Nano-doom?: The Myths, Facts, and Uncertainties Surrounding the Environmental and Public Health Implications of Nanotechnology

Remarkable novel materials have sprung from the nanotechnology revolution, but the rate of innovation has outpaced the understanding of the environmental and public health implications of these technologies. As a result, some consumers are weary of nano-enabled products and government agencies are unsure of how to regulate the materials. A growing body of evidence suggests that only select types of nanoparticles in specific exposure scenarios present veritable risks (e.g., air-borne exposure to unagglomerated carbon nanotubes or aquatic exposure to nano-derived silver ions). The bulk of this knowledge has been generated by NSF/EPA-funded Centers aimed at quantifying nanomaterials risk, where risk is a function of both exposure and toxicity. Results from those centers will be reviewed with respect to individual nanomaterials classes (e.g., inorganic, metalloid, or organic nanomaterials). These empirical data are being used to elucidate design principles that enable the economic and environmentally sustainable development of next-generation nano-enabled devices while preserving their enhanced performance.

Desiree L. Plata
Assistant Professor, Civil and Environmental Engineering, Duke University

Desiree Plata is an Assistant Professor of Civil and Environmental Engineering at Duke University, home to the Center of the Environmental Implications of Nanotechnologies (CEINT). Plata's work focuses on the environmental impacts associated with nanomaterial synthesis, with a particular focus on carbon-based nanomaterials and gaseous emissions associated with those processes. Plata holds a PhD from MIT and the Woods Hole Oceanographic Institution in Environmental Chemistry and Chemical Oceanography and a BS in Chemistry from Union College (Schenectady NY). She is a two-time National Academy of Sciences Frontiers of Science Fellow and National Academy of Engineering Frontiers of Engineering Fellow.

