

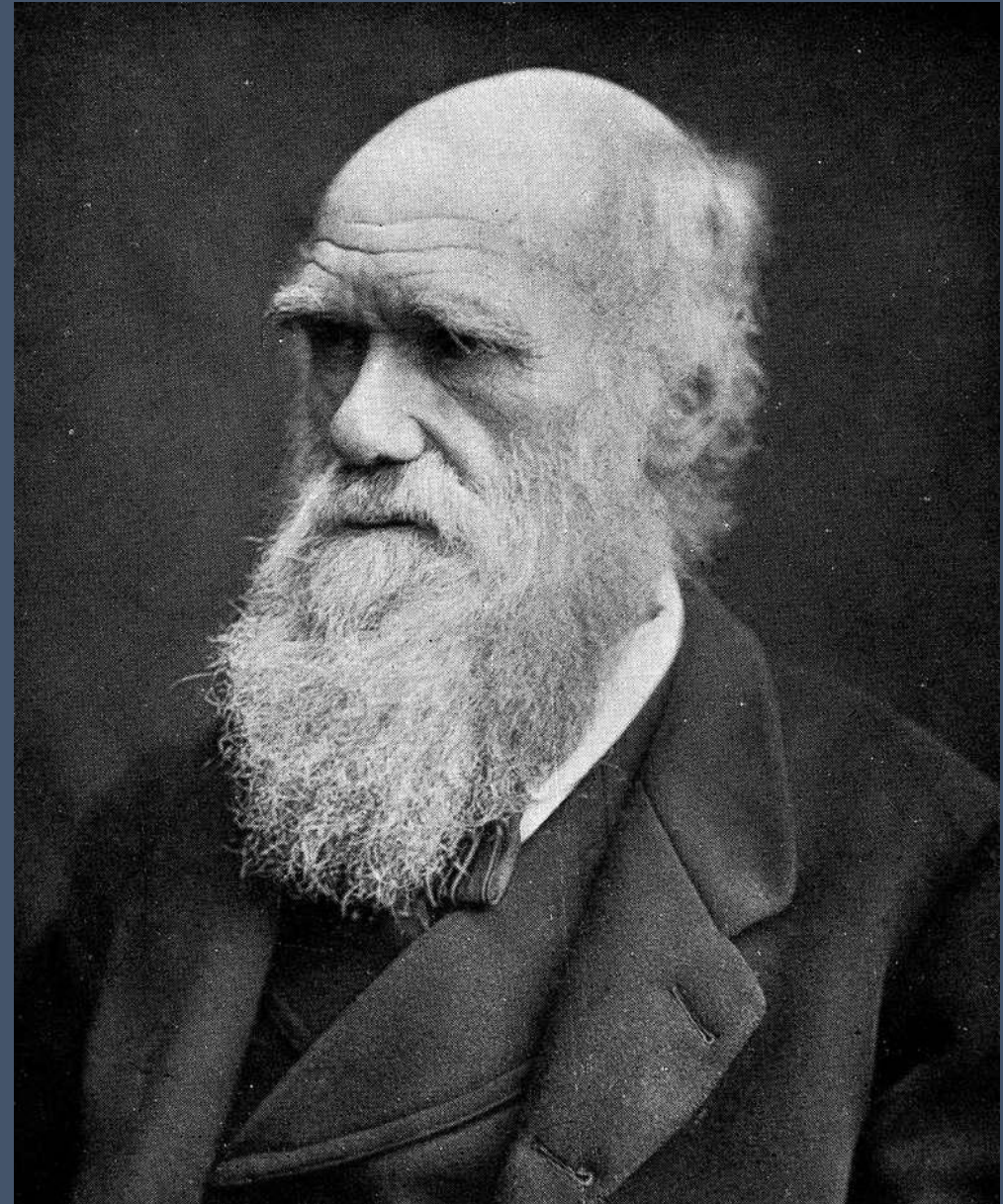
Reflections on ecosystem service classification for the SEEA-EEA

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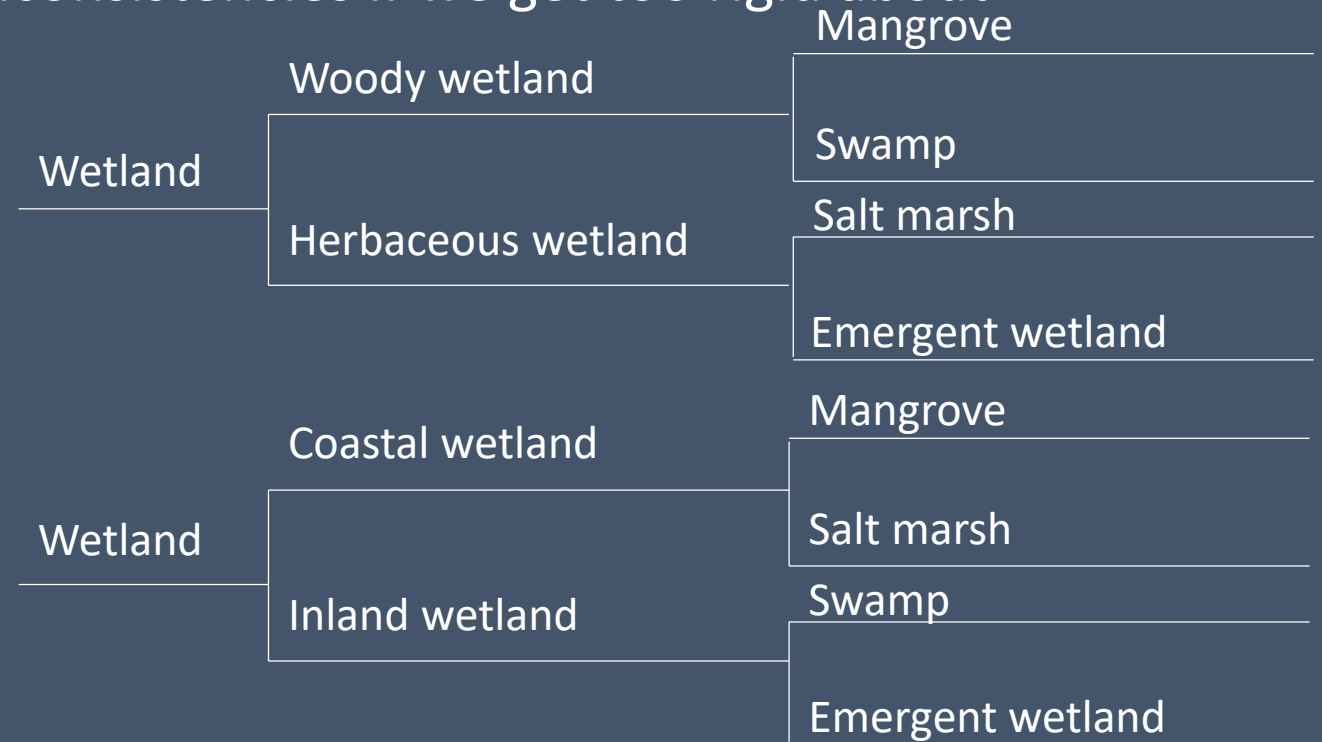
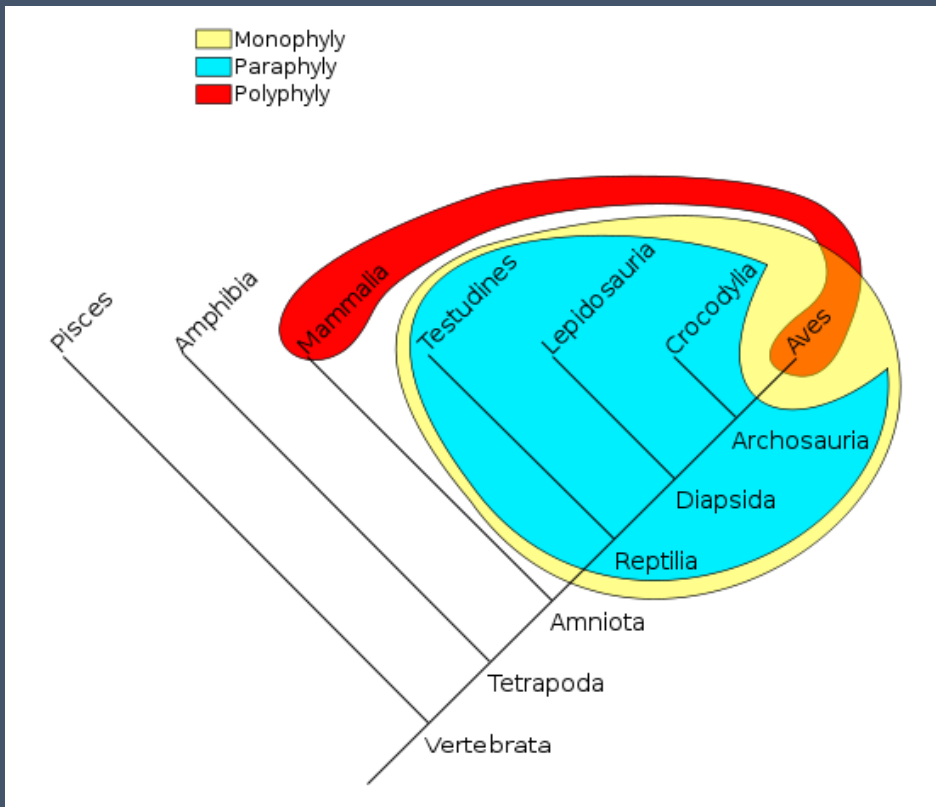
Hierarchy & classification

- 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.?

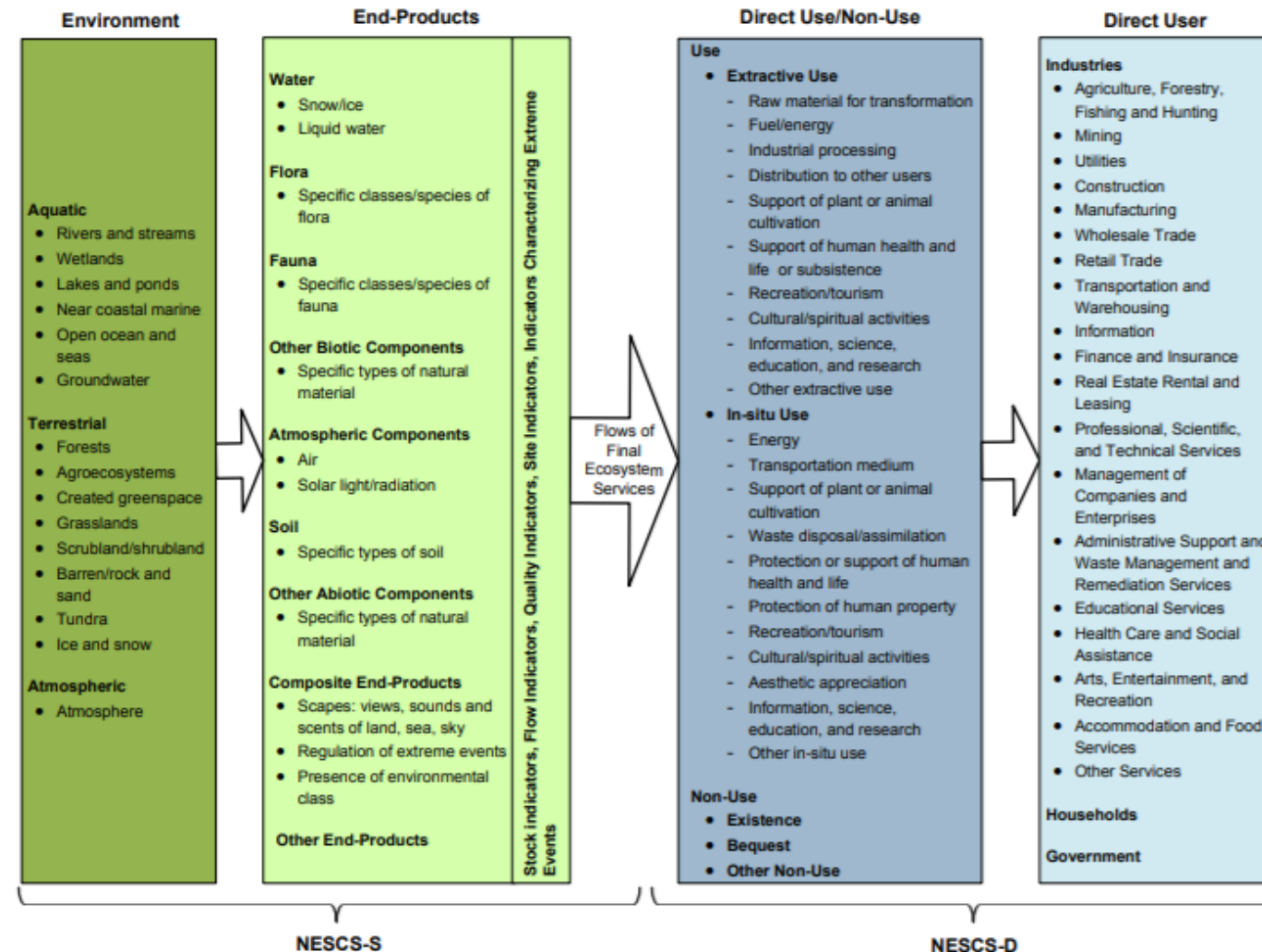
Provides all the row/ column headings that we need (industries, ecosystems, ecosystem services)

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 its existence |

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?