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An open letter to all that it may concern:

I write to suggest a project(s) that can help alleviate some of our water management/ water shortage issues. This project can be implemented immediately and give positive effects very quickly. **If we start on Monday we will have results by Friday!**

One of our biggest water problems is having adequate amounts of COLD water available to maintain river habitat for the poor magnificent creatures who live there and can do nothing more than try to live through what we do to them.

Other complicating issues include evaporation from the reservoirs and salt water intrusion into the delta.

One management problem is in trying to deliver water for people to use while holding back water to protect and maintain the cold water fraction that needs to be stored so that it can be released to maintain the aquatic habitats in the rivers while also trying to prevent salt water intrusion into the delta, all at the same time.

Maintaining this cold water fraction requires holding back a volume of water that is much greater than the actual cold water fraction. This volume of water then becomes unavailable for other uses.

**If we can guarantee that there is more than sufficient cold water** to release for the river habitats then we can start to improve the environmental conditions of the rivers and for the creatures that depend on them.

If we can **improve the habitat and free up more water** to be delivered for cities and farmers then **people can also benefit.**

The Problem: Warm water.

We have big flat surfaced reservoirs out in the sun. The sun warms the top portion of all the water that it shines on. The reservoirs have to be kept deeper (more full) in order to protect and store cold water at the bottom of the reservoirs. Less water becomes available to be released for all purposes. The longer the water is exposed to the sun's

energy the warmer it becomes and an increasing amount of water is lost to evaporation. The evaporation process further decreases the total volume of water available..

The Solution: Lots and lots of cold water and shade. **Let's make cold water**  
We float large (**LARGE**) arrays of solar panels over the water (pontoons, barges, etc). Use the electricity from these solar panels to run refrigeration units/ heat pumps that chill the water.

**The shade provided by the solar panels will have an immediate effect by decreasing the amount of solar radiation hitting the water while also providing a source of electricity to run refrigeration units/ heat pumps.**

Using **air cooled** refrigeration units the water can be made cold. The cold water will sink to the bottom of the reservoir and become part of the stored cold water fraction. This will help protect the cold water supply and can even make more cold water increasing the volume of the cold water fraction.

The more surface area of the reservoir covered with solar cells, the greater the effects of the system. More of the water surface is shaded. **The solar energy intercepted and not hitting the water is used instead to make more cold water.** The bigger the surface area shaded the better we can decrease the amount of evaporation. **This will result in less water loss to evaporation..** This "saved" water will stay in the reservoir and can become available for use.

The more COLD water we can make means that more water can be shared amongst all of us (fish included). I don't think the farmer's or cities will complain that the water they get is "TOO COLD".

Farfetched? NO! This can all be done with off the shelf technology. Immediately!!  
Crazy? NO! Fish hatcheries have been chilling water for a long time now.  
Bad for the environment? NO! I am sure all the river creatures will benefit from any cold water we can provide **and more importantly guarantee.**  
Carbon footprint? Minimal. The materials are already produced. Once assembled the project would have virtually NO emissions.

Can it be done? ABSOLUTELY!! We cool sport arenas, concert halls, big box stores, warehouses and millions of homes, cars, refrigerated trailers and shipping containers. EVERYDAY!

**All that it takes is energy.**

**Let's use the energy already hitting the water and working against us to chill the water and instead work for everyone (fish and animals too).**

How much will it cost? Millions. Probably hundreds of millions. But on the other side of the equation, how much will it be worth to have more water available to be shared.

And if we get to the point where we are starting to get ice forming in the reservoirs and do not need the electricity for the chillers we could always put any extra into the electric grid.

Dams generally have some sort of electric transmission lines already associated with them. Excess electricity could even be a means of paying for these projects. The surface of reservoirs can be excellent places to situate large arrays of solar cells for photovoltaic generating systems. Much better than on land in the desert.

No terrestrial habitats would need to be destroyed while having the added benefit of reducing evaporation. Transmission lines associated with dams can easily transmit the photovoltaic electric power produced into our electric grid.

Any manmade reservoir can be "shaded" in this way. Any manmade reservoir that affects the water temperature and health of our river systems **should all** be set up with solar cells and water chillers/ refrigeration units/ heat pumps.

We do not have to be in total conflict. Let's work together for the common good. This is a "shovel ready" project that will have results THIS YEAR. **If we get started on Monday I can show you results by Friday!**

Yes, this is a very brief and simple explanation of a very complex but **simple solution**.

Please contact me for further details.

Sincerely,

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