The Bement School
Jill Craig
Pine Hill Outdoor Edu. Coordinator
5th Grade—26 students
Buds, Leaves and Global Warming
Phenology
Acton-Boxborough Regional High School

Teacher: Erin Bengiovanni
Buds, Leaves and Global Warming

Box Elder  Yellow Birch  Lilac  Flowering Dogwood
Fall Data Collection-
Measuring New Growth
of our Hemlocks

Making observations of what plants would succeed if the Hemlocks were gone.
Captain Samuel Brown School

Teacher: Diane Bugler

Our Changing Forests

Peabody, MA
Teacher: Michael McCarthy

Our Changing Forests    And    Buds, Leaves and Global Warming

Links:
Our Changing Forests Thurston Middle School 2018

Buds, Leaves, and Global Warming Thurston Middle School 2018-19
Saint Mary’s Parish School

Teacher: Mary Reed

Buds, Leaves and Global Warming

Westfield, MA
Innovation Charter School
Teacher: Katherine Hinkle

Woolly Bully

Our campus, Tyngsboro, MA
Our Hemlock Grove
The Hydrology of Ponds and Vernal Pools at Drumlin Farm
A 10 year study

- Drought and extreme precipitation influence hydroperiods and amphibian and fairy shrimp reproduction
- Upland and wetland connections are important to amphibian survival
- Diversity of ponds and slowing the flow are important in respect to climate change
- Resiliency

Educator: Sally Farrow
Phenology at Drumlin Farm and Two sites in Lowell MA

Trees at Drumlin Farm

Trees in Lowell

Educator: Sally Farrow
Our Changing Forest Drumlin Farm and LP&CT West Meadow Property in Lowell

Drumlin Farm

West Meadow Lowell

Educator: Sally Farrow
Louise Levy, Belchertown High School

Buds, Leaves and Global Warming-Year-10
Our Changing Forests-Year 3

Provide **Experiences** to Scaffold the Learning
Local opportunities in Belchertown

2nd grade field trip to Lake Wallace
Eco students run a field trip for the entire 2nd grade

Carriage Grove:
redevelopment of 80 acres (the former Belchertown State School) right across the street from the schools
### SPRING PREDICTIONS

<table>
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<tr>
<th>What type of tree are you observing?</th>
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<td>Thinking about the winter and beginning of spring we’ve had, when do you think your branch will begin to leaf out? When do you think your branch will completely finish leafing out? Why?</td>
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| Sketch a close-up of your branch. Circle any buds you think will be viable. |
Choate Rosemary Hall
Our Changing Forests
Joseph Scanio
Glen Urquhart School
Our Changing Forests
7th Grade Science
Plot #1

Teacher: Emilie Cushing
Trinity Catholic Academy
Grades 4 & 5
Mrs. Colleen Casey and Mrs. Lori Primavera

Buds, Leaves, and Global Warming
Our Changing Forests
Teacher: Jeff Sautter

2 Forest Plots
- Plot 1: Deep in woods relatively undisturbed
- Plot 2: Clear cut
John R Briggs Elementary School
Ashburnham, Ma.
Teacher: Kate Bennett

Putting the “EA” in STEAM
Before you go out to your plots and assuming you have at least one year of data, also good to have two sites to compare.

- Students look at graphs generated by Harvard Forest for local plots
- Answer questions about the graphs
- Then describe the sites
- Then they go out and see how the sites compare to their descriptions

Visualizing Forests from graphs worksheet
Goals for my students...to be curious & ask questions about their natural world, actively participate in real science and be outside.
Nurturing Teacher Leaders

Mini Grants Support Curriculum Development and Conference Presentations

Harvard Forest SY Spring Workshop, April 2018
Mass. Assoc. of Science Teachers (MAST) and Ct. Science Teachers Association November 2018

LTER All Scientists Meeting, Ca. Oct. 2018

Pamela Snow
Harvard Forest Published First Data Nugget
Stand Alone Educational Activity through Datasets

HF Project Coach, Fiona Jevons’ Poster
LTER ASM
What’s New 2019-20

• More HF-developed Map and Graphing Tools; Teacher-Developed Activities
• Research Experience for Teachers (National Science Foundation) Funding for Summer 2019

3 New Mini Grants for Changing Forests Project
Teachers to develop student learning activities using a new land-use planning tool, the New England Landscape Futures (NELF) Explorer

• Jeff Sautter, Athol-Royalston Regional Middle School
• Tara Alcorn, Greater Lowell Technical School
• Joseph Scanio, Choate-Rosemary Hall School

HF Senior Ecologist, Neil Pederson awarded RET funding to hire Quabbin Reg. HS teacher, Elicia Andrews to will work in a small team to study how climate change affects growth in trees living in a “transitional zone”. RET Andrews will develop a Tree Ring Data Nugget at the conclusion of field and lab work.