



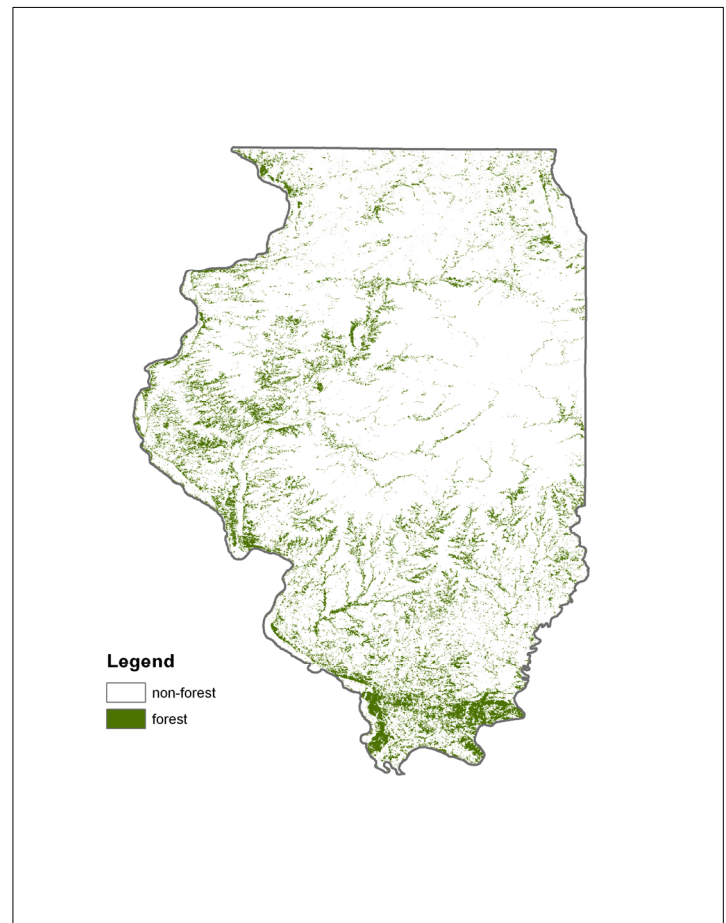
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## I. Illinois' Forest Resources

Illinois forests have many recreation and wildlife benefits. In addition, over 32,000 people are employed in primary and secondary wood processing and manufacturing. The net volume of growing stock has increased by 40 percent since 1962, a reversal of the trend from 1948 to 1962. The volume of elms has continued to decrease due to Dutch elm disease, but red and white oaks, along with black walnut, have increased by 38 to 54 percent since 1962.

The area of forest land in Illinois is approximately 5.3 million acres and represents 15% of the total land area of the state. Illinois' forests are predominately hardwoods, with 90% of the total timberland area classified as hardwood forest types (Figure 2). The primary hardwood forest types in the state are oak-hickory, at 65% of all timberland, elm-ash-cottonwood at 23%, and maple-beech which covers 2% of Illinois' timberland.



**Figure 1. Illinois Forest Areas**

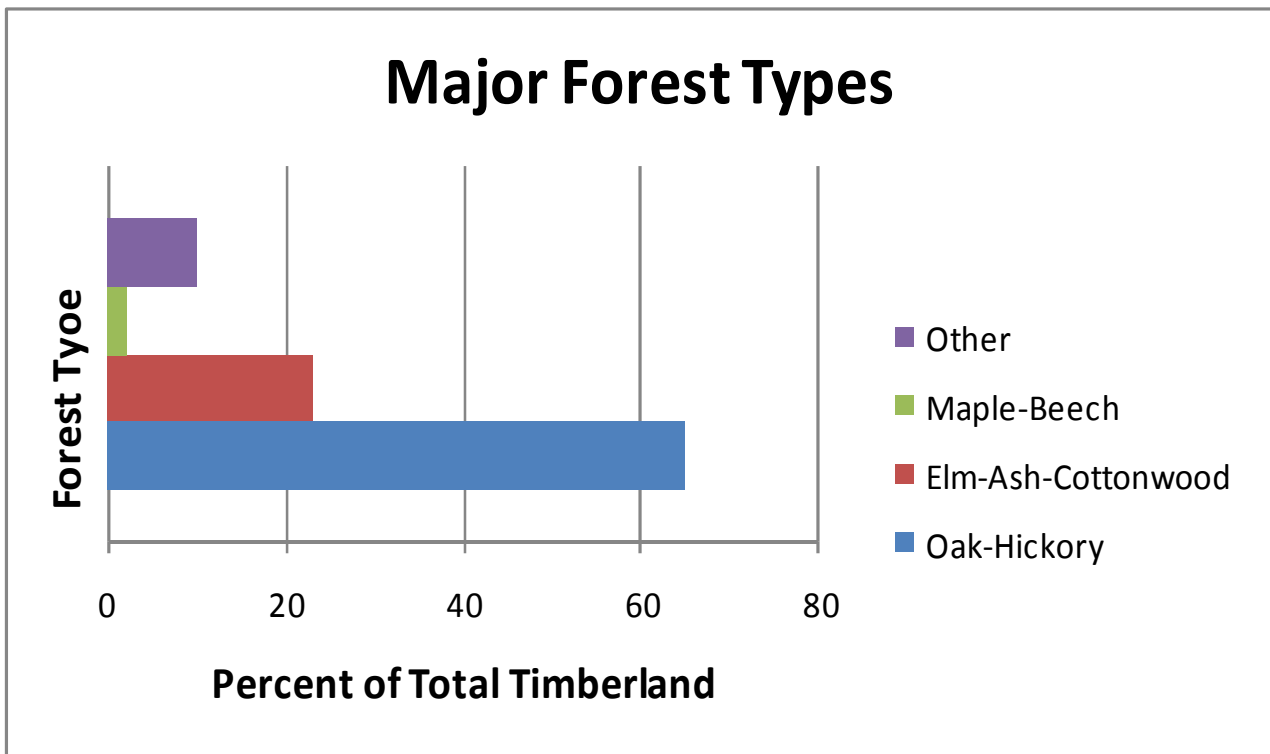


Figure 2. Major forest types by percent of total timberland. Source: Illinois' Forest 2005, NRS-29.

## II. Exotic Pests

### EMERALD ASH BORER (EAB) TRAP TREE MONITORING PROGRAM

With the recent (2006) find of emerald ash borer (EAB) in northeastern Illinois and subsequent finds throughout the greater Chicago metropolitan area, and as far south as Bloomington/Chenoa, Illinois area, prudence strongly suggests that EAB monitoring is needed for the extensive ash containing forested areas associated with Illinois state parks, U.S. Army Corps of Engineers (USACE) lands, and the Shawnee National Forest (SNF).

Beginning in early July, 2008 trap trees were established at USACE lands at Carlyle, Renwick, and Shelbyville Lakes, Hazlet, Murphysboro, and Giant City state parks, and at the Garden of the Gods and Lake Glendale recreational use areas in the SNF. EAB trap trees were established using the USFS EAB trap tree guidelines. Where possible, trees in full sun were selected and at or near sites where EAB would most likely appear (i.e. campgrounds due to importation of firewood). In addition, we made every effort to select smaller trees (<5 inch DBH) to minimize the potential for hazard/liability and aesthetics, and to facilitate subsequent removal, peeling, and handling. A total of 133 trap trees were established at the above sites. Refer to **Table 1** for a summary of trap tree locations, species composition, size class, and overall tree condition.

Due to the rather late start of selecting and establishing the above trap trees, we elected to leave all of the trap trees in place until fall, 2009 at which time half were removed, peeled, and examined for evidence of EAB life stages and galleries. **No evidence of EAB was found in these selected trees.**

**Table 1. Summary of EAB trap trees on USCAE lands, selected Illinois State Parks, and the Shawnee National Forest (SNF) (2008-2009).**

LOCATION	# TREES	SPECIES	DBH	CONDITION
<b><i>U.S. ARMY CORPS OF ENGINEERS LAND</i></b>				
Lake Shelbyville	70	31% white ash 69% green ash	<5 inches	No dieback
Lake Caryle	17	100% green ash	<5 inches	24% with dieback
Lake Rend	18	22% white ash	<5 inches	11% with dieback
<b><i>ILLINOIS STATE PARKS</i></b>				
Hazlet S.P.	4	100% green ash	<5 inches	No dieback
Murphysboro S.P.	2	100% green ash	<5 inches	No dieback
Giant City S.P.	8	25% white ash	<5 inches	No dieback
<b><i>SHAWNEE NATIONAL FOREST</i></b>				
Garden of Gods	6	100% green	<5 inches	No dieback
Lake Glendale	8	87% white ash 13% green ash	<5 inches	No dieback

**Please note:** *Approximately 50% of these trees were removed in 2009, peeled and examined for evidence of EAB galleries and life stages. As reported above, no evidence of EAB was found in any of the trap trees.*

### **EAB-COOK COUNTY FOREST PRESERVE DISTRICT MONITORING PROGRAM**

In early 2008, the dreaded emerald ash borer (EAB) was discovered in a number of forest preserve sites within the Cook County Illinois Forest Preserve District (CCFPD) land holdings. A summary of EAB positive sites is listed below (**Table 2**). At the request of the CCFPD foresters, a cooperative agreement was established to assist them in delimiting and monitoring EAB finds. During summer, 2009, all confirmed EAB infestation sites were delimited and a visual ash density survey was conducted. At each site at least two trained observers walked the immediate area around a given find and visually inspected host ash trees for evidence of EAB. The points were recorded on CCFPD maps for future reference. In addition, where possible, the specific forest preserve area was inventoried to ascertain relative ash tree density. Transects were run and the relative percentage of ash species were visually estimated. These values were then plotted on a field map and used to generate a relative ash density map (**Figure 3**).

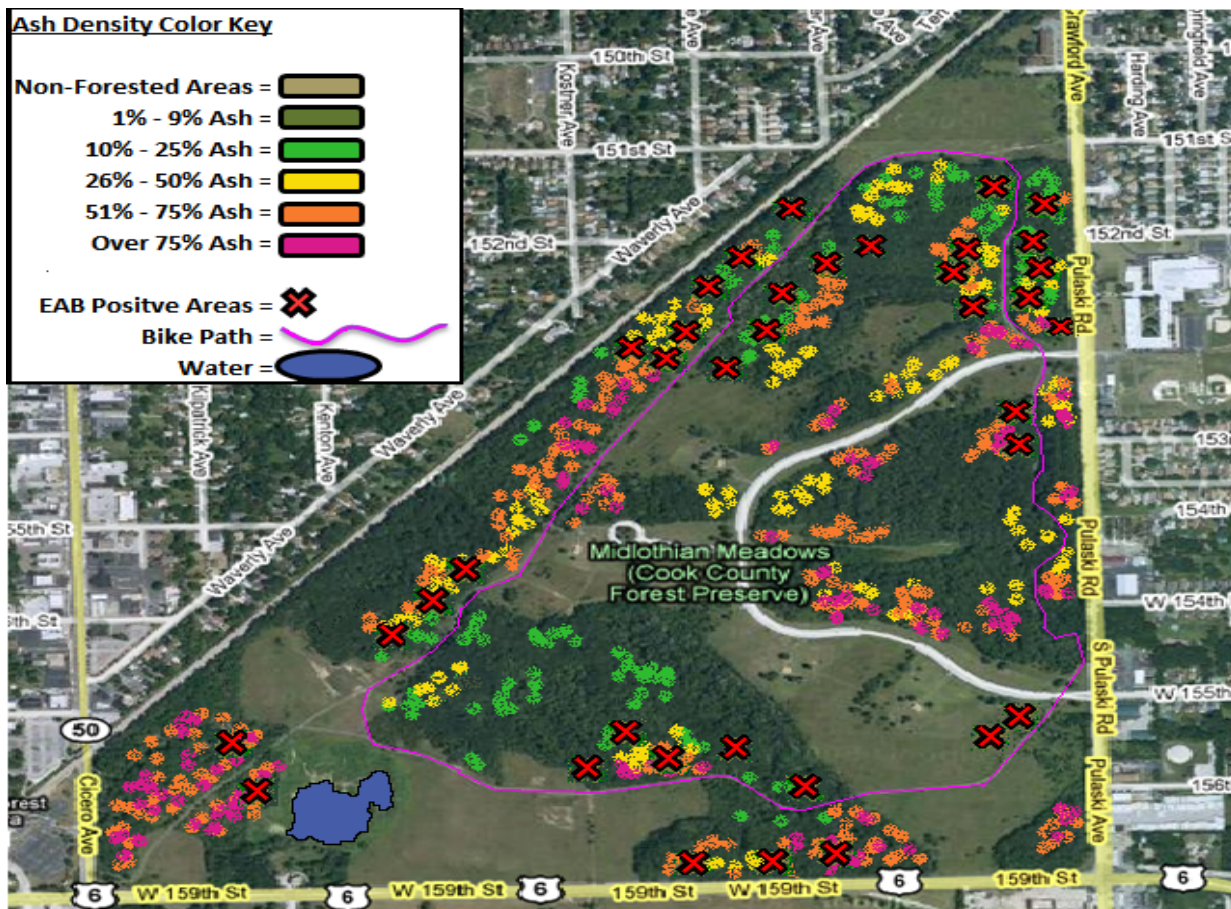
Information from the delimiting and ash density field survey will be used in the future to monitor and hopefully predict the spread and severity of EAB infestations in these give locales. It is anticipated

that in 2010, additional areas of the CCFPD will be delimited and inventoried as new EAB finds are confirmed.

Future plans include expanding the above program to include initiation of a form of the Slow Ash Mortality (SLAM) program in cooperation with the USDA-FS and a cooperative project with researchers at Michigan State University on the long term effects of EAB caused ash mortality and the succession of woody plant and invasive species in forest preserve adjoining urban areas. Details are pending on both of the above projects.

**Table 2. Listing of positive CCFPD EAB sites delimited and surveyed (summer, 2009)**

SITE	CCFPD REGION
Chippewa Woods	3
Schiller Park Woods	3
Chick Evans Golf Course	4
Harms Woods	4
26 <sup>th</sup> Street Woods	5
Zoo Woods (Brookfield Zoo)	5
Midlothian Meadows	8
George Dunn National Golf Course	8
Kickapoo Woods	9



**Figure 3. Ash Density Map**



### **EDRR EXOTIC BARK BEETLE TRAPPING PROGRAM**

In cooperation with the USDA-FS, a cooperative EDRR bark beetle trapping program was initiated in May, 2009. Twelve (12) trapping sites consisting of three different pheromone traps were positioned around the state of Illinois with ten (10) traps situated in the northeastern Illinois (Lake, McHenry, Cook, DuPage, Kane, and Kankakee counties), the Quad Cities area (Henry county), and the Bellville area (St. Clair county). The traps were in place by mid May and samples collected every two weeks until late October, 2009. The samples were shipped to a bark beetle taxonomist at Michigan State University for positive identification. **No evidence of exotic bark beetles were discovered from the samples submitted to MSU for identification.** It is anticipated that the trapping program will be conducted again in 2010 with additional trapping sites added to the program.

**EUROPEAN OAK BORER:** This new exotic has recently been reported in Michigan and is native to Europe. It has been in the U.S. (i.e. New York) and Canada for a number of years, but is showing up closer to the Midwest. It is considered a secondary pest attacking stressed oak trees. With the recent and consistent pattern of floods and droughts, this insect could become more of a pest particularly in urban areas where most tree species are already growing in less than optimum conditions. **This pest will also be added to our “watch list” for 2010.**

**JAPANESE BEETLE (JB):** The Japanese beetle (JB) is a well known and established exotic invasive pest affecting over 300 different herbaceous and woody plant species including soybeans. Based on visual surveys conducted throughout Illinois, JB populations were spotty and appeared lower compared to 2008. Both rural and urban areas of central, southern, and northeastern Illinois that were hard hit in 2008 had varying levels of defoliation. Some plants had extensive defoliation while other nearby plants showed very little plant damage. As in 2008, JB defoliation was very evident on lindens, roses, wild and domestic grape, hawthorn, maples, and birch just to name a few. Defoliation at these sites ranged from 20 to 60% of the plant canopies

## **III. Plant Diseases**

**THOUSAND CANKERS OF WALNUT:** This particular pathogen has been monitored in Missouri for the past few years. This disease involves an insect vector (bark beetle) and has the potential to cause wide spread death of walnuts. Walnut is a highly valued tree species for its veneer and nuts. This disease/insect combo has the potential to cause major economic damage where ever walnuts are grown. To the best of our knowledge, there have been no reports of this disease in Illinois. **A vigilant watch will be in place in 2010 for this devastating disease.**

**DUTCH ELM DISEASE (DED):** This vascular wilt disease has been in with us for decades and continues to kill American elms throughout Illinois. Based on reports provided by the University of Illinois Plant Clinic (UIPC), DED continues to be a problem, but 2009 was consistent with previous years (3).

**OAK WILT (OW):** The dreaded oak wilt continues to spread in Illinois and has become both an urban and forest disease. Results reported by the UIPC indicated that there was major increase in positive oak wilt samples for 2009 (1,3)

**VERTICILLIUM WILT (VW):** This very ubiquitous and opportunistic vascular wilt fungus was very prevalent due to the very wet 2008. Trees stressed from the 2005, 2007, 2008 and 2009 droughts and the 2008 flooding are particularly susceptible to VW. Positive isolations of VW were found in sugar maple, red maple, ash, smoketree, Japanese maple, and three-flowered maple. Counties with positive VW isolations included Champaign, Douglas, DeKalb, DuPage, Ford, Hamilton, Lake, Peoria, and Winnebago (3).

**BACTERIAL LEAF SCORCH (BLS):** Bacterial leaf scorch resembles abiotic scorch, but is caused by a bacterium, *Xylella fastidiosa*. It is thought to be spread by leafhoppers and spittlebugs. Tree hosts include elm, hackberry, maple, mulberry, oak, sweetgum, sycamore, and planetree. Since 1999, the UIPC records show that BLS has tested positive in 10 Illinois counties stretching from Jefferson, Madison, and St. Clair counties in southern Illinois through parts of central Illinois (i.e. Sangamon, Champaign, Douglas-Moultrie, Iroquois) north to Cook and DuPage counties and to far JoDaviess county in extreme north-west Illinois (3). With the exception of Champaign county with 40 positive samples, the remaining 9 counties have had 1-3 positive cases confirmed (3). In terms of hosts, BLS has been found in bur, northern red, pin, white, swamp white, and shingle oaks from 1999-2008.

In 2009, 12 samples were submitted by Ms. Stephanie Adams, Morton Arboretum plant pathologist, to Dr. Gerry Adams at Michigan State University for diagnosis. All 12 samples came back negative for BLS (personal communication by S. Adams).

**ANTHRACNOSE DISEASES:** Virtually all of Illinois had a very wet and cool spring. This provided an ideal environment for many common fungal leaf diseases including apple scab and anthracnose. Apple scab was extremely common and heavy on common apple species and crabapple varieties. Many of the older variety crabapples were completely defoliated by mid summer. Commonly, sycamores were very slow to leaf out. Most sycamores did not have a full canopy until late June or early July. While not life-threatening, these diseases can reduce the photosynthetic capacity of trees leading to a reduction in food production, promote premature leaf drop, and pre-dispose trees to secondary agents mentioned above. (3)

**NEEDLE CAST DISEASES:** Two very common diseases affecting conifers, *Rhizosphaera* needle cast and *Diplodia* were prevalent in 2009. Both of these fungal leaf diseases attack the needles of cone-bearing tree species causing premature needle cast or a browning and/or death of the growing tip, respectively. While not outright fatal, they stress the tree as pointed out above and reduce overall ornamental qualities and growth rates of affected trees. Coupled with regular drought conditions, as mentioned previously, a deadly combination may result. (1,3)

**STRESS-RELATED CANKER DISEASES:** *Cytospora* canker of spruce is definitely a stress related disease particularly of Colorado blue spruce. Spruces are a common urban forest and landscape species. The cankers are initially found on the undersides of the branches and result from some type of stress. Spruce trees growing in urban environments are very prone to this canker. While not fatal, the cankers cause branches to die distal to the canker resulting in a loss of ornamental quality and landscape function. (1,3)

## IV. Insect Pests

**BAGWORM (BW):** For approximately the last decade, bagworm has continued to increase in severity and range in northern Illinois. Prior to the late 1990's, bagworm populations were very spotty and sporadic particularly north of I-80 with a few infestations in the City of Chicago. With the onset of milder winters, bagworm populations have been increasing throughout northern Illinois especially in many of the urban forests of the western and northwestern suburbs. Short term droughts in 2005, 2007, and the aforementioned dry spell of 2008 have all exacerbated defoliation by the bagworm. Major species affected include Colorado blue spruce, common arborvitae, honeylocust, linden, hackberry, and bald cypress. For the past several years heavy to severe defoliation (50-75% of tree canopy) has been observed on the aforementioned species with honeylocust suffering the highest rate of mid to late summer defoliation. However, in summer of 2009, bagworm populations and subsequent defoliation dropped dramatically particularly in the suburbs of northeastern Illinois. Trees that had been heavily defoliated in 2008, experienced very little if any defoliation in 2009.

A very preliminary research study is currently being conducted to determine the effect of overwintering cold conditions on the survivability of bagworm eggs. Initial lab studies have shown that bagworm eggs have the capacity to supercool to the mid -20°F. Field studies are also being conducted from 2006-present by periodically sampling bagworms from the field, subjecting them to defined periods (weeks) of prolonged cold in a freezer, and then allowing them to hatch in order to assess the effect of ambient winter temperatures on overwintering egg survival. Research by Miller and Hart (1987) and others found that the degree of cold and the duration are two major factors that effect the overwintering survival of insects in temperate climates.

Recently (2006-2008), the winters for the past several years have not been severe enough to have a major impact on overwintering bagworm egg survival.

However, for the 2009 winter, several prolonged cold spell occurred in January and February, 2009 that may have had an impact on overwintering bagworm eggs. Further studies are being conducted for the 2010 winter to better identify the lethal supercooling point, production of cryoprotectants, and to quantify the effect of prolonged/cumulative cold temperatures on egg survival.

**FALL WEBWORM (FW):** Fall webworm is a very common pest throughout the Midwest and mid-south. In the more southern realms there are two generations. In northern Illinois, only one generation of FWW occurs. Visual field surveys throughout the state for FWW webs and larvae revealed typical (low to moderate) levels of FWW. Population levels increased gradually from northern to southern Illinois consistent with the bivoltine nature of the insect farther south. As with JB, FWW feeds on hundreds of different tree species and was found on a multitude of hosts including, but not limited to persimmon, black walnut, crabapple and common apple, maple, linden, and ash. No obvious tree decline or mortality was observed on forest trees species, however, trees growing in the central and southern portions of Illinois may be more prone to stress due to FWW feeding throughout the season. Trees growing in northern Illinois usually do not suffer as much from late season FWW defoliation since the trees are approaching senescence. Usually aesthetic issues associated with the webs are more common.

**BARK BEETLES (BB) and WOOD-BORERS (WB):** Bark beetles attack primarily stressed trees including both hardwoods and conifers. Prolonged drought or a variety of abiotic and biotic stresses may pre-dispose trees to bark beetle attacks.

Based on field observations and in conversations with green industry members and foresters, 2009 appeared to a “normal year” for bark beetle activity. No major bark beetle outbreaks were observed or reported for 2008.

Preliminary results from a research study on associates of the emerald ash borer (EAB) is revealing that the ash bark beetle and the ash privet borer are very common in declining ash trees being removed due to EAB and/or poor condition. Both of these insects are considered secondary agents coming in on stressed trees. This is not surprising as large portions of Illinois experienced droughts in portions of 2005, 2007, 2008, and 2009. Many of these trees are just now beginning to show the effects of these abiotic events.

In addition, engraver beetles and the Zimmerman pine moth continue to be chronic problems for many of our common urban forest conifer species particularly Scots, Austrian pine, and mugho pines. As above, both of these insect pests tend to attack stressed conifers growing on poor sites (poor drainage) along with drought stress, soil compaction, construction damage, etc.

## V. Weather/Abiotic Related Damage

*ABIOTIC FACTORS* by *Mari Castello*, FHP field technician and Fredric Miller.

### **ICE STORMS (January, 2009)**

A severe ice storm downed trees and electrical lines in late January, 2009. A federal disaster area was declared in Alexander, Gallatin, Hardin, Johnson, Massac, Pope, Pulaski, Saline, and Union counties. The long term effects of this winter storm on forest health is yet to be seen.

### **WIND DAMAGE (Spring, 2009)**

As if the January, 2009 ice storm was not enough, a widespread damaging wind event with isolated embedded tornadoes occurred on 8 May 2009 affecting Jackson, Williamson, Franklin, and Saline counties in southern Illinois. Down power lines and snapped trees produced much damage.

Between these two major storm events, many recreational areas were closed for a period of time due to severe damage and clean up efforts. Many trees exhibited breakage of major upper and scaffold branches increases the potential for tree hazard and failure, particularly in populated areas. The decline of these trees may prove to increase outbreaks of insect pests and diseases in the future.

The state set two records that may have an effect on forest health. July, 2009 was the coldest July on record for Illinois. October, 2009 was the second wettest October on record. Flooding occurred in many areas of the state especially in lowlands and bottomlands.

### **FLOODING (May-June, 2009)**

One of the earliest abiotic events to occur in various parts of Illinois, including areas contiguous to the Mississippi River in western and southwestern Illinois, and portions of southeastern Illinois, was the early summer (May-June) flooding.

Portions of the Quad Cities were once again flooded including downtown Davenport, Iowa scene of the infamous 1993 Mississippi River flood event. Communities farther south adjoining the Mississippi River also flooded including portions of St. Louis, Missouri.



In the Chicago metro area, the Des Plaines River drainage experienced flooding affecting the urban forests and wooded areas of the Cook County Forest Preserve District. Twice more, these same areas were flooded or threatened with flooding in mid September, 2008 with heavy rains and again in late December, 2008 when warm temperatures (50°F) and heavy rains facilitated a rapid snow melt of nearly 12 inches along with one to three inch rain events in just several days.

Additional areas of northern Illinois experienced a short term flood event in mid September, 2008 including the Rock, Fox, and Des Plaines River drainages.

Moving south, in southeastern Illinois, areas of the Wabash River watershed approximately east of I-57 and between I-70 to the north and I-64 to the south went out of their banks in early June, 2008 flooding low-lying areas.

Visual surveys of all of the above areas during July-September, 2008 did not reveal any obvious or extensive tree mortality. Tree survival was consistent with previous studies on short term flood events. Most of the tree species in these areas were bottomland species and were adapted to periodic flooding. Based on my own personal experience and field research associated with the 1993 Mississippi River flood event, certain woody plant species will begin showing dieback and mortality symptoms within just a few weeks of the inundation (i.e. evergreens, flowering fruit trees, lindens, sugar maples and some oaks). Flood tolerant species may not show stress or decline symptoms for a number of years after flooding. In addition, my research and others have shown that the time of the year, duration of the flood, and current flow rate also are major variables affecting potential woody plant decline and mortality. Adding to the flooding stress component, many parts of northern Illinois experienced dry to droughty conditions from approximately mid July through early September, 2008 prior to the very intense heavy rainfall event in mid September, 2008. Follow up surveys will be needed in all of these areas in 2009 to determine the long term effects of the 2008 flood and drought events.

## VI. Invasive Plant Species

Exotic plants having significant influence on Illinois forests include:

Garlic Mustard (*Alliaria petiolata*) a problem in the Northern half of the state with indications that it is continuing South.

Black Locust (*Robinia pseudoacacia*), populations are found state wide.

Bush Honeysuckle (*Lonicera spp*), common invader throughout the state.

Buckthorn (*Rhamnus spp*), common in the Northern portion of the state.

Kudzu (*Pueraria Montana*), occasional spots, primarily in the Southern one third of the state.

Oriental Bittersweet (*Celastrus orbiculatus*), common in Northeastern and Southern portions of the state.

Tree of Heaven (*Ailanthus altissima*), common throughout most of the state.

Russian Olive (*Elaeagnus angustifolia*), common in the Southern two thirds of the state.

Japanese Hops (*Humulus japonicas*), common in the Northern two thirds of the state.

## VII. References

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3. Pataky, N. 2008. Woody Plant Disease Update for 2008. University of Illinois Plant Clinic (UIPC). Urbana, Illinois.