

Lecture #16: Planning Against Disaster

Suggested Readings:

Erwin Hargrove & Paul Conkin, eds., *TVA: Fifty Years of Grass-roots Bureaucracy* (1983)
Harry L. Henderson & David B. Woolner, eds., *FDR and the Environment* (2005)
Paul Sutter, *Let Us Now Praise Famous Gullies: Providence Canyon and the Soils of the South* (2015)
Ronald C. Tobey, *Saving the Prairies* (1981 (on Clements & grassland ecology))
Donald Worster, *Dust Bowl: The Southern Plains in the 1930s* (1979)
Pare Lorentz, *Plow That Broke the Plains* (classic 25-minute documentary film), 1936, available online at:
http://archive.org/details/plow_that_broke_the_plains
Geoff Cunfer, *On the Great Plains: Agriculture and Environment* (2005)
Richard White, *The Organic Machine: The Remaking of the Columbia River* (1995)
Neil M. Maher, *Nature's New Deal: The Civilian Conservation Corps and the Roots of the American Environmental Movement* (2007)

Outline

I. TVA: Conservation and the Vision of Regional Planning

Tennessee River: most eastern rainfall, Muscle Shoals second only to Niagara in volume of water flowing
National Defense Act 1916: nitrate plant at Muscle Shoals, Wilson Dam completed 1925
linkage of hydroelectricity with energy-intensive industry (nitrates, aluminum, nuclear), and hence with military expenditures during wartime; boosted in South as fertilizer and power source for urban-industrial development, with Feds providing capital
Haber-Bosch process for nitrogen fixation converts atmospheric nitrogen (N₂) to ammonia (NH₃), but requires large amounts of energy; Fritz Haber won 1918 Nobel Prize for this
Muscle Shoals controversy of 1920s: public vs private power; local development in northern Alabama vs wider power source; regional planning vs particularistic development
Nebraska Sen. George Norris key promoter of hydro development, numerous bills, compromises
factions: N Dems & W/MW Reps support public power; NE Reps oppose govt comp with private
Harding, Coolidge, Hoover all oppose public intervention, but Hoover great conservationist
FDR's election broke deadlock on Tennessee Valley, broadened mandate toward large-scale regional planning which FDR had derived from numerous sources: uncle Frederick Delano, urban & regional planning, Howard Odum's regional studies at Chapel Hill (Odum's sons would go on to be among leading ecologists of next generation), etc.
1933: Tennessee Valley Authority Act creates TVA with goal of region-wide planning
original constitutional basis for Federal water acts--navigation, flood control--now broadened to include hydropower development regionwide, but also social planning
TVA designed to modernize depressed farming region of eroded hill country: agents educate farm families about anti-erosion measures, construct new houses, electrical methods, business techniques, wage labor in construction, highways, urban links, tourism=
Built on tradition of USDA agricultural extension supported by Smith-Lever Act of 1914, which created cooperative extension services whereby land-grant universities made their knowledge widely available to rural areas

II. CCC: Conservation and the Army of Unemployed

Key ally of TVA and other Fed agencies: Civilian Conservation Corps, created 1933:
recruit young men, 17-23 to fight unemployment and supply labor for conservation measures
\$30/month, room, board, camps around country for anti-erosion, planting, roads, parks
by 1939, 8.5 mill man-days to conservation, 2.18 mill men employed, 1.575 billion trees planted, 140,000 miles roads & trails built
CCC as scientific management and planning applied to social/economic problems, but also almost incidentally a crucial labor force conservation throughout nation
note that modernizing influences of TVA were promulgated nationwide by the Rural Electrification Act in 1935:
federal government provides capital via loans for extending electrical distribution lines to rural areas

III. Erosion and Communal Disaster: Soil Conservation

erosion as ruling metaphor for not just ecological, but economic and social failure, waste
varieties of erosive experience: sheet erosion, gully erosion, wind erosion
(NB also big floods of 1920s, attributed to deforestation at river headwaters [cf. Marsh])
Hugh Hammond Bennett's *Soil Conservation*, 1939, became great overview textbook on this subject for generation
gully erosion in Stewart County, GA, became poster child for severity of problem: Georgia's "Little Grand Canyon"
painter Alexandre Hogue, b. 1898, as important regionalist/realist painter in late 1930s, Great Plains and desert SW as chief subjects; religious symbolism of crucified land

IV. Rise and Fall of the Grassland School of Ecology

Charles Bessey's botany classes at U. Nebraska, 1880s-90s, attracted star group of students; anti-nature study, sought rigorous scientific training, authored classic botany text: *Botany for High Schools & Colleges*, 1880, to promote serious HS science

students formed Sem Bot club, leading members: Roscoe Pound & Frederic Edward Clements

Bessey opposed to non-laboratory botany as non-rigorous, too much like natural history

Clements & others attracted to relations *among* plant species, hence left lab to study plant *communities*, but applied rigorous Bessey's scientific techniques to work

1905: *Research Methods in Ecology* promoted transect, bisect (roots), and quadrat to map co-occurrence of species, led to quantitative approach to ecological research

Clements argued that essential ecological unit of vegetation was *formation*, a super-organism with an identity apart from individual species comprising it, with genuine life cycle of its own, passing through regular phases toward maturity

sequence of stages was *succession*; stable mature stage, capability of existing indefinitely in the absence of disturbance, was *climax*

(succession concept anticipated by Eugene Warming in Denmark, Henry C. Cowles in Chicago)

super-organism actually a very problematic concept, as later ecologists would demonstrate

crisis in Clements' paradigm would come in 1930s, when serious drought succeeded in destroying the supposedly "stable" climax; Clementsian school eventually declined, drifted into range management without guiding vision of stable climax

scientific techniques would be among those called into service of regional planning

V. Dust Bowl

Plains drought worst in nation's history, 9 years below ave rain, 1934 worst ever at 9", origins not merely climatic, however: overgrazing, land plowed too deep by dry-farming techniques, WWI expansion had prompted massive investment in new land, tractors, equipment, and subsequent depression brought bankruptcy

net result was that land was no longer protected by crop cover, open to winds

May 1934 ushered in Dust Bowl when 9 May storm carried 350 million tons to East Coast in single storm; massive duststorms eroded hundreds of millions tons of soil

govt intervention: shelterbelts (cf. Marsh's climatic theories), contour plowing to compensate for grid field boundaries, Resettlement Administration to relocate farms off of marginal lands (end of frontier vision), Taylor Grazing Act to end homesteading on rangelands; reliance on experts to redirect social destiny of rural land & people

John Steinbeck's *Grapes of Wrath*, 1939, became most compelling popular account of "Okie" migration

Pare Lorentz's classic 1936 documentary film, *Plow That Broke the Plains*, promulgated New Deal interpretation that unwise use of technology had created the Dust Bowl, caused widespread controversy in Plains States

Alexandre Hogue's "Mother Earth Laid Bare" (1938), "The Crucified Land" (1939): icons

technology to solve technological prob: but what of underlying social/economic system?