**HF Metadata Form**  rev. 24-Dec-2014

**NOTE**: Please complete a copy of this form for each new dataset. For ongoing projects enter only the information to be updated. Metadata should be entered as text. Graphics (maps, photos, etc) – if any – should be submitted as separate files. Please rename this file to include the Dataset ID (or your last name) in the filename. Required fields are marked with an asterisk.

**1 NAME\*** [Your name]

**Dan Flynn**

## 2 DATASET ID [Dataset ID number, if known (HF001, etc). New datasets will be assigned an ID number by the Information Manager.]

**New Data Set**

## 3 TITLE\* [Dataset title. Titles should include study location and dates. See the HF Data Archive for examples. Titles longer than 100 characters may be shortened.]

**Functional traits of selected tree species in Harvard Forest, the White Mountains, New Hampshire, and Saint-Hippolyte, Quebec 2015**

## 4 LEAD INVESTIGATOR(S)\* [Principal investigators and/or senior scientists responsible for the project (first and last name). Please list names in desired order.]

**Dan Flynn**

**Elizabeth Wolkovich**

**5 OTHER INVESTIGATOR(S)**  [Other key personnel (first and last name). Names will be listed in alphabetical order.]

**Cara O’Connor**

**Jehane Samaha**

**Timothy Savas**

**Harry Stone**

## 6 ABSTRACT\* [Concise (~1 page) abstract. Abstracts may contain multiple paragraphs and section headings.]

Populations of trees in temperate forests in the Northeast face different environmental conditions across their ranges. This project measured functional traits of trees at two to four sites, to provide a foundation for studies on the relationship between range shift, phenology, and functional traits. Study sites were selected at each degree latitude between 42 and 46 degrees: Harvard Forest, White Mountains and Second College Grant in New Hampshire, and, St. Hipplolyte, Quebec. Species were selected for this study based on their prevalence at least two of the four study sites; 44 species are included in this study. At each site, six or more representative individuals were selected for trait measurement. In the field, we measured diameter at breast height (DBH), number of stems, and height, as well as recording GPS coordinates of the individual. We collected leaf and stem samples to process the same day (leaf area, leaf fresh mass, and stem volume) or at a later date (stem mass, leaf dry mass, leaf percent nitrogen, leaf percent carbon, stomatal density) according to standard methodologies (Pérez-Harguindeguy et al. 2013, Aust J Bot). Leaf carbon and nitrogen was measured at the Torrey Laboratory at Harvard Forest, using a Elementar CHN Analyzer. In total, we sampled 854 individuals.

## 7 KEYWORDS\* [Keywords drawn from the LTER and HF keyword lists. See the HF Data Archive for keywords currently in use.]

carbon:nitrogen ratio

diameter at breast height

foliar nitrogen

forest ecology

leaf area

photosynthesis

plant height

specific leaf area

stems

wood

**8 LTER CORE AREA\*** [Please select one or more core areas from the list below]

|  |
| --- |
| primary production – **X** |
| Populations - **X** |
| organic matter |
| inorganic nutrients |
| disturbance |

## 9 LOCATION\* [See the HF Data Archive for location names currently in use. Enter NA for projects with no physical location (models, software tools, etc).]

Harvard Forest

Prospect Hill Tract (Harvard Forest)

Tom Swamp Tract (Harvard Forest)

Massachusetts

New Hampshire

Canada

## 10 LATITUDE\* [Latitude of study site. For multiple sites or landscape to regional studies, give the range in latitude. Use decimal fractions of a degree.]

42.46 to 46.00

**11 LONGITUDE\*** [Longitude of study site. For multiple sites or landscape to regional studies, give the range in longitude. Use decimal fractions of a degree.]

-74.02 to -71.05

**12 ELEVATION\*** [Elevation of study site in meters above sea level. For multiple sites or landscape to regional studies, give the range in elevation.]

266 to 505 m.a.s.l.

## 13 START DATE\* [Start date for data (field studies) or period studied (historical or paleo studies). Dates should describe the data, not (necessarily) the project. Include month and day if known. Enter NA for projects with no associated dates.]

June 2015

**14 END DATE\***  [End date for field data or period studied. Include month and day if known.]

July 2015

## 15 TAXA\* [Species, genera, families, etc studied. Include both scientific and common names. Enter NA for projects not focused on particular taxa.]

|  |  |
| --- | --- |
| **Species** | **Common** |
| Acer pensylvanicum | Striped maple |
| Acer rubrum | Red maple |
| Acer saccharum | Sugar maple |
| Acer spicatum | Mountain maple |
| Alnus incana subsp. rugosa | Speckled alder |
| Amelanchier canadensis | Canadian serviceberry |
| Amelanchier laevis | Smooth serviceberry |
| Aronia melanocarpa | Black chokecherry |
| Betula alleghaniensis | Yellow birch |
| Betula lenta | Cherry birch |
| Betula papyrifera | Paper birch |
| Betula populifolia | Gray birch |
| Cornus alternifolia | Alternate-leaved dogwood |
| Corylus cornuta | Beaked hazelnut |
| Diervilla lonicera | Bush honeysuckle |
| Fagus grandifolia | Beech |
| Fraxinus americana | White ash |
| Fraxinus nigra | Black ash |
| Hamamelis virginiana | Witch hazel |
| Ilex mucronatus | Mounain holly |
| Kalmia angustifolia | Sheep laurel |
| Lonicera canadensis | American honeysuckle |
| Lyonia ligustrina | Maleberry |
| Myrica gale | Sweetgale |
| Nyssa sylvatica | Black gum |
| Populus grandidentata | Big-toothed aspen |
| Populus tremuloides | Quaking aspen |
| Prunus pensylvanica | Pin cherry |
| Quercus alba | White oak |
| Quercus rubra | Red oak |
| Quercus velutina | Black oak |
| Rhamnus frangula | Buckthorn |
| Rhododendron prinophyllum | Early azalea |
| Ribes glandulosum | Skunk currant |
| Sambucus racemosa | Red elderberry |
| Sorbus americana | American mountain-ash |
| Spiraea alba | White meadowsweet |
| Spiraea tomentosa | Steeplebush |
| Tilia americana | American linden |
| Ulmus americana | American elm |
| Vaccinium myrtilloides | Velvet-leaved blueberry |
| Viburnum cassinoides | With-rod |
| Viburnum lantanoides | Hobblebush |

## 16 CONTACT\* [Contact person to answer questions about project methods or use of data (first and last name). Please include mailing address, email address, and phone number.]

Elizabeth Wolkovich

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ph: 604.827.5246

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Canada

**17 METHODS\*** [Description of methods not covered in the Abstract. Methods may contain multiple paragraphs and sections headings.]

**18 PROJECT STATUS\*** [Please select one option from the list below]

|  |
| --- |
| Completed **– X** |
| ongoing |

**19 RESEARCH TOPIC\***  [Please select one or more research topics from the list below]

|  |
| --- |
| biodiversity studies - **X** |
| conservation and management |
| ecological informatics and modelling |
| forest-atmosphere exchange |
| historical and retrospective studies |
| international research projects |
| invasive plants, pests and pathogens |
| large experiments and permanent plot studies - **X** |
| physiological ecology, population dynamics and species interactions - **X** |
| regional studies - **X** |
| soil carbon and nitrogen dynamics |
| watershed ecology |

**20 STUDY TYPE\***  [Please select one or more study types from the list below]

|  |
| --- |
| long-term measurements |
| short-term measurements - **X** |
| historical studies |
| paleological studies |
| modeling studies |

## 21 RELATED LINKS [List any related links (project website, etc)]

## 22 RELATED DATASETS [List any related datasets in the HF Data Archive]

**23 PUBLICATIONS\*** [List all related publications. For ongoing projects, list new publications.]

**24 DATA TABLES\*** [List all new or updated data tables (or other data objects). Metadata for each table (variable name, variable description, measurement units, codes, etc) may be entered here or submitted as separate files.]

|  |  |  |
| --- | --- | --- |
| **Traits** |  |  |
|  |  |  |
| **Column** | **Units** | **Notes** |
| Individual |  |  |
| Site |  | One of four sites: Harvard Forest (HF), White Mountains (WM), Second College Grant (GR), St. Hipplolyte, Quebec (SH) |
| Species |  | Six letter code for species |
| Latitude | deg |  |
| Longitude | deg |  |
| Elevation | m |  |
| Leaf area | cm2 |  |
| Fresh mass | g |  |
| Dry mass | g |  |
| Stem volume | cm3 |  |
| Stem mass | g |  |
| Height | m |  |
| Distance | m | Distance from tree, for measuring height |
| Bottom m | m |  |
| Top m | m |  |
| DBH | cm | Diameter at breast height (1.3m) |
| DBH 2 | cm | Diameter of second stem, if applicable |
| DBH 3 | cm | Diameter of third stem, if applicable |
| Summer 2015 notes |  |  |
| Summer 2015 Route |  | Sample route name and map |
| Summer 2015 Date Sampled |  |  |
| N | percent | Percent foliar nitrogen |
| C | percent | Percent foliar carbon |
| Stomatal length | um | Mean of 5 stomates per image view. There were 1-3 views per individual plant |
| Stomatal density | per mm^2 | Mean number of stomata per image view. |

|  |  |
| --- | --- |
| **Species Info** |  |
| **Column** | **Notes** |
| Species | Full |
| Genus | Genus name we are using |
| sp | Species name as we are using |
| Common | Common name, usually referenced from gobotany.newenglandwild.org |
| Code | Six letter code |
| ID | ID in The Plant List (TPL), using Taxonstand package in R |
| TPL\_version | Version of TPL used |
| Taxonomic.status | Taxonomic status as in TPL |
| Family | Family name extracted from TPL |
| New.Genus | Genus name extracted from TPL |
| New.Species | Species name extracted from TPL |
| Authority | Taxonomic authority extracted from TPL |