

Links to .pdf files for all assigned readings are provided at <https://cfc.cfans.umn.edu/nasp13-course-content>.

BACKGROUND READINGS:

Frelich, L.E. 2002. Disturbance, stand development, and successional trajectories. pp 90-123 *In* Forest Dynamics and Disturbance Regimes: Studies from Temperate Evergreen-deciduous Forests. Cambridge University Press, New York.

Stearns, F.W. 1997. History of the Lake States Forests: Natural and Human Impacts. *In* Lake States Regional Forest Resources Assessment: Technical Papers, J.M. Vasievich and H.H. Webster, editors. USDA Forest Service GTR NC-189, 35p.

DeRose, R.J. and J.N. Long. 2014. Resistance and resilience: A conceptual framework for silviculture. *Forest Science* 60(6): 1205-1212.

BACKGROUND LECTURE CONTENT:

Refer to the NASP YouTube playlist: <http://z.umn.edu/NASP-videos>. Although some video content will be a review, we expect you to be familiar with it - in general, we will not cover this content again in class.

- [Intro to Silviculture](#)
- [Silvics](#)
- [Silviculture: Growing Space](#)
- [Silviculture Terminology](#)
- [Silvicultural Systems](#)
[Forest inventory for silvicultural decision making](#)
- [Correct instrument usage for forest inventory: Angle gauge and prism](#)
- [Stand Dynamics](#)
- [Writing Silvicultural Prescriptions](#)
- [Understanding Treaty Rights and Obligations](#) (note this video is not in the NASP YouTube playlist)

WEEK 1

Monday July 22

Silvics and tree growth (Windmuller-Campione & Sagor):

Background reading and background lecture content as described above

Landscape ecology (Knight):

Turner, M.G. 2005. Landscape ecology: what is the state of the science? Annual review of ecology, evolution, and systematics: 319-344.

Communication skills (Rodman & Sagor):

None

Discussion/critique assignment (Windmuller-Campione):

Readings to be distributed in class on July 22

Tuesday July 23

Climate change & silvicultural strategies (Swanston, Nagel, & Janowiak):

Janowiak, M.K., C.W. Swanston, L.M. Nagel, L.A. Brandt, P.R. Butler, S.D. Handler, P.D. Shannon, L.R. Iverson, S.N. Matthews, A. Prasad, and M.P. Peters. 2014. A practical approach for translating climate change adaptation principles into forest management actions. Journal of Forestry 112(5): 424-433.

Forest growth, productivity, & stand dynamics (Windmuller-Campione):

Johnson, E.A. and K. Miyanishi. 2007. Disturbance and Succession, pp 1-14 In Johnson, E.A. and K. Miyanishi (editors) Plant Disturbance Ecology: The Process and the Response. Elsevier Inc, 698 pgs.

O'Hara, K.L. 2016. What is close-to-nature silviculture in a changing world?. Forestry 89 (1): 1-6. doi: 10.1093/forestry/cpv043

Wednesday July 24

Habitat typing (Windmuller-Campione, Sagor, & MN DNR):

Cook, J.E., 1996. Implications of modern successional theory for habitat typing: a review. Forest Science, 42(1), pp.67-75.

Windmuller-Campione, M.A., Kotar, J. and Nagel, N.M., 2015. Habitat types-What they can tell us now and in the future. Applied Ecology and Environmental Research, 13(3), pp.893-913.

Aaseng, N.E., J.C. Almendinger, R.P. Dana, D.S. Hanson, M.D. Lee, E.R. Rowe, K.A. Rusterholz, D.S. Wovcha. 2011. Minnesota's native plant community classification: A statewide classification of terrestrial and wetland vegetation based on numerical analysis of plot data. Biological Report No. 108. Minnesota County Biological Survey, Ecological Land Classification Program, and Natural Heritage and Nongame Research Program. St. Paul: Minnesota Department of Natural Resources.

OPTIONAL

Fond du Lac Natural Resources:

[Treaty Rights and the Chippewa National Forest](#) (note this video is not in the NASP YouTube playlist)

Thursday July 25

Tree physiology (Savage):

Reich, P. B., K.M. Sendall, A. Stefanski, X. Wei, R.L. Rich, and R.A. Montgomery. 2016. Boreal and temperate trees show strong acclimation of respiration to warming. *Nature* 531(7596), 633-636.

O'Brien, M. J., B.M..J. Engelbrecht, J. Joswig, G. Pereyra, B. Schuldt, S. Jansen, J. Kattge, S.M. Landhäusser, S.R. Levick, Y. Preisler, P. Väänänen, and C. Macinnis-Ng, 2017. A synthesis of tree functional traits related to drought-induced mortality in forests across climatic zones. *Journal of Applied Ecology*. doi:10.1111/1365-2664.12874

Friday July 26

Forest health & disturbances (Russell):

Russell, M and M. Albers. 2016. Eastern spruce budworm: Management Approaches in Minnesota's Forests. University of Minnesota Extension Factsheet.

Measuring ecosystems attributes (Sagor):

Barnes, B.V., D.R. Zak, S.R. Denton and S.H. Spurr. 1998. Site quality and ecosystem evaluation. In *Forest Ecology*, 4th edition. John Wiley and Sons, Inc. pp 298-329.

Videos (<http://z.umn.edu/NASP-videos>):

- Forest Inventory for Silviculture Decision Making (we will open with students discussing this content and its relevance to your work)
- Correct Instrument Usage for Forest Inventory: Angle Gauge and Prism **OPTIONAL**

Saturday July 27

All day integrated field trip:

None

WEEK 2

Monday July 29

Genetics (David)

David, A. Genetic Readings and Vocabulary.

Ledig, F.T. 1992. Human impacts on genetic diversity in forest ecosystems. *Oikos*, 63: 87-108.

Zobel, B., J. Talbert. 1984. Variation and its uses. In *Applied Forest Tree Improvement* (pp. 40-74). John Wiley & Sons.

Tuesday July 30

Geology, landforms, soils, hydrology, and watersheds (Grigal & Karwan)

Barnes, B.V., D.R. Zak, S.R. Denton, and S.H. Spurr. 1997. Chapter 11, Soil. p. 255-278. In *Forest Ecology*, 4th Edition. John Wiley and Sons, New York. ISBN : 0471308226.

Buttle, J. M. 2011. The effects of forest harvesting on forest hydrology and biogeochemistry. In *Forest Hydrology and Biogeochemistry* (pp. 659-677). Springer Netherlands.

Powers, R.F., D.A. Scott, F.G. Sanchez, R.A. Voldseth, D. Page-Dumroese, J.D. Elioff and D.M. Stone. 2005. The North American long-term soil productivity experiment: Findings from the first decade of research. *Forest Ecology and Management* 220: 31-50. **OPTIONAL**

Measuring ecosystem attributes (Sagor & Windmuller-Campione)

See readings from July 26

Wednesday July 31

All day integrated fieldtrip at the Marcell Experimental Forest

None

Thursday August 1

Fire ecology (Varner):

Agee, J.K. and C.N. Skinner. 2005. Basic principles of forest fuel reduction treatments. *Forest Ecology and Management* 211: 83-96.

Ryan, K.C., E.E. Knapp and J.M. Varner. 2013. Prescribed fire in North American forests and woodlands: history, current practice, and challenges. *Frontiers in Ecology and the Environment* (11): e15-e24.

Forest ecology wrap-up (Windmuller-Campione):

None

Friday August 2

Final exams and module wrap-up

None