**New England Adaptive Silviculture for Climate Change Update**

**September, 2016**

***An operational-scale forest management installation of New England Adaptive Silviculture for Climate Change at Dartmouth’s Second College Grant with a deep dive into associated science conducted at Hubbard Brook by associated scientists***

**Full Installation Location**

Dartmouth Second College Grant (total treatment area=160 ha, with four, 40 ha blocks)

**Stakeholder Workshop**

August 2-3 2016: Stakeholders and Scientists (Dartmouth, UVM, USFS NRS, WMNF, VT ANR, NH Fish and Game, NIACS) identified treatment locations and developed prescriptions in context of anticipated climate change

**Timeline**

*Fall 2016:* Develop marking guides based on ASCC treatments, file “intent to cut”

*Winter-Spring 2016-2017:* Finalize monitoring details

*Early summer 2017:* Pre-treatment sampling

*Late summer-winter 2017:* Conduct treatments

*Spring 2018:* Plant seedlings in Transition Treatment

*Summer 2018:* Post-treatment sampling

**Treatment Synopses**

*Resistance*

* Maintain current composition and structure: S Maple > Beech > Y Birch > R Maple > R Spruce > other
* Encourage a multi-aged / size structure (reverse-J diameter distribution), and maintain quality across all size classes
* Maintain current abundance of snags and downed dead wood

*Resilience*

* Maintain species composition as a northern hardwood forest with some deviation from current conditions (multiple recovery pathways)
* Increase proportion of wind and ice resistant species and tree forms
* Maintain/increase (favor) Y Birch and R Spruce component
* Increase abundance of drought-adapted species currently on site (R Maple, Beech)
* Increase amount of dead wood for safe sites for regen, erosion control, and moisture retention on site

*Transition*

* Increase abundance of future-adapted species favoring those better able to tolerate variable conditions and disturbance (drought, inundation, etc.)
* Change species composition while also increasing species richness (portfolio approach): 50% regeneration is future-adapted species already on site (n. hardwoods), 50% new species from off-site (slightly shifting away from strictly n. hardwoods) (Northern red oak, bitternut hickory, eastern white pine, eastern hemlock, basswood, black birch, bigtooth aspen)
* Increase representation of shade tolerant conifer component that is future-adapted to maintain habitat and hydrologic functions
* Increase amounts of dead wood to retain moisture, ameliorate episodic hydrological events (mitigate overland flow, stabilize hydrology), and provide microhabitat (e.g. nurse logs, browse protection)
* Improve quality and representation of a wide range of tree functional forms and species that provide hydrological function

**Diving Deep into ASCC Science at Hubbard Brook EF (examples)**

* Replace CCASE sapling experiment species with ASCC species (Templer et al.)
* Vertical hydrological budget monitoring within ASCC treatments (Green, Bailey, et al.). Calibrate point-scale measurements near eddy covariance towers so that large plot-scale impacts can be better quantified. Focus measurements would be soil moisture and tension, and temperature/relative humidity through the canopy.
* Paired watershed evaluation of impacts of coarse wood augmentation via directional leave tree felling on hydrological and energy budgets.