Our experts include our riparian attorney, a biologist, a limnologist, an engineer, a college professor and a state agency official. They look forward to responding to your question.

Question What are the streaks I sometimes see on lakes during windy days?

Answer: These streaks, formed due to the effects of Langmuir circulation, consist of floating debris or foam (Figure 1). When the wind blows steadily in one direction at a moderate speed, the water begins to form rotating tubes that run parallel, in the same direction as the wind (Figure 2). The physics of the formation of these tubes is quite complicated and still a focus of research, but likely involves differences in shear stress due to the wind, as well as surface waves. These tubes rotate in opposite directions, so that the foam and other materials come together to form the often-parallel white streaks you see on the surface. The typical depth of these tubes (also known as cells) is 4-6 meters, though in large water bodies they can reach 200 meters below the surface. These streaks can range from a few meters in small water bodies such as lakes and rivers, to many kilometers in the ocean. This phenomenon was named after Irving Langmuir who described the formation of these streaks in the 1930s.

In the ocean, Langmuir circulation can affect how plankton is distributed and may also play a role in how oil droplets move after an oil spill. For riparians, Langmuir circulation can result in increased mixing of water which may decrease the water temperature at the lake or river surface.

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ML&SA Research and Development Coordinator



Figure 1. Photo of streaks formed by **Langmuir** circulation. Photo courtesy of Mmelugin, Creative Commons.

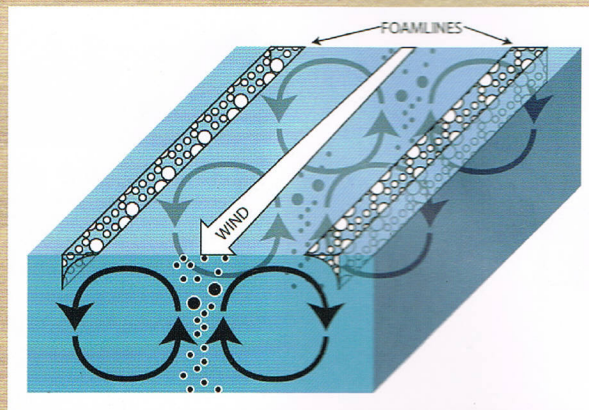


Figure 2. Diagram of Langmuir circulation. The black arrows represent the direction of the rotating water. Photo courtesy of Hydrated.