Forest Health Highlights:
North Dakota 2016

This report summarizes forest health observations and program activities in North Dakota in 2016 and includes an overview of notable emerging forest health issues. Site visits, forest health surveys and reports, and personal communication with natural resource and community forestry professionals form the basis of this report.

North Dakota contains approximately 806,000 acres of forestland, which accounts for 1.8 percent of the state's land area (Forests of North Dakota 2016). The top five species in the state by volume are cottonwood, bur oak, green ash, quaking aspen and Rocky Mountain juniper.

Conservation plantings such as windbreaks and living snow fences are a significant tree resource, once totaling as much as 55,000 miles of plantings. Community trees provide valuable ecosystem services in the northern Plains environment. Two college campuses have achieved Tree Campus USA designation and 51 cities qualify as a Tree City USA.

Forest Health Surveys

- The underbark temperature of ash trees at five sites in North Dakota was monitored during the winter of 2015-2016. Monitoring will resume in 2017 to gain information about the effect of the winter climate on underbark temperatures and the effect they may have on emerald ash borer (EAB) survivability in the North Dakota winter conditions.
- The North Dakota Department of Agriculture (NDDA) conducts Japanese beetle (*Popillia japonica*), gypsy moth (*Lymantria dispar*) and exotic wood borer trapping in the state. No gypsy moths have been detected since 2004 (Kangas). Japanese beetles have appeared every year since 2012 in decreasing numbers but in more counties and more varied land cover types. With Japanese beetle spread appearing imminent, the NDDA will continue surveying in 2017 and will focus on public awareness and outreach. The 2016 Exotic Wood Borer survey trapped none of the 11 species of state/national concern at its 12 trapping locations in cities and potential entry sites. All specimens collected from the families *Scolytidae*, *Cerambicidae* and *Curculionidae* were identified and recorded.
- A Meyer spruce health survey is ongoing to assess the health, disease susceptibility and suitability of this species for use in the northern Plains.
- An assessment of damage to bur oak plantings by woodpeckers foraging for larvae of the wasp *Callirhytis flavipes* under the bark of newer plantings is continuing.
- In 2015, a team visited a stand of limber pine in southwestern North Dakota. The trees appear to have a needle blight with Dothistroma-like symptoms but Diplodia-like spores. Jim Walla, forest pathologist with Northern Tree Specialties, continued this study in 2016, collecting samples and assessing needle blight incidence and severity. The identity of the fungus is unknown, so samples were sent to a geneticist at the Forestry and Agricultural Institute in South Africa for characterization. Preliminary assessments also identified a Dothistroma species on the needles that is similar to a new Dothistroma in the southern U.S.

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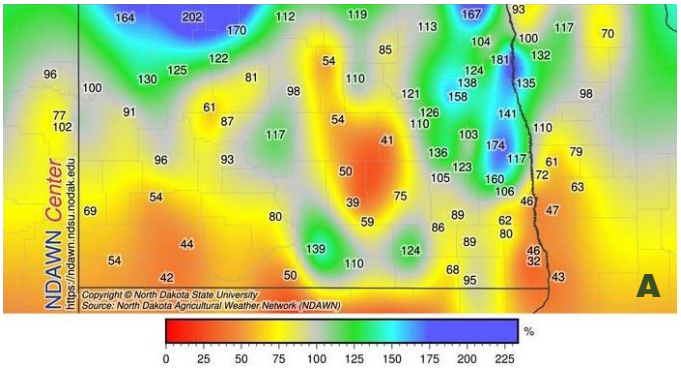
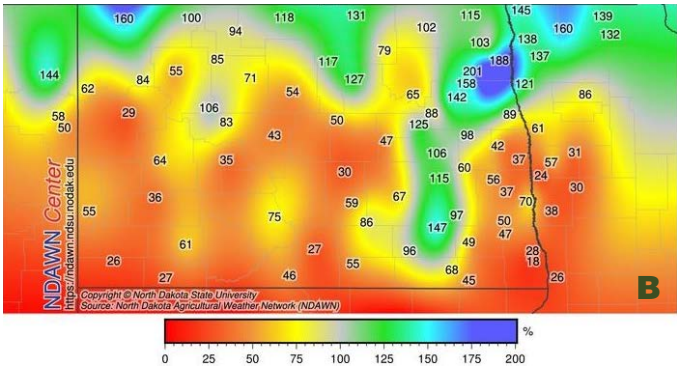
General Insect, Disease, Abiotic and Undetermined Trends of Significance

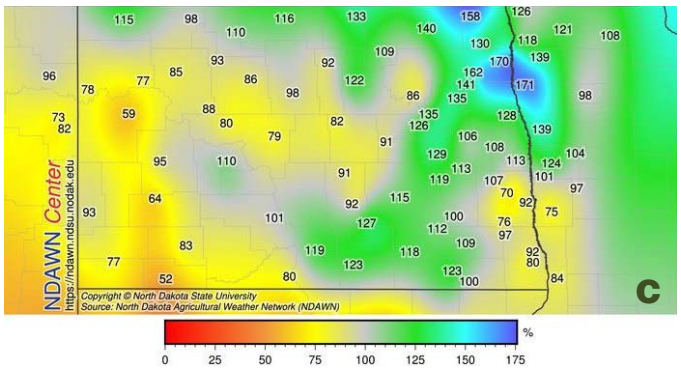
Weather-related Issues

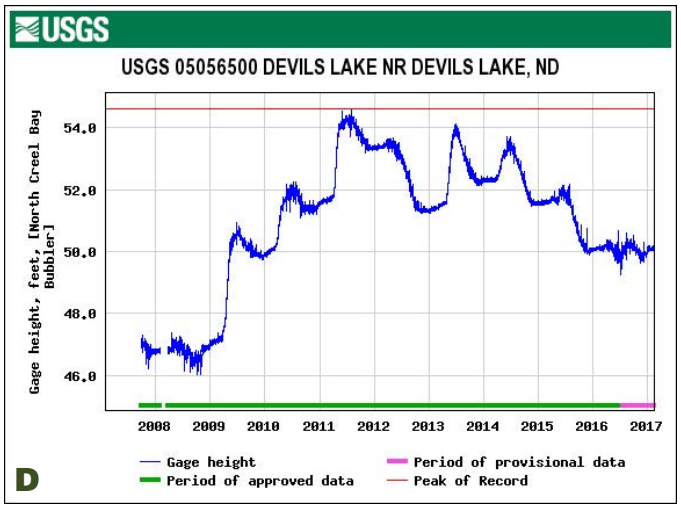
- Drier, warmer spring and warmer summer: During the 2016 growing season, North Dakota received near-normal rainfall except in the drier-than-normal counties in the west. Rainfall in May was spotty and associated with severe storms, and June was very dry. Most of the state received slightly above-normal precipitation during July and August. A warmer and drier 2016 spring led to fewer reports of the leaf diseases dependent on cyclical infection.
- Warmer spring and fall: Stigmina needlecast (*Stigmina lautii*) spores are present when daily highs are above 50 F (Walla), historically from mid-May to mid-October. The warmer temperatures began in April 2015 and March 2016 and extended to mid-November both years. Stigmina infections may be possible during these extended warm periods.
- Devils Lake: After rising water levels between 1993 and 2011 killed 8,225 acres of trees, lake levels remained steady through 2016 because inflows balanced discharges on the east and west ends of the lake.
- Storm events: During the 2016 growing season, 271 hail events and 32 tornadoes were reported across the state. Storm-damaged trees are susceptible to invasion by decay fungi and canker-causing pathogens, and suffer stress from crown loss. Damaged and downed trees and limbs are brood sites for wood-boring beetles, including Dutch elm disease vectors.

Figure 1: (A) Percent of normal rainfall for May 2016; (B) Percent of normal rainfall for June 2016; (C) Percent normal rainfall for the 2016 growing season; (D) Devils Lake level 2008-2016.









Forest Health Issues of Concern

- An overabundance of green ash in light of the potential introduction of EAB threatens the sustainability of riparian forest areas, conservation tree plantings and municipal forests.
- An overmaturity of aspen stands, accompanied by increasingly severe forest health issues, threatens the sustainability of aspen forests in the absence of stand-replacing disturbance.
- The practice of planting trees several inches too deeply results in poor tree performance, tree health issues, and early mortality in municipal and conservation tree plantings.

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Other Forest Health Issues

- The most commonly encountered disease agents: Stigmina and occasionally Rhizosphaera (*Rhizosphaera kalkhoffii*) needlecasts of spruce, Valsa (formerly cytospora, *Valsa kunzei*) canker of spruce, ash heart rot (*Perenniporia fraxinophila*) and Dutch elm disease (*Ophiostoma ulmi* and *O. novo-ulmi*)
- The most commonly encountered insect agents: forest tent caterpillar (*Malacosoma disstria*), aphids and scales and ips (*Ips spp.*) beetles primarily in stressed ponderosa pine windbreaks
- The most common abiotic agents and associated problems: herbicide exposure via drift and misapplication; effects of flooding events during past growing seasons, especially in the Missouri and Souris River basins in central and north-central North Dakota; and the effects of planting municipal and conservation trees too deeply
- Western areas of North Dakota continuing to deal with the severe impacts of the first wave of Dutch elm disease in American elm. This has a negative impact on riparian, conservation and municipal tree resources.
- Forest tent caterpillar and large aspen tortrix (*Choristoneura conflictana*) continuing to maintain populations in aspen resources. Other defoliators such as fall webworm (*Hyphantria cunea*) and yellow-headed spruce sawfly (*Pikonema alaskensis*) continue to have a negative impact on the effectiveness of windbreak and other conservation plantings.
- From April through December 2016, Dakota Access Pipeline protestors southwest of Mandan importing large volumes of untreated firewood from other states, including semi-truck loads of firewood from EAB-quarantined areas. The NDDA is working with one of the protest sites on disposal of this material and plans additional invasive borer trapping.

Education and Outreach for Invasive Tree and Forest Insects of Concern

- EAB Awareness Week was coordinated by the North Dakota Forest Service (NDFS) Forest Health and Community Forestry programs and the North Dakota Department of Agriculture. Twenty-five communities across the state participated in activities that identified vulnerable trees and highlighted their values to the community, encouraged campers not to move firewood and encouraged EAB readiness planning. Communities received posters and a short PowerPoint presentation designed to increase EAB awareness. EAB has not been found in North Dakota.
- The NDFS maintains a webpage titled “ND Invasives” with information on potential invasive pests and links to further information.
- The NDFS supported the NDDA in news releases on firewood brought into the state from EAB-quarantined areas.

For more information, please contact North Dakota Forest Service forest health manager Lezlee Johnson at lezlee.johnson@ndsu.edu or visit the agency website at www.ag.ndsu.edu/ndfs.

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