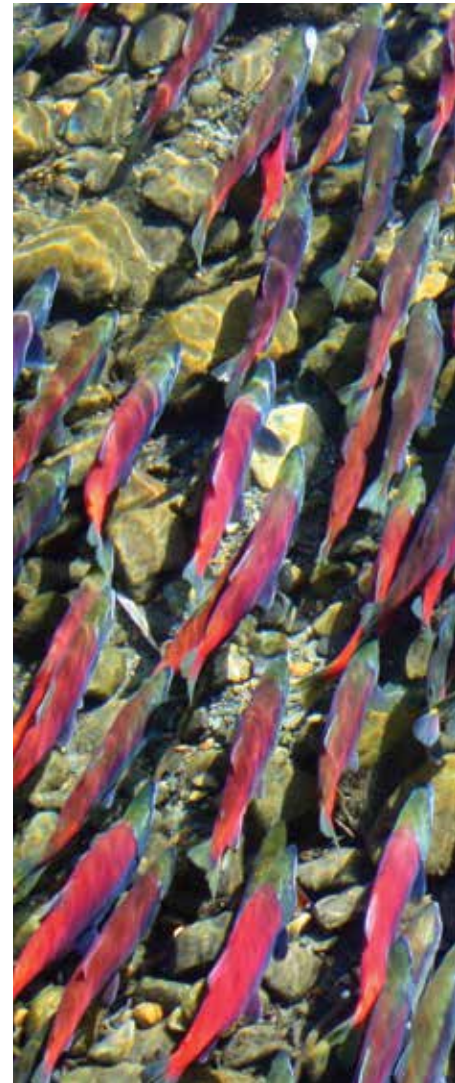




Scientists report that carbon emissions and our changing climate put salmon and steelhead populations at risk.

JUAN POZZA PHOTO



Asleep At The Wheel

Climate change is taking its toll on salmon and steelhead populations; yet there is hope if we act now. By TODD TANNER

SOMETIMES I READ THE NEWSPAPER OR JUMP ON THE WEB AND IT FEELS LIKE I'VE STEPPED ON AN INFORMATION LAND MINE. NEWS, AND QUASI-NEWS, AND ERSATZ NEWS EXPLODE IN EVERY DIRECTION, AND I HAVE TO WADE THROUGH "SYRIA LIKELY USED CHEMICAL WEAPONS" AND "CYPRUS REJECTS BANK DEPOSIT TAX" AND "SENATOR RIPS ON TIMBERLAKE" (THAT'S AN ACTUAL CNN HEADLINE, AS IS "BUS DRIVER CAUGHT READING BOOK") WITH THE HOPE THAT I'LL END UP BETTER INFORMED, RATHER THAN MERELY DAZED AND CONFUSED.

What I really need, though, is a way to screen out all the irrelevant stuff while letting the important information pass through. If I could build the perfect news filter — perhaps I should wire my landing net and my water purification filter to my laptop — I'd end up with far fewer stories vying for my attention and far more worthwhile information. And right at the top of the heap, above all the articles on the economy and President Obama's relationship with

Congress, would be two simple words: "Climate" and "Change."

The problem, of course, is that those same two words make our eyes glaze over. They're wrapped up in symbolism; they're political and contentious; they're code for Al Gore and the United Nations and liberal elitism stuffed into one huge, indigestible, anti-American fajita. For most of us, climate change is something that we consciously choose to ignore. It's not real,

and if it was, well ... seriously, what could we do about it?

Ah, but here's the thing. It is real. Every major scientific body on the planet agrees with the U.S. National Academy of Sciences (NAS), which says that climate change is happening, that people are causing it, and that our carbon emissions are putting our future at risk. There's not even serious debate about the issue any more. The NAS, which is the gold standard for science and research, has gone so far as to label climate change a settled fact. The real arguments now are about how much our temperatures are likely to rise, which specific problems we're liable to face, and what we can do to lessen the impacts.

And that's where salmon and steelhead come into the picture. When you love to fish for steelhead, like I do, and when you dream about passing on healthy fisheries to our

kids and our grandkids — I happen to have an 8-year-old son — you come to realize that ignoring the science is a recipe for disaster.

A few years ago I was on a media call with three Nobel-prize winning scientists. All three were biologists and all three told the press that the future was dark for Pacific salmon. In fact, the common theme was that we were liable to lose the vast majority of our anadromous salmonoids to climate change over the next 40 or 50 years. Of course, you won't hear that kind of gloom and doom in the outdoor press, but the scientists who are studying



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JODY ANN PHOTO PHOTO

climate and its impacts, and who have a sophisticated understanding of how ecosystems function, are amazed at the speed of the changes they're measuring. I've actually had scientists tell me—though not for attribution—that they're scared to death by what they see happening around them.

So how will our carbon emissions and our changing climate put our salmon and steelhead at risk? Let's take a look.

OCEAN ACIDITY Humans dump a huge amount of carbon into the air—more than 30,000,000,000 tons (yes, billions) of CO₂

every single year. And every year, somewhere around 10,000,000,000 tons of that atmospheric CO₂ mixes with sea water and forms carbonic acid. As you might imagine, that much carbonic acid alters the pH of our ocean water. Right now our oceans are approximately 30 percent more acidic than they were in pre-industrial times. And as we continue to burn fossil fuels, organisms at the base of the food chain (like calcifying plankton and pteropods) are finding themselves more and more stressed by the changes to the chemistry of our ocean waters. Bottom line, when you mess with the food chain, you

make life awfully tough for salmon and steelhead.

WARMER OCEAN WATERS

You might be surprised by this, but a large amount of the excess energy trapped by our current overabundance of greenhouse gasses ends up in our oceans. As a result, they're growing warmer. In fact, a recent study shows that about 90 percent of the warming we've experienced so far has taken place in our oceans, and that our ocean temperature increases are accelerating. Warmer waters can shift ocean currents,

change the patterns of oceanic upwelling (where cold, nutrient-rich water from the depths is brought up to the surface), impact plankton distribution, and push salmon and steelhead northward toward cooler waters. In short, our addiction to fossil fuels is altering our saltwater environment right in front of our eyes. Our oceans are becoming warmer and more acidic, with regular disruptions to major elements of the food chain, and that's not good for salmon and steelhead—or for anglers.



Salmonids need cold, clean water to spawn, while eggs, alevin, fry and smolts require those same conditions to survive and prosper before they begin their journey to the ocean.

TOM YOUNG PHOTO

FRESH WATER Salmon and steelhead need cold, clean water to spawn, while eggs, alevin, fry and smolts require those same conditions to survive and prosper before they begin their journey to the ocean. Our changing climate puts all that at risk. Global warming is raising water temperatures in our streams and rivers, and lowering dissolved oxygen levels. It's also having a major impact on the timing of our snowmelt and the severity of our storms and droughts. In addition, larger and more numerous western forest fires will likely lead to increased sediment in spawning areas, and to a decrease in stream-side shade. It's a bad idea to make life even tougher on our spawning salmon and steelhead, and on our juvenile fish, yet that's exactly what we're doing with human-caused climate change.

So how bad is it? Well, the National Wildlife Federation calls salmon the "canary in the coal mine" for climate change.

Trout Unlimited warns, "Trout and salmon are especially vulnerable to climate change and global warming because they are dependent on an abundance of clear, cold water. As coldwater habitats warm, rising temperatures will have negative impacts on all life phases of these fish—from eggs to juveniles to adults."

In their seminal report, "A Great Wave Rising," former

Oregon Chief of Fisheries Jim Martin and NWF climate expert Patty Glick lay the situation out in black and white: "Global warming is changing the waters of the Columbia and Snake rivers, with worse change to come. Like a great wave rising, global warming has emerged as a new over-arching threat to salmon as well as people ..."

It sounds grim, doesn't it? So is there hope? And what can we do?

Yes, there is hope. While climate change is already impacting our fisheries, and while we won't be able to roll back all those impacts or prevent the future warming that's already in the pipeline, we can still avoid the worst effects of global warming and we can still save our salmon and steelhead. But we have to step up, and we have to do it now.

There are two areas where

we need to focus our attention. The first is mitigation. There are any number of steps we can take to protect and restore our fisheries, and to ensure adequate supplies of clean, cold water for salmon and steelhead. Depending on the individual watershed, we may want to concentrate on enhancing riparian habitat, or removing dams, or guaranteeing minimum stream flows, or improving forestry practices, or enforcing sustainable harvest practices for commercial fisheries. All those steps can buy us time. Unfortunately, though, they're not enough — not by themselves.

The second one is a little tougher. We need to remove the "Kick Me! I'm An Angler!" sign that so many of us wear, and stop being so incredibly meek and mild. If we don't raise some hell and put climate change on the agenda in D.C.; if we don't demand that America steer toward clean, renewable energy; if we don't focus real political pressure on local, state and federal legislators; if we don't stand up for our fishing, and for our kids and our grandkids, then we're going to eventually lose it all — every last salmon run, every single steelhead river, our final chance to pass along a healthy natural world and a decent future.

A century ago, Teddy Roo-

sevelt told America:

"It is not the critic who counts; not the man who points out how the strong man stumbles, or where the doer of deeds could have done them better. The credit belongs to the man who is actually in the arena, whose face is marred by dust and sweat and blood; who strives valiantly; who errs, who comes short again and again, because there is no effort without error and shortcoming; but who does actually strive to do the deeds; who knows great enthusiasms, the great devotions; who spends himself in a worthy cause; who at the best knows in the end the triumph of high achievement, and who at the worst, if he fails, at least fails while daring greatly, so that his place shall never be with those cold and timid souls who neither know victory nor defeat."

The time for indifference, for caution, for indecision—the time for timidity—has passed. Our future is under attack. We need to address climate change now, before it's too late. **SSJ**

Todd Tanner is a passionate angler, a former fly fishing guide, and a longtime outdoor writer. He's also the chairman of Conservation Hawks, an organization focused on defending America's hunting and fishing.



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