

Video 9

Climate Change in the Arctic, Part II The Jet Stream

Let's go back and ask a few questions.

How long before half of the Arctic ice cap has melted? It already has.

How warm will the Arctic Ocean become? We don't know.

How warm will the Arctic winds become? We don't know.

How warm will the tundra become? We don't know.

How long before the permafrost thaws enough to release planetary amounts of methane and carbon dioxide into the atmosphere? We don't know.

How much methane is now trapped by the permafrost? We don't know.

As the methane rises up into the atmosphere, how much warmer will our world become? We don't know.

And if all of this happens, how long will it take before the blanket of methane and carbon dioxide finally goes away? We don't know.

Keep in mind that coal and oil companies knowingly and willingly continue to earn profits from their filthy coal and oil.

Keep in mind that politicians around the world not only permit fossil fuel companies to continue poisoning our world, but pay them subsidies—enormous amounts of money—so that Big Oil can search for new oil fields . . . even in the Arctic.

Keep in mind that Big Oil uses a part of that money to buy advertising which reassures us—the taxpayers who paid our taxes to the governments, which then paid the money to Big Oil—that further drilling for oil is necessary for “economic growth”.

Young People of the World, if you are not scared, you are not paying attention.
If you are not outraged, you are not paying attention.

First comes fear. Then comes outrage. Then comes determination.

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The melting of the Arctic ice cap and the warming of the Arctic Ocean trigger a set of dominoes on the tundra, as you have seen. They also trigger another complex set of changes, up in our atmosphere.

You have heard about the Jet Stream, the powerful, high velocity winds that circle the top of our planet. You have seen diagrams of the jet streams in weather reports: wavy lines that zigzag around the North Pole. And you have heard that they somehow affect our weather further south.

These powerful winds are created by the fact that warm air over the middle latitudes of our planet rises higher into the atmosphere than the cold air over the Arctic. The warm air at high elevations wants to pour into the low pressure area—the relative emptiness—to the north. The spinning of the Earth causes this air pouring northward to form the strong winds which circle the top of our world. (You can look up the Coriolis Effect, which explains how all of this works.)

But what if the atmosphere above the Arctic becomes warmer and warmer? The Arctic air rises higher and higher, so that the pressure difference between the tall warm air and the increasingly tall Arctic air diminishes. Less middle latitude air pours northward, and thus less air fuels the powerful winds of the jet stream.

Without the natural flow of air northward, the jet stream weakens. The tight zigzags become wobbly, flabby. The downward waves form a loop that reaches far to the south, carrying frigid Arctic air into the lower latitudes—thus bringing snow to Palestine and Egypt. The upward waves form a loop that reaches far to the north, bringing tropical air up to Alaska.

Sometimes the loops break off from the main jet stream system, then they sit somewhere, parking their cold air over Europe, parking their warm air over Siberia. If the loops carry wet air, the moisture can condense and the rain falls for days, creating floods. If the loops carry extremely dry air, and if they park themselves for a long time, they can bring drought.

This major change in the workings of a once healthy Earth—the weakening of the jet streams caused by the warming of the Arctic Ocean—is already happening. The “weird weather” that is becoming more and more frequent, has its origins at the top of the world.

So of course the best thing to do is to drill for more oil in the Arctic.

As you do your own research, please take a look at the excellent videos of Dr. Jennifer Francis, formerly at Rutgers University in New Jersey, USA, now at the Woods Hole Research Center in Massachusetts. Dr. Francis explains very clearly in her lectures, with diagrams and maps, why the farmers around the world are directly affected by the melting of the Arctic ice cap.

(I have never met her, but she is one of my heroines.)

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One more note about our good friend, the Arctic ice cap.

With the help of underwater drones which carry cameras into the cold Arctic waters, scientists can study the carpet of green algae that grows on the *underside* of the Arctic ice sheet during the summer. Using the sunlight which shines through the ice, the photosynthetic algae not only live, but flourish.

This garden of green is the foundation of the Arctic food chain. Tiny animals, such as copepods, graze along the underside of the ice, feasting on algae. Larger animals eat the smaller ones in a complex web which reaches from shrimp and pteropods to fish, to seals, to polar bears, and to whales. This food chain has flourished for eons of time.

But what happens as the great curving sheet of translucent ice . . . melts?

The algae slowly lose their habitat. The upside down continent, with pasture growing on the bottom, becomes smaller and smaller. (And warmer and warmer.)

What happens to the food chain?

What happens when the Arctic ice cap melts entirely during the sunny summers, as it may well do by the middle of the 21st Century?

One final question: Does anybody care?

Young People of the World, I hope with all of my heart that *you* care.

Thank you.

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John Slade

Saturday, February 9, 2019.