PROGRESS AND PLANS OF NATIONAL NANOTECHNOLOGY INITIATIVE (NNI) AGENCIES

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U.S. Department of Agriculture (USDA)[1]

Forest Service (FS)

Summary

Forest Service nanotechnology research supports departmental and agency priorities to facilitate rural prosperity and economic development, ensure productive and sustainable use of our National Forest System lands, and strengthen the stewardship of private lands through research and development. The primary focus of Forest Service nanotechnology research is on producing cellulose nanomaterials from wood and developing the science and technology for the application of cellulose nanomaterials in a broad range of industrial applications. Other nanotechnology research in the Forest Service includes understanding the nanostructure of wood and wood properties and wood-water interactions with nanotechnology techniques.

Plans and Priorities by Program Component Area (PCA)

PCA 1. Nanotechnology Signature Initiatives (NSIs) and Grand Challenges

PCA 3. Nanotechnology-Enabled Applications, Devices, and Systems

Most Forest Service nanotechnology R&D investments are in the manufacturing and development of science and technology for new products with cellulose nanomaterials. Partnering with the public-private partnership, P^{3}Nano, research and development priorities are to invest in previously funded projects deemed by industry experts to have commercialization potential.

The Forest Service is supporting the organization of the Advanced Commercialization of Nanocellulose: Critical Challenges Workshop, to be held May 7–8, 2019. This industry-led workshop is a follow-up to the 2014 FS-NNI "A Path Towards Commercialization" workshop,[2] and supports the NNI Nanomanufacturing NSI.

Key Technical Accomplishments by NNI Goal

Goal 2. Foster the Transfer of New Technologies into Products for Commercial and Public Benefit

To accelerate the cellulose nanocrystal concrete bridge demonstration project in Siskiyou County, California, the Forest Service has stepped up its project coordination with Oregon State University and Siskiyou County. The project is awaiting construction of the bridge by Siskiyou County.

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[2] See: https://www.nano.gov/node/1421

Forest Service experts are involved in three International Organization for Standardization (ISO) Technical Committee (TC) 229 (Nanotechnologies) cellulose nanomaterials projects to develop reports and technical specifications for different types of cellulose nanomaterials and characterization of cellulose nanomaterials. Forest Service experts are also involved in reviewing and revising existing ISO TC6 (Paper, board and pulps) standards to incorporate cellulose nanomaterials in the standards.