

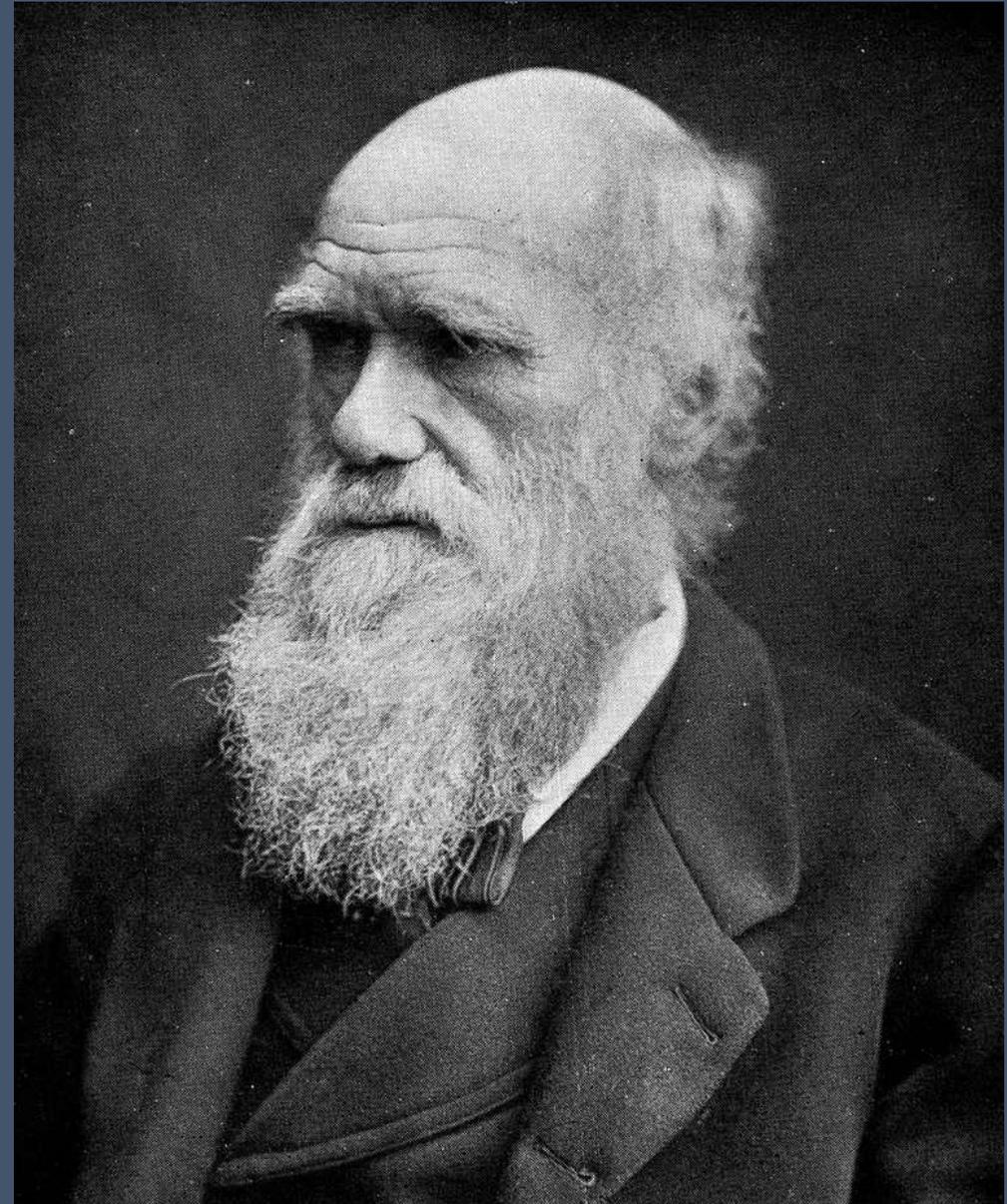
Reflections on ecosystem service classification for the SEEA-EEA

Ken Bagstad

Research Economist, U.S. Geological Survey

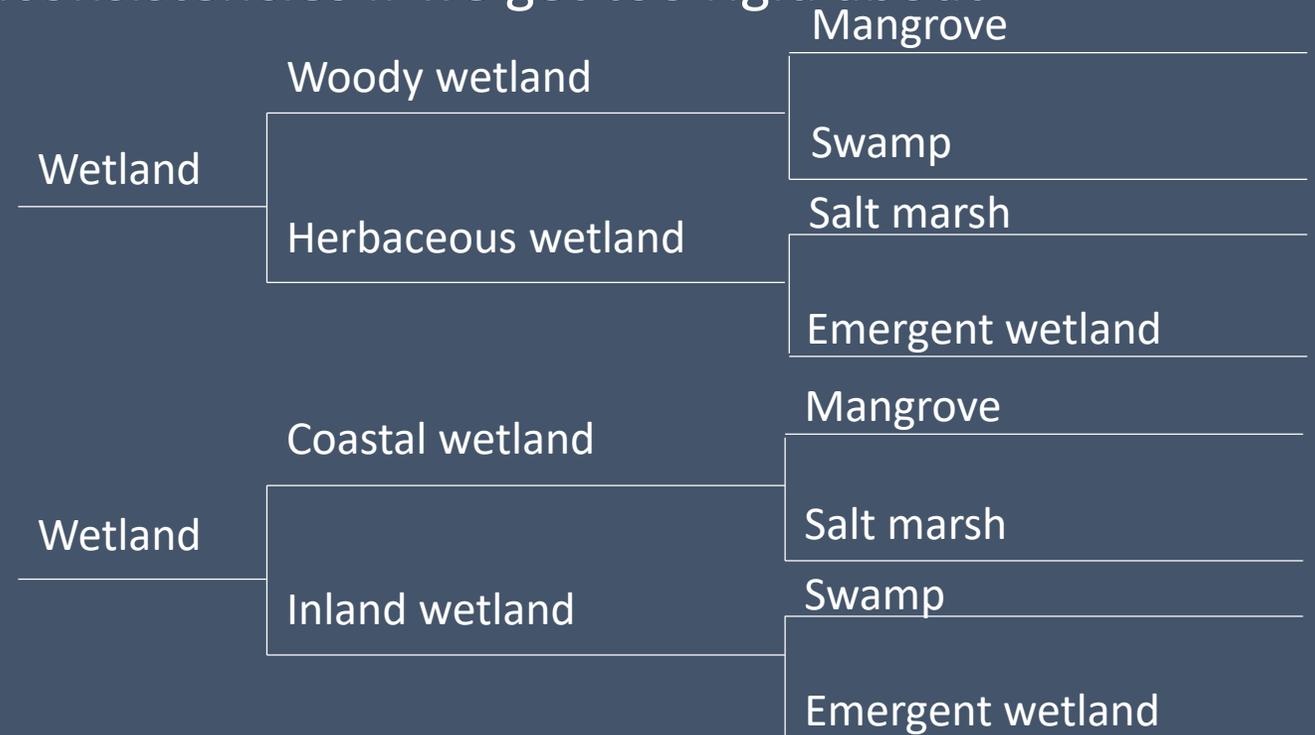
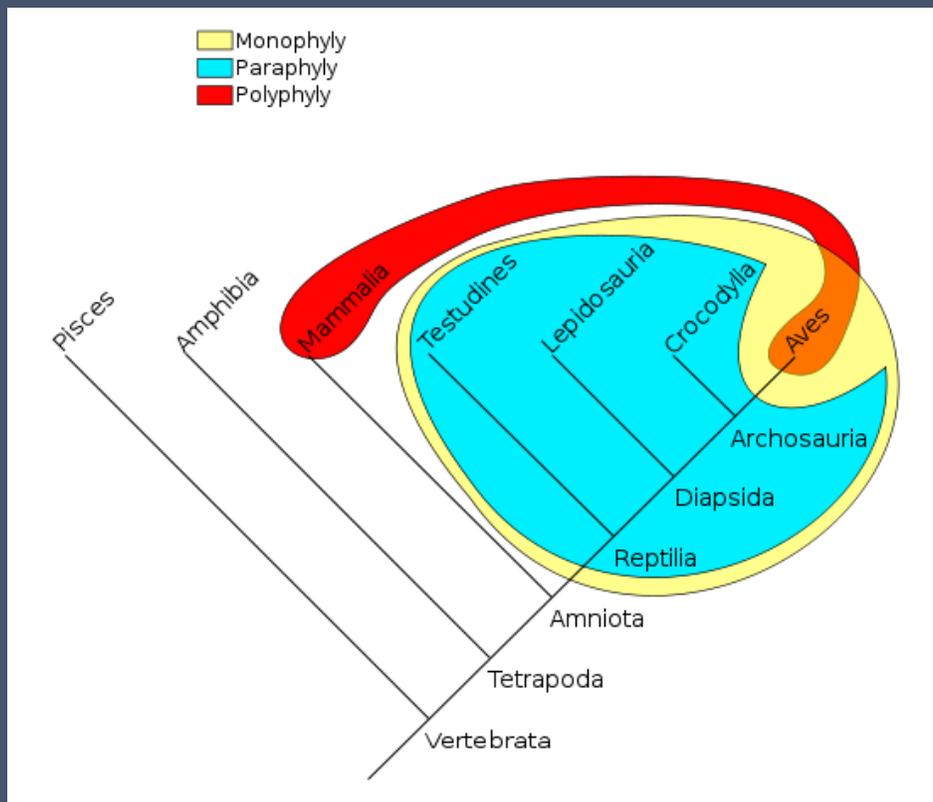
Hierarchy & classification

- Darwin: Lumpers and “hair-splitters”
- Freeman Dyson: materialists (atomistic worldview) vs. Platonists (world of ideas)
- An age-old philosophical problem: we can set conventions but not likely “solve” (going too far to one extreme could alienate users)



Problems with hierarchical classification

- Are we combining or separating things that shouldn't?
 - Potential to introduce logical inconsistencies if we get too rigid about imposing hierarchies



Which is right? Modifier-based system possibly more logical than hierarchical when working with multiple modifiers

What are we doing in the U.S.?

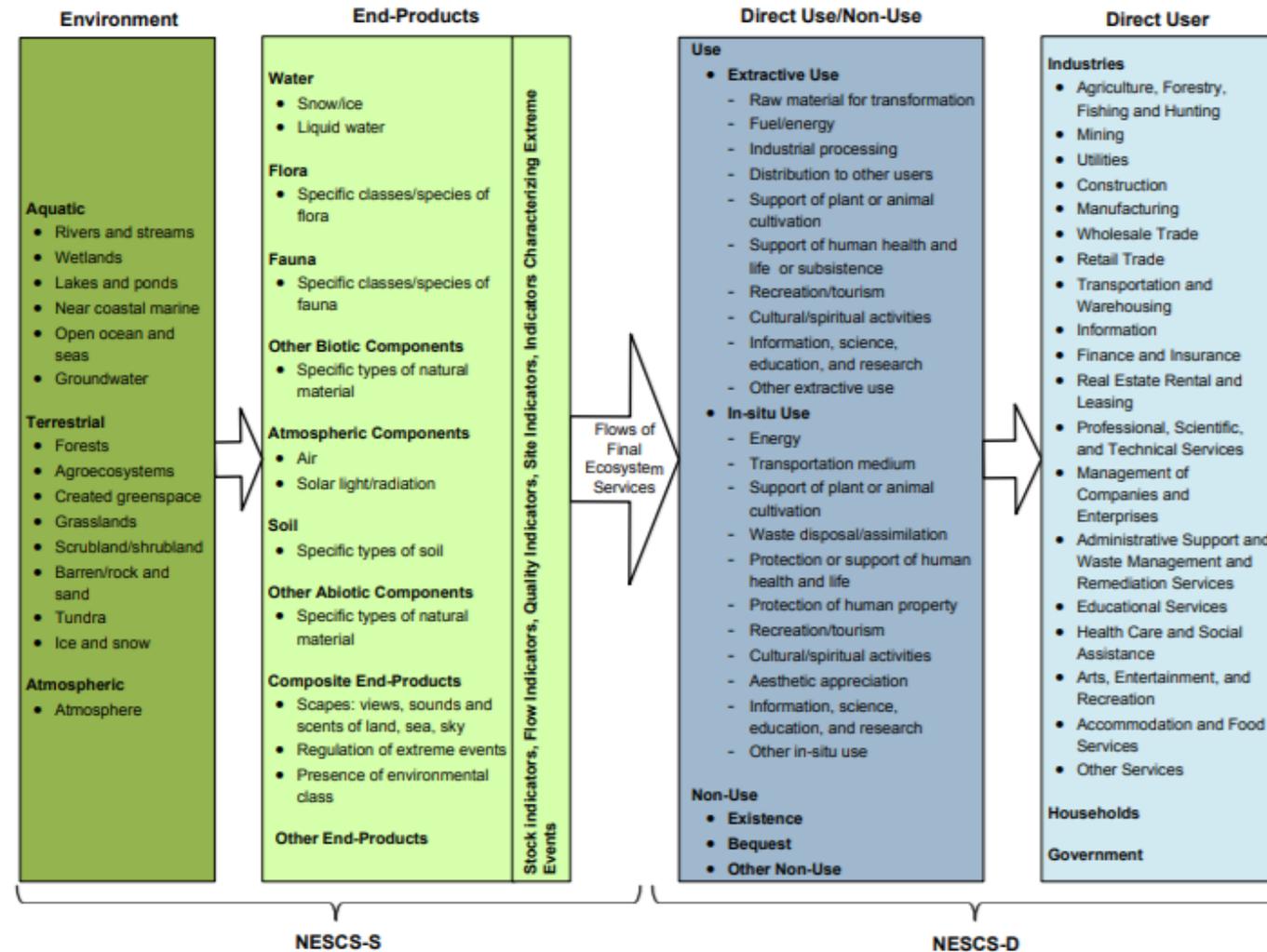
Provides all the row/ column headings that we need (industries, ecosystems, ecosystem services)

Table ES-1. NESCS Example

	NESCS-S		NESCS-D	
Group	Environment	End-Product	Direct Use/Non-Use	Direct User
Definition	Spatial units, with similar biophysical characteristics, that are located on or near the Earth's surface and that contain or produce "end-products"	Biophysical components of nature that are directly used or appreciated by humans	Different ways in which end-products are used or appreciated by humans	Entities that directly use or appreciate the end-products
Hierarchy and Coding System				
NESCS Code for FFES*: WW.XX.YYYY.ZZZZZZ				
Class	W	WW.X	WW.XX.Y	WW.XX.YYYY.Z
Subclass	WW	WW.XX	WW.XX.YY	WW.XX.YYYY.ZZZ
Detail			WW.XX.YYYY	WW.XX.YYYY.ZZZZZZ
Example 1: Water in the ocean being used as a medium for freight transportation				
NESCS Code for FFES: 15.12.1202.1483111				
Class	Aquatic: 1	Water: 1	Direct Use: 1	Industry: 1
Subclass	Open Ocean and Seas: 15	Liquid Water: 12	In-Situ Use: 12	Transportation and Warehousing: 148
Detail			Transportation medium: 1202	Deep Sea Freight Transportation: 1483111
Example 2: Water in rivers being extracted for household gardening purposes				
NESCS Code for FFES: 11.12.1105.201				
Class	Aquatic: 1	Water: 1	Direct Use: 1	Households: 2
Subclass	Rivers and Streams: 11	Liquid Water: 12	Extractive Use: 11	Households: 201
Detail			Support of plant or animal cultivation: 1105	

What are we doing in the U.S.?

Figure ES-2. Proposed Four-Group NESCS Structure



What are we doing in the U.S.?

- Application to 10 states in U.S. Southeast
 - Work nearly complete, submitted by late 2018
- Scaling up to 48-state region (excluding AK, HI)
 - Work in progress, funded through early 2021

Table 4-6. Classification of Direct Use/Non-Use

Direct Use/Non-Use Class	Direct Use/Non-Use Subclass	Direct Use/Non-Use Detail	Direct Use/Non-Use Detail Definition
1. Direct Use	11. Extractive Use	1101. Raw material for transformation	Extracted or harvested and transformed into other commercial products
		1102. Fuel/energy	Extracted or harvested and directly used as an energy source for commercial production
		1103. Industrial processing	Extracted or harvested and directly used in other ways as a material in industrial processing
		1104. Distribution to other users	Extracted or harvested for distribution to other users
		1105. Support of plant or animal cultivation	Extracted or harvested to support human cultivation of plant or animal life
		1106. Support of human health and life or subsistence	Extracted or harvested and directly used by humans for subsistence, health, or other life support
		1107. Recreation/tourism	Extracted or harvested as part of an outdoor recreational or nature tourist activity
		1108. Cultural/spiritual activities	Extracted or harvested as part of a non-recreational cultural or spiritual activity
		1109. Information, science, education, and research	Extracted or harvested to directly support scientific research or education
		1199. Other extractive use	Extracted or harvested for other uses
	12. In-situ Use	1201. Energy	Used in situ as a source of energy for commercial production
		1202. Transportation medium	Used in situ as a medium for transporting goods or humans
		1203. Support of plant or animal cultivation	Used in situ to support human cultivation of plant or animal life
		1204. Waste disposal/assimilation	Used in situ as a sink for assimilating and disposing of waste
		1205. Protection or support of human health and life	Used in situ to protect against damages or otherwise support human health and life
		1206. Protection of human property	Used in situ to protect against damages to human property
		1207. Recreation/tourism	Used in situ as part of an outdoor recreational or nature tourist activity
		1208. Cultural/spiritual activities	Used in situ as part of a non-recreational cultural or spiritual activity
		1209. Aesthetic appreciation	Used in situ for aesthetic (visual and other senses) appreciation, separate from outdoor/nature recreational, tourist, cultural or spiritual activities
		1210. Information, science, education, and research	Used in situ to directly support scientific research or education
		1299. Other in-situ use	Used in situ for other purposes
2. Non-Use	21. Existence	2101. Existence	Appreciated and valued by humans for

Closing thoughts:

Splitting & lumping - can we have it both ways?

- Because of their multifaceted nature, ecosystem services are an inherently harder classification problem than industries or even ecosystems
- NESCS gives us a flexible where-what-why-who classification: Seems to reflect this multifaceted nature well
 - Others can talk better about the contrast between CICES & NESCS
- Provide a top-level classification that provides some structure & consistency, let the splitters take it to as fine a scale as they want?