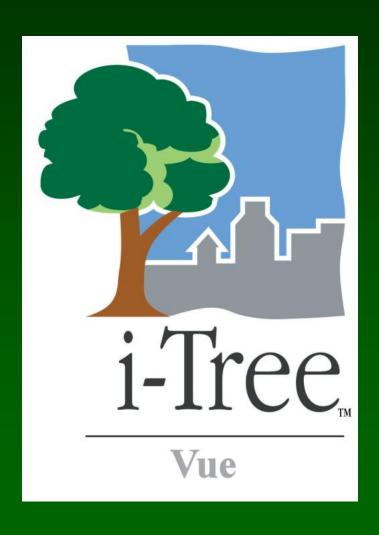# i-Tree Vue
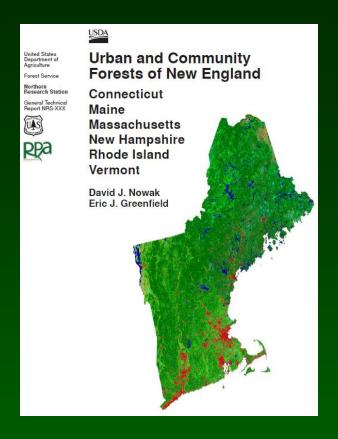
What does i-Tree Vue do?

- Gateway tool for further canopy exploration

- Utilizes existing national land cover data (NLCD) maps for analysis

- Analyzes canopy cover and estimates ecosystem services

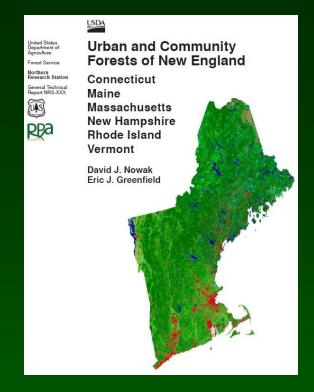- Illustrates effects of future planting or canopy loss scenarios

NLCD Data
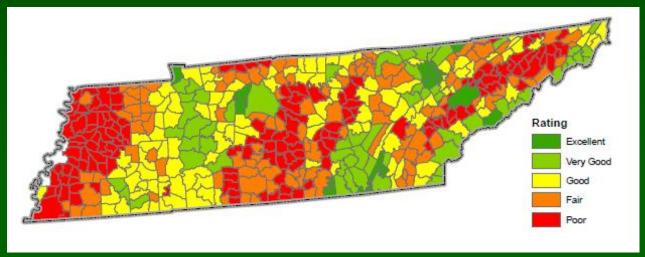
- **Free - www.mrlc.gov**
- **30 meter resolution**
  - **Land cover**
  - **Tree cover**
  - **Impervious cover**

- **State reports & GIS files available**
  - **Data at community, county sub-division and county level - http://nrs.fs.fed.us/data/urban/**

USDA

United States Department of Agriculture

Forest Service

Northern Research Station

General Technical Report NRS-XXX

RPA

Urban and Community Forests of New England

**Connecticut
Maine
Massachusetts
New Hampshire
Rhode Island
Vermont**

David J. Nowak
Eric J. Greenfield

NLCD Data

NLCD

- **<u>Advantages</u>:**
  - **Free, wall-to-wall coverage of lower 48 states**
  - **maps of canopy cover distribution**
  - **can integrate with GIS**
- **<u>Disadvantages</u>**
  - **relatively course resolution**
  - **tends to underestimate tree cover**
  - **designed for regional analyses**
  - **2001 imagery**
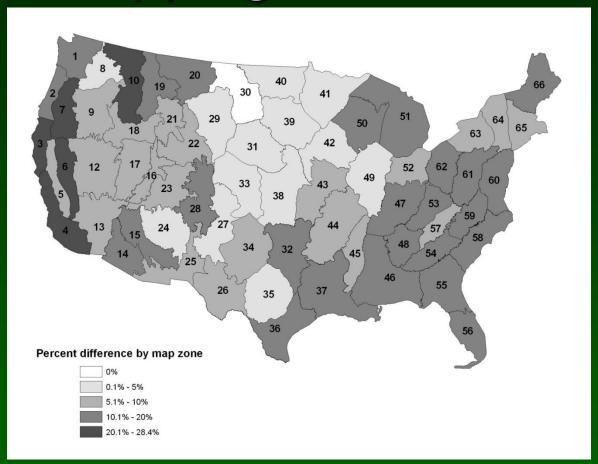
Testing NLCD Tree and Impervious Cover Maps

100%

0%

NLCD Mapping Zones

Tree cover:
National underestimation = 9.7%
Maximum underestimation = 28.4%
Underestimation in 64 of 65 zones

Impervious cover:
National underestimation = 1.4%
Maximum underestimation = 5.7%
Underestimation in 44 of 65 zones

NLCD images online

www.MRLC.gov

Zoom in on area of interest

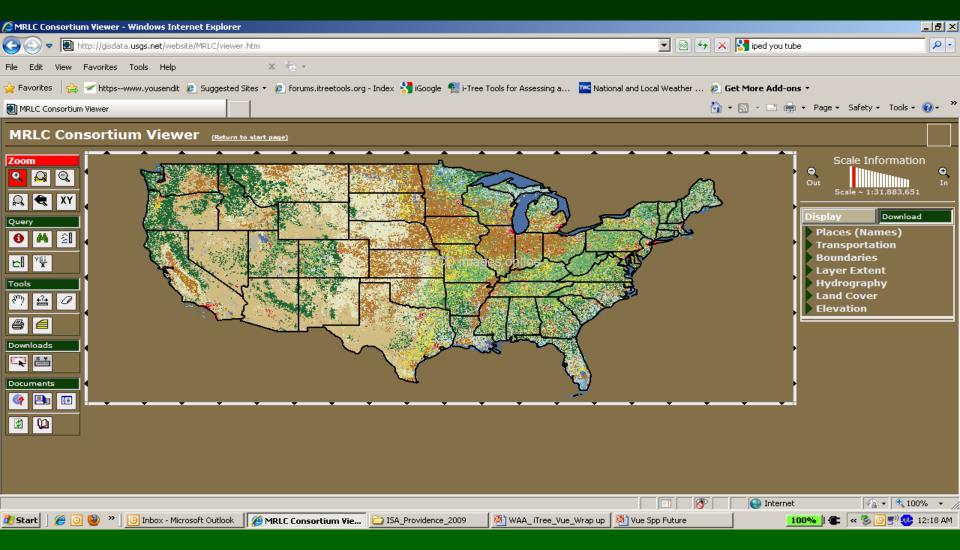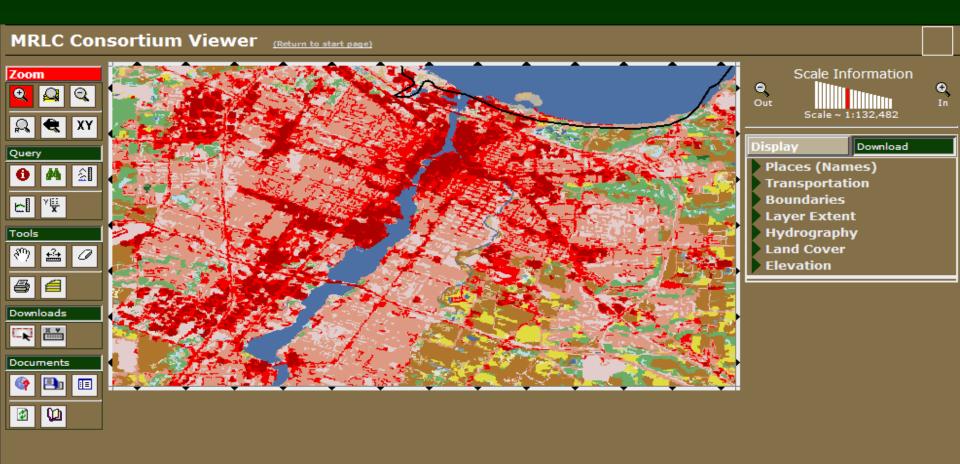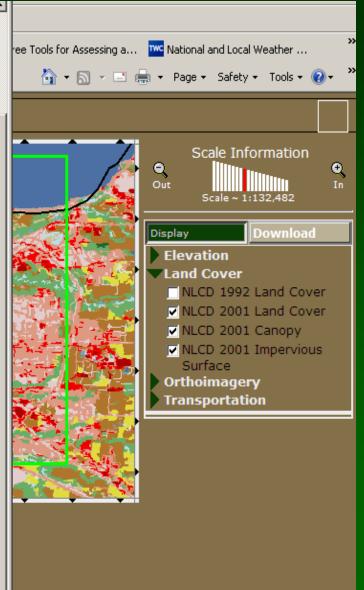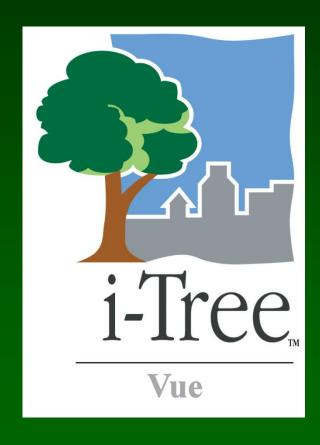# Download (3) NLCD Image files

Launch Vue

Load NLCD

NLCD Statistics

NLCD Image Area:
140,234.2 acres

General

Tree Canopy (TC):
27,644.1 acres

Dev

i-Tree Vue (beta)

NLCD Land Cover

NLCD Statistics

NLCD Image Area:

Legend

11	Open Water
21	Dev. Open
22	Dev. Low
23	Dev. Med
24	Dev. High
31	Barren
41	For. Deciduous
42	For. Evergreen
43	For. Mixed
52	Shrub / Scrub
71	Grassland
81	Pasture
82	Crops
90	Wet. Woody
95	Wet. Herbaceous

C:\Program Files\i-Tree\VUE\SAMPLE_WashingtonDC\LandCover_DC.tif

NLCD Percent Urban Impervious Cover

Legend

Max: 100

High

Pct

Low

Min: 0

Carbon Storage
Carbon Sequestration
CO Pollution Removal
NO2 Pollution Removal
O3 Pollution Removal
SO2 Pollution Removal
PM10 Pollution Removal
Tree Available Growing Space
Tree Canopy Stocking
Tree Canopy %Change: Region
Tree Canopy %Change: Developed, All
Tree Canopy %Change: Developed Classes
Tree Canopy %Change: General Classes

Carbon Storage

C:\Program Files\i-Tree\VUE\SAMPLE_WashingtonDC\ImperviousCover_DC.tif

TC: 47.7%   IC: 0%

Zoom %

34.3 Full Extent Scroll Bars On Legends Off

Metric Units

Agriculture (all):

Pixel

Analysis Options

put Reset Output

Desktop Interface

Carbon Storage

Entire region.
*(Carbon Storage * Tree Canopy)*   note: all estimates are rounded
   Date: 5/19/2010 7:37:36 PM
_____

⊟ **Image Area**
140,234.2 acres

⊟ **Impervious Cover**
44,970.5 acres
33.4 %

⊟ **Tree Canopy**
27,644.1 acres
20.5 %
   Carbon Storage: 1,122,189.6 short tons; $23,211,159.3 @ $20.68 per short ton
      CO_2 Equivalent Storage: 4,113,947.2 short tons; $23,211,159.3 @ $5.64 per short ton

⊟ **NLCD Developed**
⊟ **Developed, All**
   107,045.8 acres
   76.3 %
   Impervious Cover: 44970.5 acres; or 42 %
   Tree Canopy: 11231.5 acres; or 10.5 %
    Carbon Storage: 455,933.6 short tons; $9,430,444.1 @ $20.68 per short ton
       CO_2 Equivalent Storage: 1,671,452.4 short tons; $9,430,444.1 @ $5.64 per short ton
   ⊞ **Developed, Open Space**
   ⊞ **Developed, Low Intensity**
   ⊞ **Developed, Medium Intensity**
   ⊞ **Developed, High Intensity**

⊟ **NLCD Forest**
⊟ **Forest, All**
   20,131.0 acres
   14.4 %
   Impervious Cover: 0 acres; or 0 %
   Tree Canopy: 15412 acres; or 76.6 %
    Carbon Storage: 625,636.3 short tons; $12,940,544.4 @ $20.68 per short ton
       CO_2 Equivalent Storage: 2,293,582.8 short tons; $12,940,544.4 @ $5.64 per short ton
   ⊞ **Deciduous**
   ⊞ **Evergreen**
   ⊞ **Mixed**
   ⊞ **Shrub/Scrub**

⊟ **NLCD Wetlands**

i-Tree
Vue

Map Output: Carbon

Legend

Max: 9

High

short
tons

Low

Min: 0

Carbon Storage: Output

Misc
Pixel Info
Classes
About

Expand All | Save | Print | Close

e Vue (beta)

7:38 PM

⊟ Impervious Cover

44,970.5 acres

33.4 %

⊟ Existing Tree Canopy

27,644.1 acres

20.5 %

Carbon Storage: 1,122,189.6 short tons; $23,211,159.3 @ $20.68 per short ton

CO2 Equivalent Storage: 4,113,947.2 short tons; $23,211,159.3 @ $5.64 per short ton

Carbon Sequestration: 36,995.3 short tons; $765,203.0 @ $20.68 per short ton

CO2 Equivalent Sequestration: 135,624.6 short tons; $765,203.0 @ $5.64 per short ton

Pollution Removal - CO: 34.4 short tons; $43,928.3 @ $1276.41 per short ton

Pollution Removal - NO2: 204.0 short tons; $1,833,568.5 @ $8986.57 per short ton

Pollution Removal - O3: 456.2 short tons; $4,099,468.8 @ $8986.57 per short ton

Pollution Removal - SO2: 165.2 short tons; $363,464.7 @ $2199.92 per short ton

Pollution Removal - PM10: 281.5 short tons; $1,688,780.4 @ $6000.12 per short ton

⊟ New User-Defined Tree Canopy

37,031.6 acres

Difference: 9,387.5 acres

27.5 %

Difference: 7 %

Carbon Storage: 1,503,267.1 short tons; $31,093,294.4 @ $20.68 per short ton

Difference: 381,077.5 short tons; $7,882,135

CO2 Equivalent Storage: 5,510,977.2 short tons; $31,093,294.4 @ $5.64 per short ton

Difference: 1,397,030.1 short tons; $7,882,135

Carbon Sequestration: 49,558.3 short tons; $1,025,053.6 @ $20.68 per short ton

Difference: 12,563.0 short tons; $259,851

CO2 Equivalent Sequestration: 181,680.6 short tons; $1,025,053.6 @ $5.64 per short ton

Difference: 46,055.9 short tons; $259,851

Pollution Removal - CO: 46.1 short tons; $58,845.7 @ $1276.41 per short ton

Difference: 11.7 short tons; $14,917

Pollution Removal - NO2: 273.3 short tons; $2,456,218.8 @ $8986.57 per short ton

Difference: 69.3 short tons; $622,650

Calculate New Percent Tree Canopy - Entire Region

Entire Region

Existing Tree Canopy: 23.2 %
Total Available space: 49 % and Maximum Possible Tree Canopy: 72.2%

Enter a NEW desired Tree Canopy percentage for the entire region: `50`

Carbon Storage `81188.3` *CO_2: 297636.31*   Carbon Sequestration `2676.53` *CO_2: 9812.19*

CO `0.99184`   NO2 `12.2119`   O3 `29.1784`   SO2 `6.16115`   PM10 `21.3281`

Units: pounds per acre of canopy (OH)

Carbon Storage ☑

Carbon Sequestration ☑

Carbon Monoxide (CO) ☑

Nitrogen Dioxide (NO2) ☑

Ozone (O3) ☑

Sulfur Dioxide (SO2) ☑

Particulate Matter (PM10) ☑

Clear All ☑

Carbon and Pollution Monetary Values - $ / US ton

Carbon Storage $ `20.6838` *CO_2: 5.64*   Carbon Sequestration $ `20.6838` *CO_2: 5.64*

CO $ `1276.40`   NO2 $ `8986.57`   O3 $ `8986.57`   SO2 $ `2199.92`   PM10 $ `6000.11`

[Reset]   [Cancel]   [OK]

i-Tree Vue (beta)

i-Tree Vue - Analysis Report

New User-Defined Tree Canopy

Percent change across the entire region.

(User request: 50 %; a difference of 26.8 %) note: all estimates are rounded

Date: 6/24/2009 9:26:01 PM

_____

Image Area

2,925.8 acres

Impervious Cover

811.4 acres

27.8 %

Existing Tree Canopy

677.3 acres

23.2 %

Carbon Storage: 27,494.7 short tons; $568,694.2 @ $20.68 per short ton

   CO2 Equivalent Storage: 100,795.4 short tons; $568,694.2 @ $5.64 per short ton

Carbon Sequestration: 906.4 short tons; $18,748.2 @ $20.68 per short ton

   CO2 Equivalent Sequestration: 3,322.9 short tons; $18,748.2 @ $5.64 per short ton

Pollution Removal - CO: 671.8 pounds; $428.7 @ $0.64 per pound

Pollution Removal - NO2: 4.1 short tons; $37,164.8 @ $8986.57 per short ton

Pollution Removal - O3: 9.9 short tons; $88,799.6 @ $8986.57 per short ton

Pollution Removal - SO2: 2.1 short tons; $4,590.1 @ $2199.92 per short ton

Pollution Removal - PM10: 7.2 short tons; $43,337.9 @ $6000.12 per short ton

New User-Defined Tree Canopy

1,460.9 acres

Difference: 783.6 acres

50 %

Difference: 26.8 %

Carbon Storage: 59,306.0 short tons; $1,226,674.3 @ $20.68 per short ton

Difference: 31,811.4 short tons; $657,980

   CO2 Equivalent Storage: 217,415.8 short tons; $1,226,674.3 @ $5.64 per short ton

   Difference: 116,620.4 short tons; $657,980

Carbon Sequestration: 1,955.1 short tons; $40,439.8 @ $20.68 per short ton

Difference: 1,048.7 short tons; $21,692

   CO2 Equivalent Sequestration: 7,167.6 short tons; $40,439.8 @ $5.64 per short ton

AWN|canopy1.tif

| Expand All | Save | Print | Close |

NLCD Statistics

NLCD Image Area:
2,925.8 acres

Tree Canopy (TC):
677.3 acres
23.2 %

Impervious Cover (IC):
811.4 acres
27.8%

Developed (all):
2,305.1 acres
78.8 %
   TC: 12.1% IC: 35.2%

Forest (all):
409.7 acres
14 %
   TC: 75.6% IC: 0%

Wetlands (all
- wet1 & 2 tabs):
86.1 acres
2.9 %
   TC: 83.7% IC: 0%

Agriculture (all):
58.9 acres
2 %
   TC: 7.1% IC: 0%

Miscellaneous (all):
62.0 acres
2.1 %
   TC: 19.3% IC: 0%

Water:
4.0 acres
0.1 %

General | Developed | Forest | Wet 1 | Wet 2 | Agri | Misc | Pixel Info | Classes | About | Help

Zoom %

152.2 | Full Extent | Scroll Bars On | Legends On

Metric Units

Analysis Options

Save Output | Reset Output | Tree Canopy %Change: Region

start | 3 Windows Explorer | 5 Microsoft Office P... | i-Tree Vue (beta) | 89% | 9:26 PM

Making the Case for Trees and Green Space with Vue

Chicago Metro Area Aerial Image
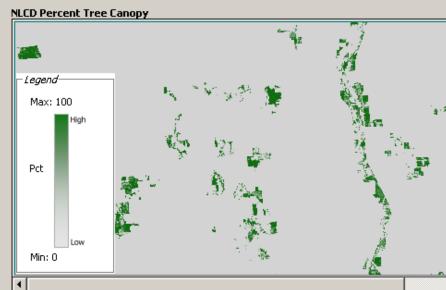
NLCD Land Cover Map

NLCD
Impervious
Cover Map

NLCD Tree Canopy Cover Map

g|LCFPD_landcover.tif

LCFPD i-Tree Vue Stats

- **NLCD Image area 24,967 acres**
- **Tree Canopy   39%**
- **Impervious Cover   2%**
- **Developed   3,766 acres**
- **Forest   11,400 acres**
- **Wetlands   1,765 acres**
- **Agriculture   4,437 acres**
- **Miscellaneous   2,010 acres**
- **Water   1,591 acres**

O3 Removal

Entire region.

*(O3 Removal * Tree Canopy)   note: all estimates are rounded*

Date: 5/15/2010 1:27:52 AM

_____

⊟ **Image Area**

24,969.6 acres

⊟ **Impervious Cover**

435.9 acres

1.9 %

⊟ **Tree Canopy**

9,017.7 acres

38.6 %

Pollution Removal - O3: 118.1 short tons; $1,061,606.3 @ $8986.57 per short ton

⊞ **NLCD Developed**

⊞ **NLCD Forest**

⊞ **NLCD Wetlands**

⊞ **NLCD Agriculture**

⊞ **NLCD Miscellaneous**

⊞ **NLCD Water**

| Expand All | Save | Print | Close |

LCFPD Tree Canopy Benefits

- **Carbon Storage (CO2)   1,342,004 (short ton)**

- **Carbon Sequestration(CO2)   44,242/ (ton/yr)**
- **CO Pollution Removal   6/ (ton/yr)**
- **NO2 Pollution Removal   66/ (ton/yr)**
- **O3 Pollution Removal   118/ (ton/yr)**
- **SO2 Pollution Removal   29/ (ton/yr)**
- **PM10 Pollution Removal   119/ (ton/yr)**

LCFPD Tree Canopy Monetary Benefit Estimates

- **Carbon Storage (CO2) $7,571,674**

- **Carbon Sequestration(CO2) $249,615/yr**
- **CO Pollution Removal $7,455/yr**
- **NO2 Pollution Removal $592,845/yr**
- **O3 Pollution Removal $1,061,606/yr**
- **SO2 Pollution Removal $63,843/yr**
- **PM10 Pollution Removal $713,673/yr**

Total $2,689,037/yr

Land Preservation Strategies

Integrate with Fund Raising Activities

Through the generous private support of area individuals, corporations and foundations, we are better able to preserve and protect our region's natural and cultural treasures and support critical education initiatives.

Before we move on...

... to Getting i-Tree into Communities