

# TECHNOLOGY ASSESSMENT AND GLOBALIZATION

bridges vol. 16, December 2007 / Pielke's Perspective

by [Roger Pielke, Jr.](#)

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Fresh sushi, it seems, can be found almost everywhere. Such casual observations of contemporary trends in the globalization of food are backed up by data. Our insatiable appetite for fresh fish has had a profound effect on world fish stocks. In 2006 a study published in [Science](#) estimated that 29 percent of all fished ocean species were being harvested unsustainably. As the world struggles to cope with the many challenges of globalization, which include protecting fish populations in the face of enormous demand, it is of particular importance to understand the role of technology in globalization and the role of technology assessment in our efforts to manage the effects of globalization.

According to Sasha Issenberg's fascinating exploration of the global sushi industry, [The Sushi Economy](#), the main people interested in catching mature western Atlantic bluefin tuna in the 1960s and early 1970s were sport fishermen looking for trophies. After documenting their catch they would dispose of the worthless fish, or if they were lucky, sell it for about five cents per pound to be processed into pet food. But everything changed in the early 1970s when Japan Airlines sought to fill the empty cargo holds of its jumbo passenger jets returning to Japan after bringing full shipments of electronics and other consumer goods to North America. A JAL employee named Akira Okazaki was given the challenge of finding appropriate goods to ship back to Japan, and he quickly zeroed in on the bluefin tuna found off the northeast shores of the United States and Canada.

There was one big technological obstacle to overcome: Tuna was valuable in Japan when fresh, but shipping the large fish packed in ice was prohibitively expensive due to the weight. But with necessity the mother of invention, it was not long before innovations in freezing, packing, and shipping technologies enabled a new market opportunity in the trade of bluefin tuna from the North Atlantic. The first North Atlantic tuna sold in Tokyo's Tsukiji Fish Market on August 14, 1972, were purchased for \$18 per pound, 50 percent higher than the shipping costs. In 2001, a 444-pound North Atlantic tuna sold for \$175,000, or close to \$400 per pound, an 800,000 percent price increase from the five cents per pound paid in the 1960s. Tuna would be pet food no more.

With the globalization of sushi involving so many fascinating aspects of culture, economics, and history, it would be easy to overlook the enabling role of technological innovation. But without the invention of a way to move fresh fish around the world, the fishing pressure on the stock of North Atlantic tuna would certainly have developed differently from the 1970s to the present. Low-technology innovations in freezing and packing associated with shipping seafood around

the world led to profound impacts on culture, markets, and the environment around the world. These effects were the indirect consequence of a trade opportunity made possible by the North American demand for Japanese technological innovations in consumer electronics. When my parents brought home our first color television in the early 1970s, they could not have envisioned that they were contributing in a small but significant way to forces of globalization that 30 years later have resulted in their grandchildren asking me for sushi as a treat from our local grocery store.

Technology assessment, as conventionally understood, involves developing some understanding of the future trajectory of technological innovations on matters of societal concern. This was explicit in the original legislation of the [US Office of Technology Assessment](#) (OTA), which defined technology assessment as providing "early indications of the probable beneficial and adverse impacts of the applications of technology."

But such foresight is simply not possible for many technologies and contexts, in part because no one is paying attention to what, in hindsight, turn out to be important innovations, and also because technologies shape the future in fundamentally unpredictable ways. In his 1973 presidential address to the [American Historical Association](#), historian Lynn White, Jr. suggested that technology assessment carried a defect in the "lack of a sense of depth in time." White provided many examples from the distant past. He explains how the invention of the chimney and flue contributed to class divisions of the later Middle Ages by enabling a fireplace in every room, thus allowing the wealthy to distance themselves from their servants. He also explains how the invention of the button changed how people viewed children in the later 16th and early 17th centuries. The button enabled more tightly fitting clothes and a corresponding reduction in pulmonary infections, dramatically lowering infant mortality, and increasing the attention that adults invested in children.

Examples of connections between seemingly innocuous innovations and global consequences are everywhere. In a fascinating study that might be characterized as forensic economics, M. Scott Taylor of the [University of Calgary](#) argues that a European innovation in the tanning of animal hides led directly to the slaughter and near extermination of the American Bison (or buffalo) in the latter part of the 19th century. Much like North Atlantic tuna, buffalo were once prized only as trophies. After being killed by hunters, their carcasses were typically left to rot on the Great Plains because their hides were not amenable to tanning for leather.

But when European demand for industrial leather grew, necessity once again was the mother of invention, and a new approach to tanning hides was sought and found. The ability to turn buffalo skins into leather led to an enormous demand in Europe, a corresponding increase in the price of buffalo hides, and a correspondingly dramatic increase in killing buffalo and exporting their skins, so much so that 30 million buffalo were hunted almost to extinction over a period of less than a decade. Aspiring technology assessors of the 1870s would have been hard pressed to notice, much less to anticipate, the effects of innovation in the European leather tanning industry before serious environmental consequences resulted on the North American continent.

Ultimately Lynn White, Jr. was concerned that we "illuminate the limitations as well as the possibilities of assessing

technology." One of the most important limitations may be that most technology assessment, at least as defined by the US OTA, is simply impossible. The stories of the tuna and the buffalo are a century apart, but they tell us some very important things about our efforts to manage technology in a globalizing world. Among these lessons: the processes of globalization are not new, their effects have always been fast in comparison to our ability to respond, and our ability to foresee the effects of technological innovation on our world are profoundly limited. Exploring the implications of these realities for understanding the role of technology in globalization, and for assessing technology to aid our efforts to manage the effects of globalization, increasingly occupies my scholarly interests and will be a frequent topic of my future writings.

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*Roger Pielke, Jr. serves as director of the Center for Science and Technology Policy Research. He has been on the faculty of the University of Colorado since 2001 and is a professor in the Environmental Studies Program and a fellow of the Cooperative Institute for Research in the Environmental Sciences (CIRES).*

