

EARTH

GSA meeting: Water, water everywhere ... creating some to drink

HOUSTON – The Geological Society of America’s joint meeting kicked off Sunday, beginning a week filled with thousands of presentations on soil science, atmospheric science, education and evolution, paleontological discoveries, energy issues and Hurricanes Gustav and Ike — made particularly poignant by the Houston, Texas, setting.

One of the big issues of this conference is water. Many experts predict that the desire for freshwater is going to lead to international conflicts in the future. The United Nations estimates that more than a billion people in the world lack access to clean drinking water, which also causes the deaths of more than a million and a half children each year. And that’s only going to get worse as populations increase and some parts of the world become more arid due to climate change.

As such, more research is going into not only finding clean, sustainable sources of drinking water, but also into new technologies that make non-potable water drinkable. One particularly intriguing proposal involves converting old ships such as aircraft carriers into floating desalination plants. It’s no secret that many coastal regions lack abundant freshwater — even in the United States, where, for example, Los Angeles and areas upstream fight over Colorado River water and Virginia Beach fights saltwater intrusion into its freshwater aquifers. Both of these regions are already using desalination plants on land. Other arid areas also use desalination plants, such as Israel.

But what if those desalination plants were offshore and mobile, so that they could travel wherever freshwater is needed most — such as to a location suffering in the wake of a natural disaster like the 2004 tsunami that destroyed coastal water systems around the Indian Ocean, or the hurricanes that struck here in Houston and Galveston a couple weeks ago? Or regions in the midst of war, or recovering from a terrorist attack that altered the water supply?

These are the questions David Kremer of the University of Nevada in Las Vegas is asking — and answering. His idea is to take old U.S. Navy or Merchant Marine aircraft carriers and large ships that have been decommissioned but are being “mothballed” — kept in good enough care that should we suddenly need them, they are available — and turn them into mobile desalination plants. The ship-based plants could either be moored somewhere off the coast of a city in need of

water, or they could float around and move to locations as needed, he said in a presentation Sunday.

The military currently spends tens of millions of dollars to mothball a single ship. That money could instead be used to convert the ship into a desalination plant, Kreamer said, and serve a double purpose. The ship would be kept in operable shape, should it be needed, and it would be providing potable water to someone who needed it.

A couple of companies are working on this idea already, Kreamer said, including Water Standard Company, based in Houston. Gayle Collins, a spokesperson for Water Standard, says that such ships have the potential to provide enough water to provide a large city with all of its water needs. Another company is working on the idea in Australia, which is undergoing one of its worst droughts on record, and yet another company is working in Cyprus.

There are a lot of challenges facing this technology, Kreamer acknowledged. Costs are an issue, as desalination is still an expensive technology at between \$1.52 and \$5.70 per 1,000 gallons of water. Plus the water has to be transported from the ship to its intended location, either by pipeline (which would need to be constructed) or by another ship, which involves a whole lot of issues, ranging from whether or not the transport ship is clean enough to carry the pure drinking water to whether it can be balanced enough so as not to tip over with the increased water load.

Also, desalination plants use a lot of energy, so what type of energy is used and how much would need to be considered. Theoretically, though, such a plant could be run on wind turbines, underwater turbines, wave power, solar power — or even nuclear power, if the ship happened to already be a nuclear ship, as some U.S. Navy ships are.

Then there are security issues, including terrorists and pirates. However, Kreamer said, these floating desalination plants could “enhance humanitarian efforts and national security efforts,” potentially reducing future water conflicts both at home and abroad. And that’s worth considering, he said: “Would we be a more secure world if we had this?”

I am intrigued, to say the least. Stay tuned. We’ll be writing on this in the near future.

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