

On behalf of the **Potomac Environmental Research and Education Center (PEREC)** at **George Mason University**,

Dr. Dann Sklarew presents:

Biotic invasion and assimilation in the tidal freshwater Potomac River



Tidal Freshwater Potomac River (DC to Occoquan)

As urban aquatic ecosystem, it may –

- support valued wildlife (fish, birds) & food
- remove pollution & harmful microbes

BUT “healthy” ecosystem’s services –

- sensitive to Δ water I/O, temp., chem.
- vulnerable to pollution & “alien invasion”

Aliens invading Potomac River since early 1900s



Aquatic plants

Invasive water plant poised to overwhelm Potomac watershed

Jeremy Cox Jul 27, 2020 Updated Nov 12, 2020 0



Shellfish

The Asiatic Clam (*Corbicula fluminea*) Invasion and System-Level Ecological Change in the Potomac River Estuary near Washington, D. C.

Harriette L. Phelps

Estuaries, Vol. 17, No. 3 (Sep., 1994), pp. 614-621 (8 pages)



Fintfish



April 4, 2024

Blue Catfish Are Spreading Rapidly in Maryland Waters,



Etc.

CNN 1:57 PM EDT, Sun September 15, 2024

immigrants eating pets

▶

"Today's invader is tomorrow's neighbor."



Plant Invaders



Graves Lovell, AL DCNR

Eurasian Water Milfoil
(*M. spicatum*, 1940s+)



David J. Moorhead, UGA

Hydrilla verticillate.
(1982+)



Bay Journal

Water Chestnuts
(*T. natans*, 1923 to 1950s?;
T. bispinosa 1990s+)



Plant Neighbors



Threats to Potomac

1. Overshade native aquatic plants
2. Impede aquatic recreation
3. Decay → hypoxic benthos



Prospects for Potomac

1. Settle and stabilize barren shallows
2. Offer hideout habitat for fish fry, etc.
3. Increase volume for mineralizing N (anaerobic denitrification)



Shellfish Invaders



Asian Clam
(*C. fluminea*, 1977+)



Mystery Snail
(*Bellamya/Heterogen*,
1960s+)



Zebra Mussel
(*D. polymorpha*, 2002-2008)
@ Millbrook Quarry, VA



Shellfish Neighbors



Threats to Potomac

1. Outcompete native shellfish
2. Proliferate (if no local predators)
3. Jam boat motors & water intakes



Prospects for Potomac

1. Filter algae, organic & toxic pollutants
2. Improve habitat for aquatic plants
3. Provide food for some sports fish



Fish Invaders



Largemouth Bass
(*M. spicatum*, 1876+)



Catfish, Blue Catfish
(*I. Furcatus*, late 1980s+)



Northern Snakehead
(*C. argus*, early 2000s+)



Fish Neighbors



Threats to Potomac

1. Outcompete natives for food & habitat
2. Consume dwindling & threatened species
3. Disperse migrant mussels & clams



Prospects for Potomac

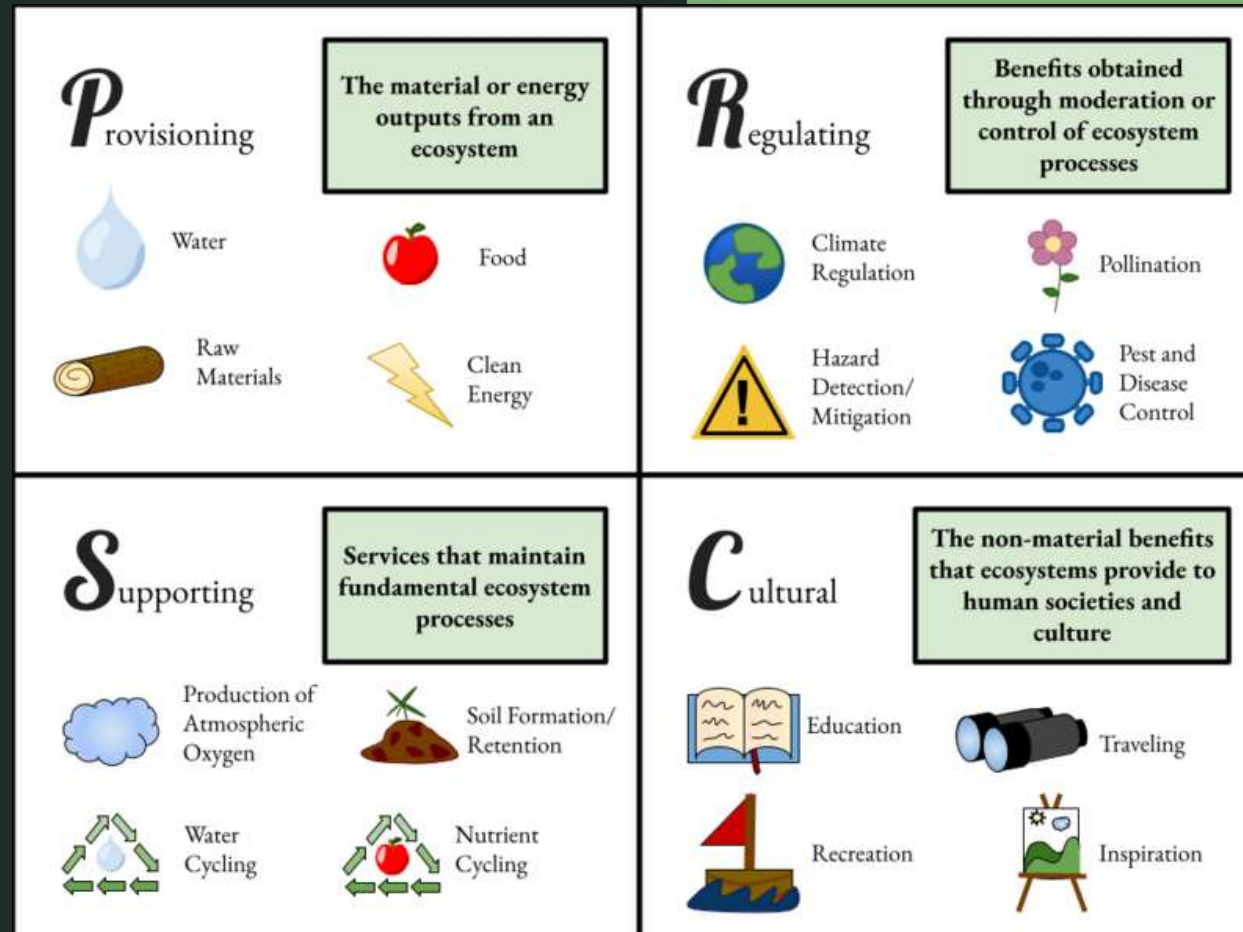
1. Food & jobs for riparian communities
 2. Bioaccumulation of consumed toxins
 3. Attraction for recreation, sport & nature visits
- + Prey for raptors & downstream dolphins?

Most of these
migrants still live in
the TF Potomac...
as our neighbors.

∴ Time to
look beyond
costly
species-
specific
control &
removal.

Integrated Management of a Cosmopolitan Potomac River

1. Promote wildlife making top Ecosystem Services



Integrated Management of a Cosmopolitan Potomac River

1. Promote wildlife making top Ecosystem Services
2. Pursue “aquatic permaculture,” self-sustaining ecological community of old & new neighbors



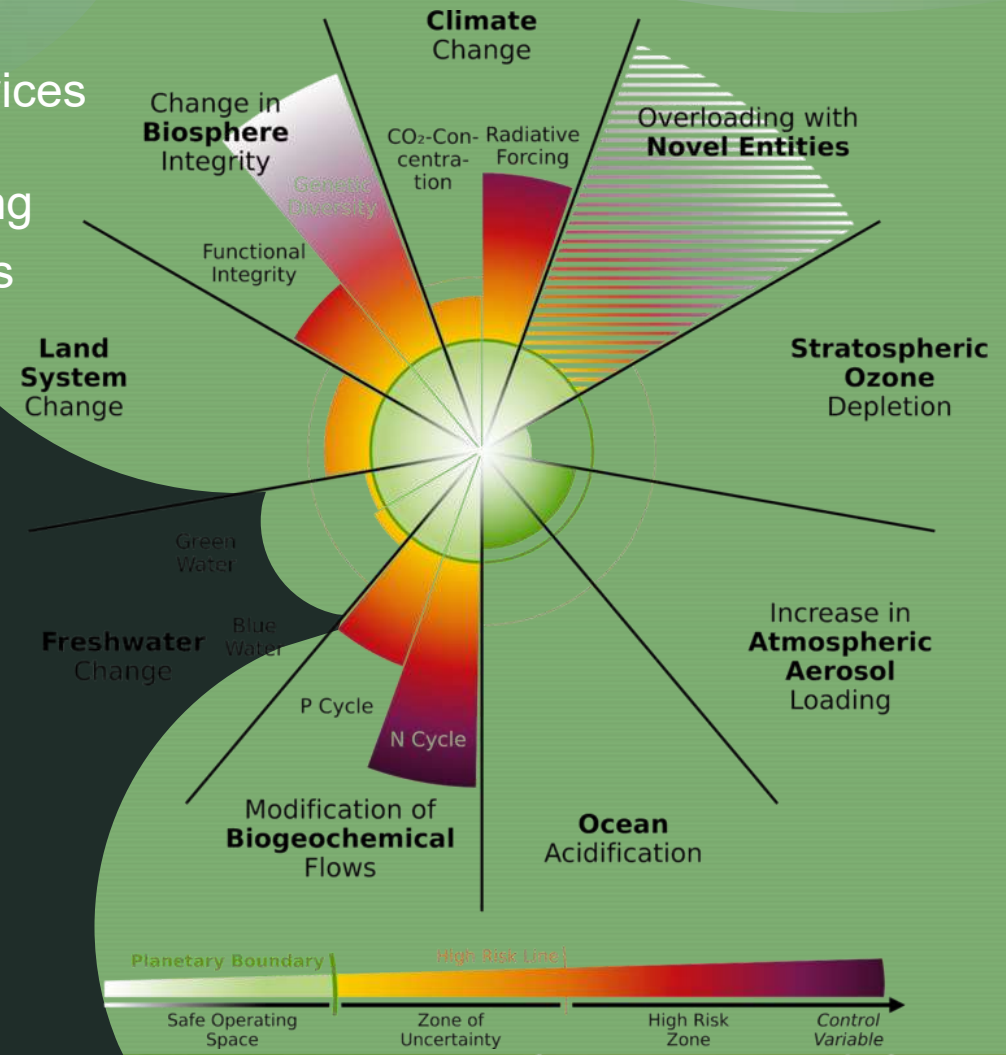


Integrated Management of a Cosmopolitan Potomac River

1. Promote wildlife making top Ecosystem Services
2. Pursue “aquatic permaculture,” self-sustaining ecological community of old & new neighbors
3. Prepare for more disruptive environmental change
 - Δ water I/O, chemistry & temperature
 - Pollution & new “alien invasion”

Integrated Management of a Cosmopolitan Potomac River

1. Promote wildlife making top Ecosystem Services
2. Pursue “aquatic permaculture,” self-sustaining ecological community of old & new neighbors
3. Prepare for disruptive environmental change
4. Be mindful of planetary boundaries



Integrated Management of a Cosmopolitan Potomac River

1. Promote wildlife making top Ecosystem Services
2. Pursue “aquatic permaculture,” self-sustaining ecological community of old & new neighbors
3. Prepare for disruptive environmental change
4. Be mindful of planetary boundaries
5. Make it appealing to human neighbors too!

**E,g., Maryland wants invasive fish out of the water — and on your dinner table
As northern snakehead and blue catfish continue to proliferate,
the state is trying to get more people to eat’em. Integrative ideas?**



Eat the Potomac
An estuarine cookbook



Dann M. Sklarew

“malicious but delicious”
~ MD Dept. Ag.

▶

*"Today's invader is
tomorrow's neighbor."*

Thanks to PEREC Fellows:

Amy Fowler

Chris Jones

Reid Nelson

Rosalina Christova

and Mason alumnae partners:

Michelle Ryan

Nancy Rybicki