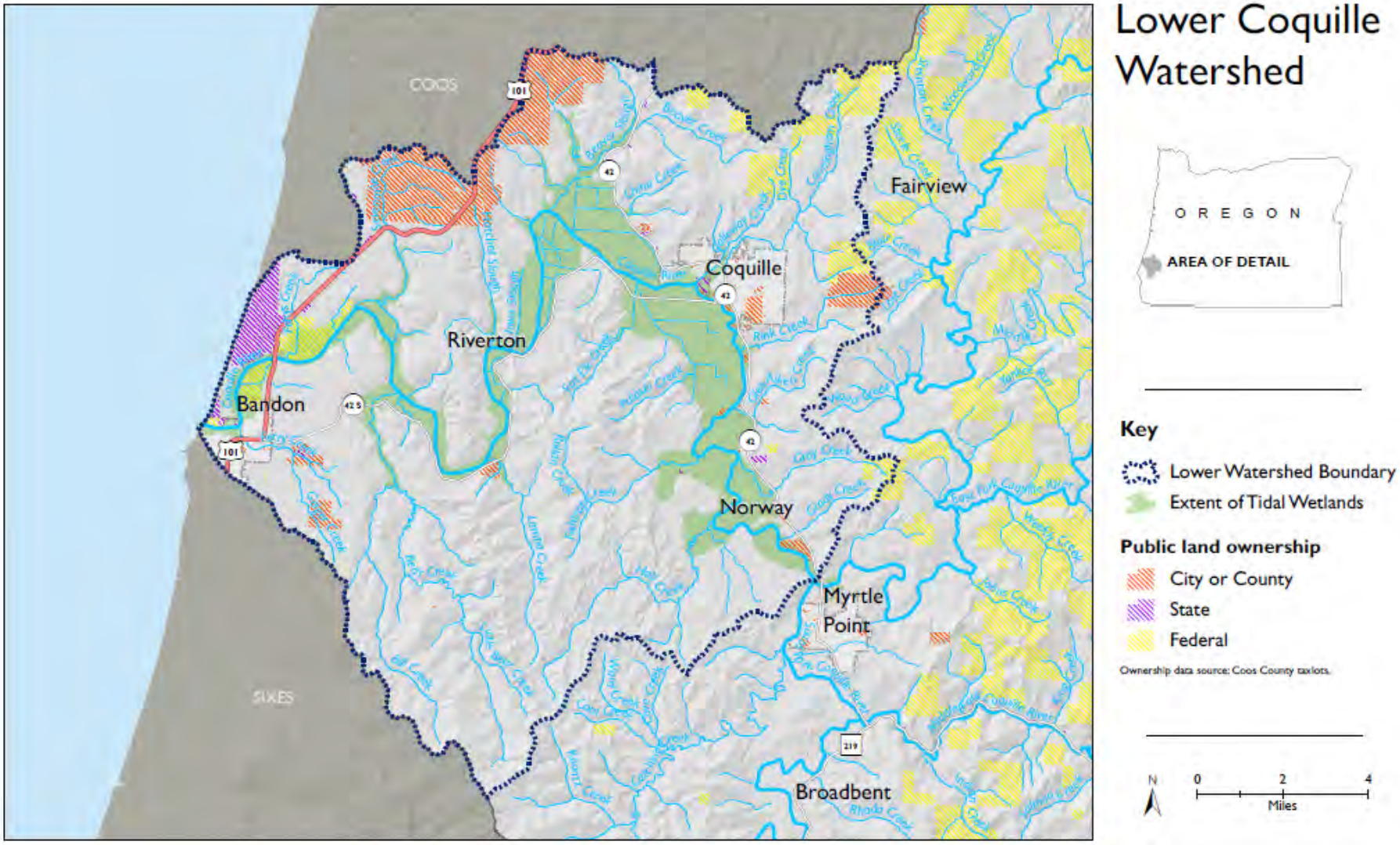
Lower Coquille Watershed



c. USFWS

Lower Coquille Watershed

- Tidal dominated drowned river mouth estuary
  - large drainage area
  - predominantly freshwater input
  - Medium/large estuary area
  - many dikes
- Estuary size: 17425 ac overall; 825 ac undiked

c. Aldous@TNC

Lower Coquille Watershed

Google Maps

Natural Habitats

Photo by ODFW

Natural Habitats

Estuarine

- Mudflats
- Saltmarsh
- Scrub-shrub marsh
- Spruce swamp
- Subtidal
- Eelgrass

Aquatic

- Subtidal—bay and sloughs
- Tidal channels
- Low gradient streams
- Low gradient mainstem

Other: sand spit and dune

Native Species

c.Rick McEwan

Native Species

Anadromous Fish

Coho

Winter Chinook

Spring Chinook

Chum

Steelhead

Cutthroat trout

Pacific lamprey

Amphibians Mammals

Invertebrates

Shorebirds & Waterfowl

Western sandpiper

Dunlin

Least sandpiper

Semi-palmated plover

American widgeon

Northern pintail

Green-winged teal

Passerines Seabirds

Ecological Processes

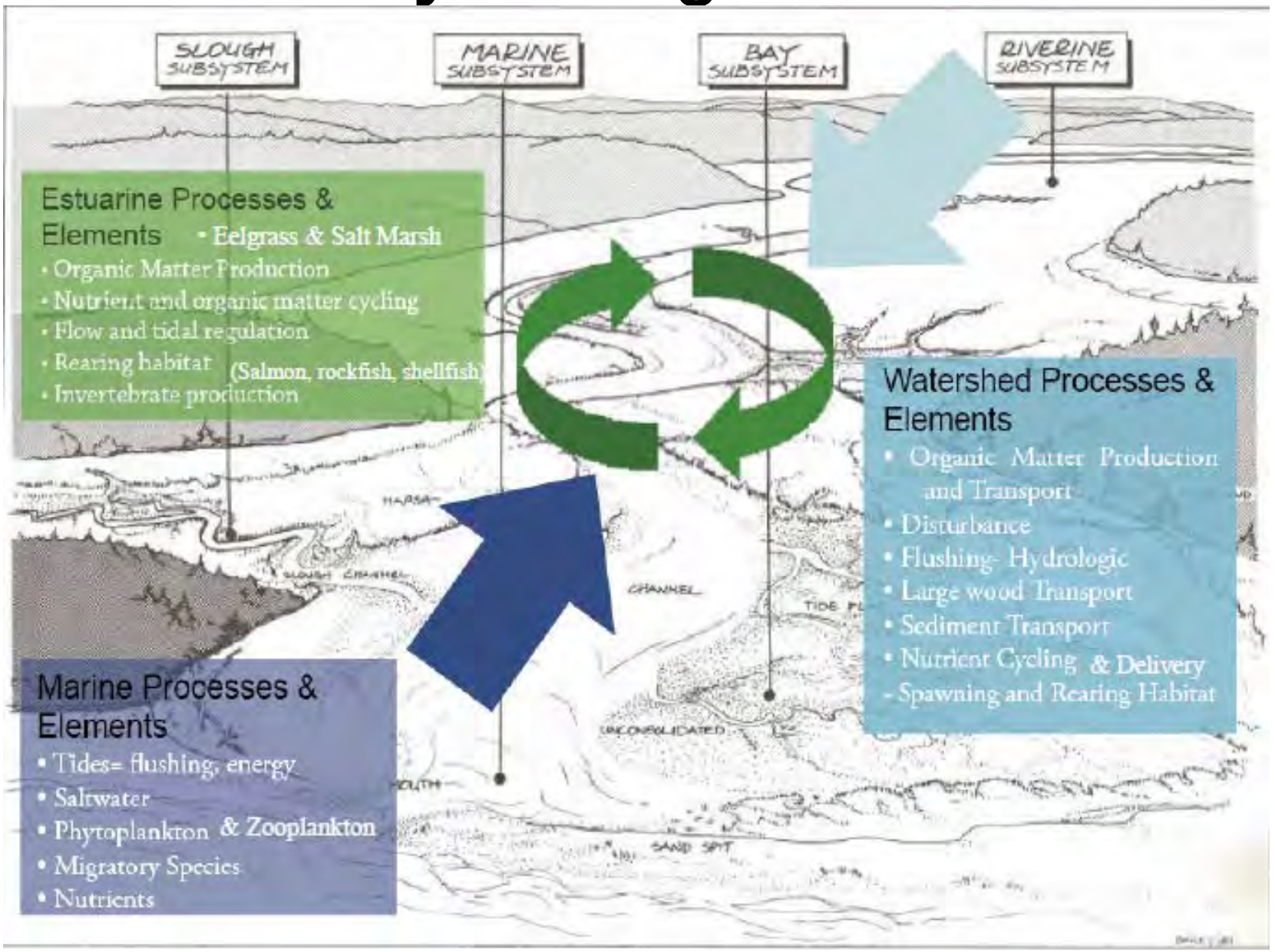
Photo by ODFW

Estuarine Processes

Determine the distribution, abundance, and viability of species and ecosystems.

1. Circulation (freshwater + marine)
2. Sediment transport and deposition
3. Nutrient cycling

Estuary Ecological Model



Oregon Department of Land Conservation and Development 1987

Schematic of Estuarine Circulation

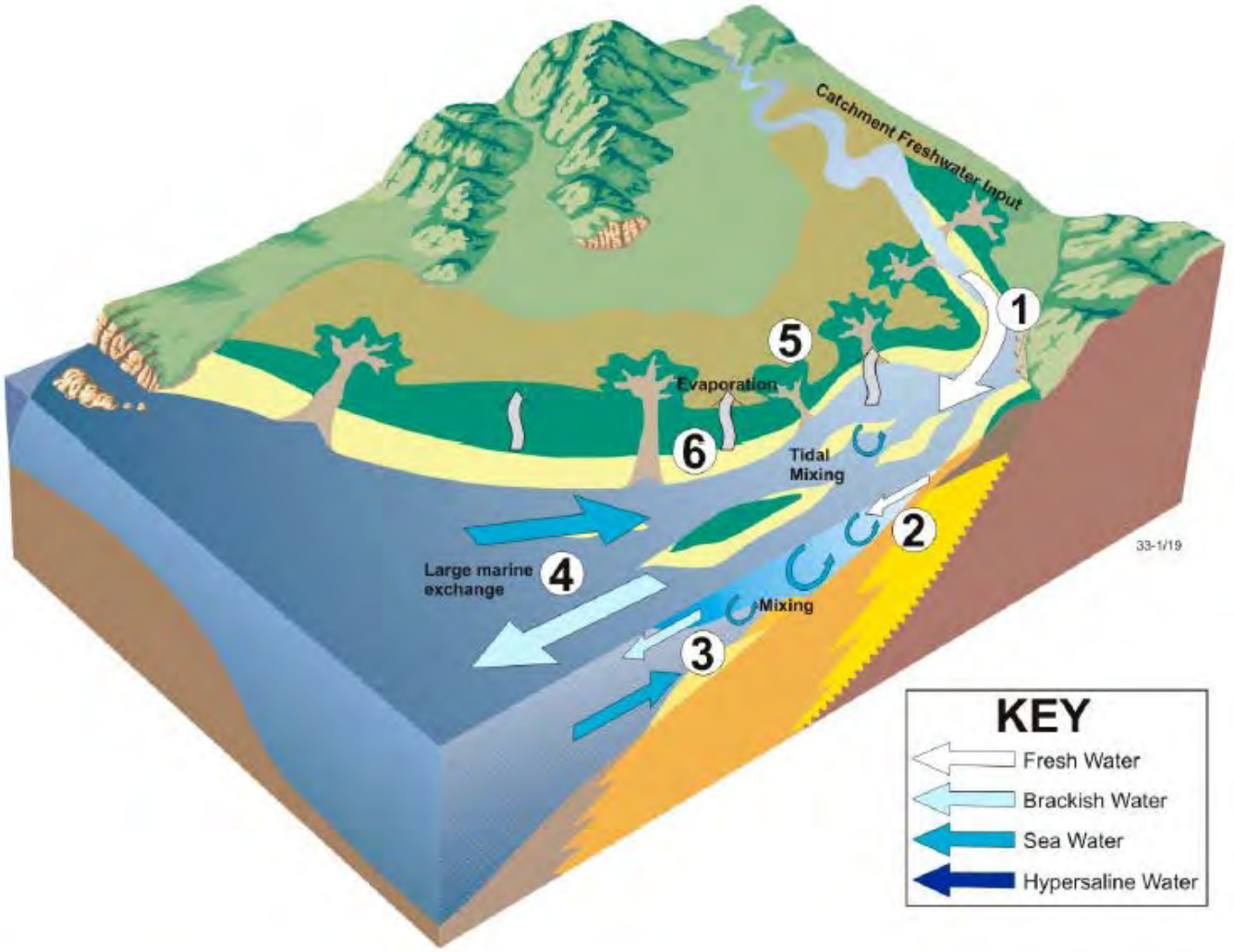
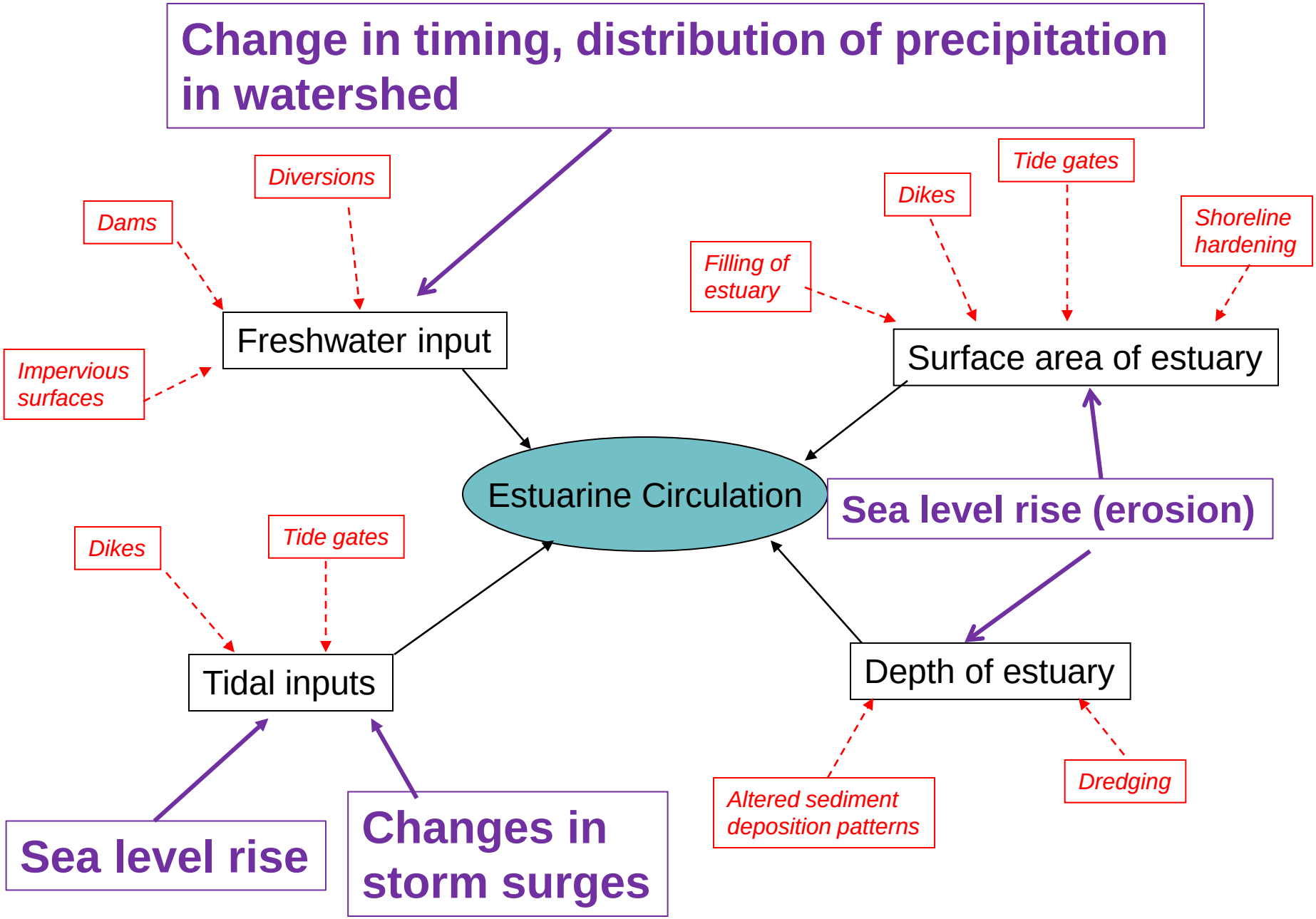


Figure 24 – Conceptual model of major hydrodynamics (positive) in a tide-dominated estuary.

Ryan et al., 2003



Aldous, et al., 2008

Schematic of sediment transport & deposition

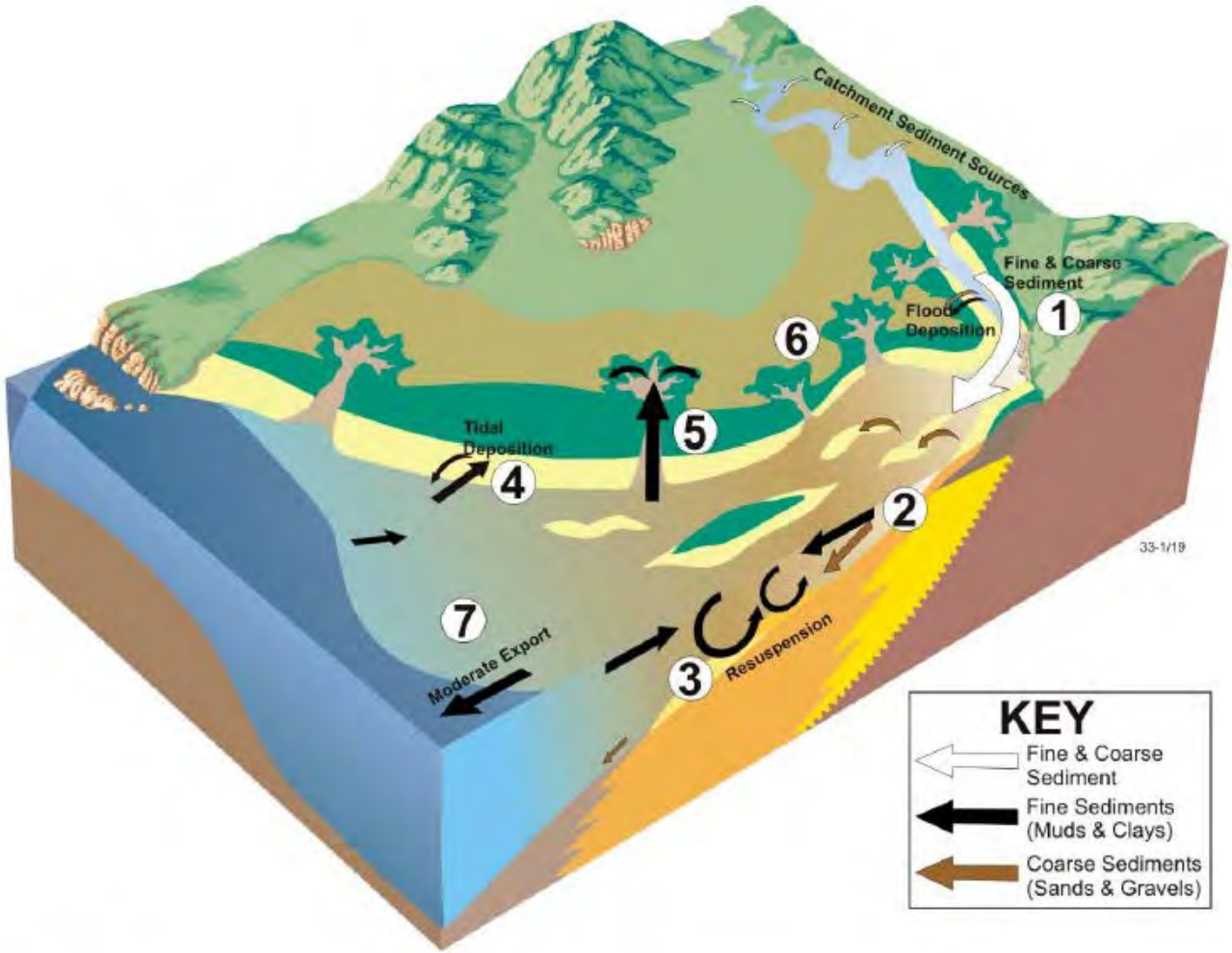
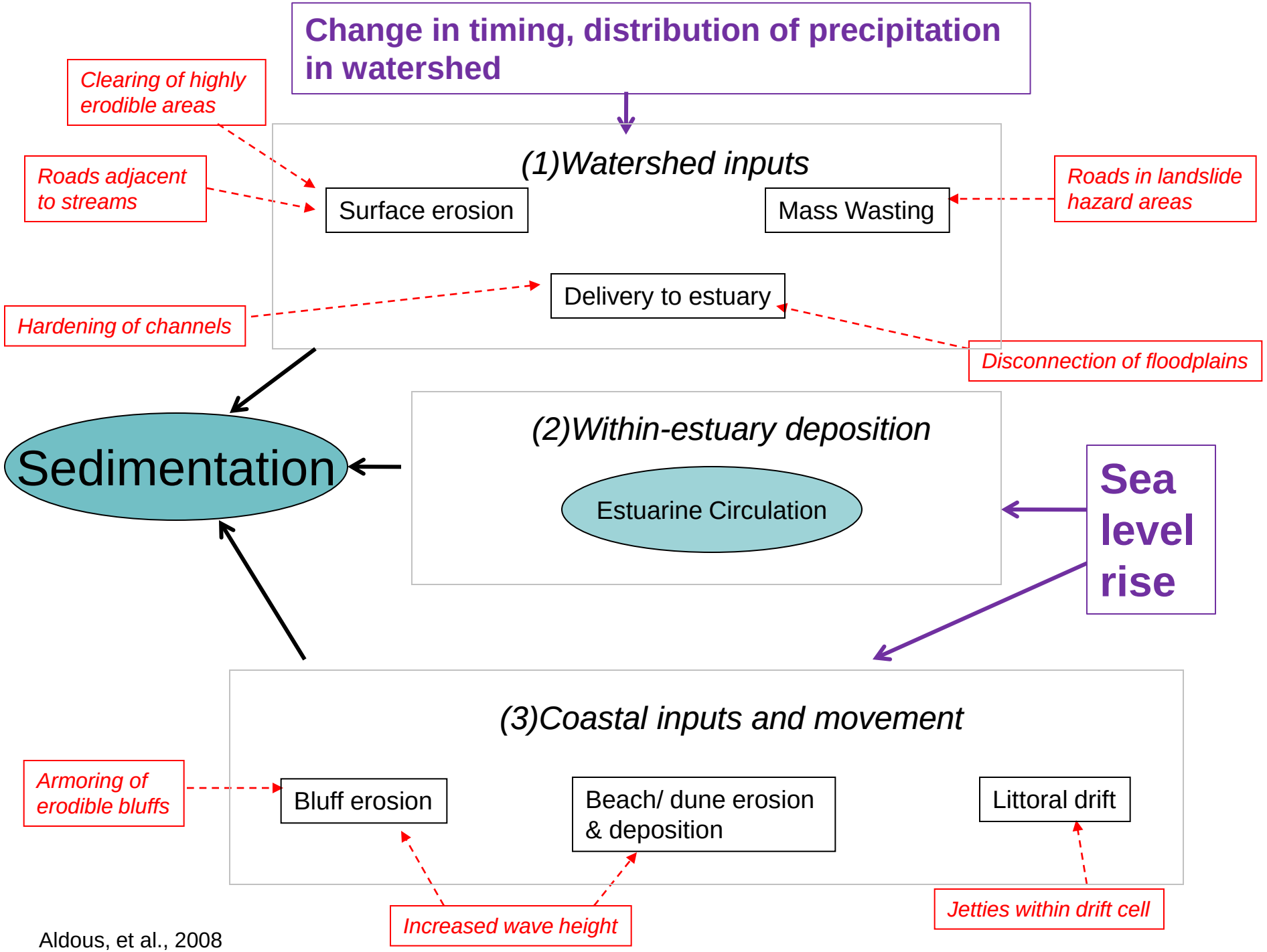


Figure 26 – Conceptual model of major sediment dynamics in a tide-dominated estuary.

Ryan et al., 2003



Aldous, et al., 2008

Schematic of nutrient cycling

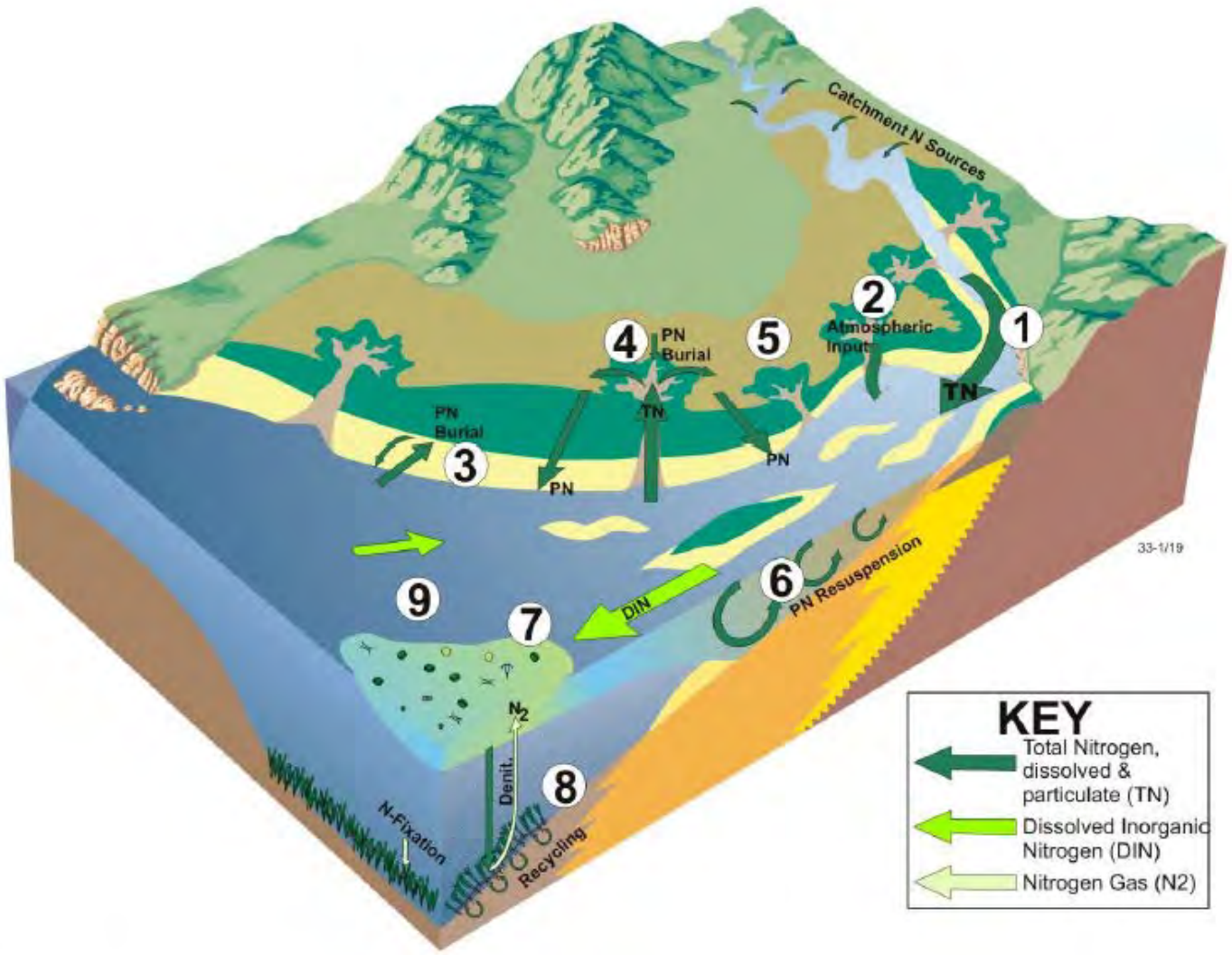
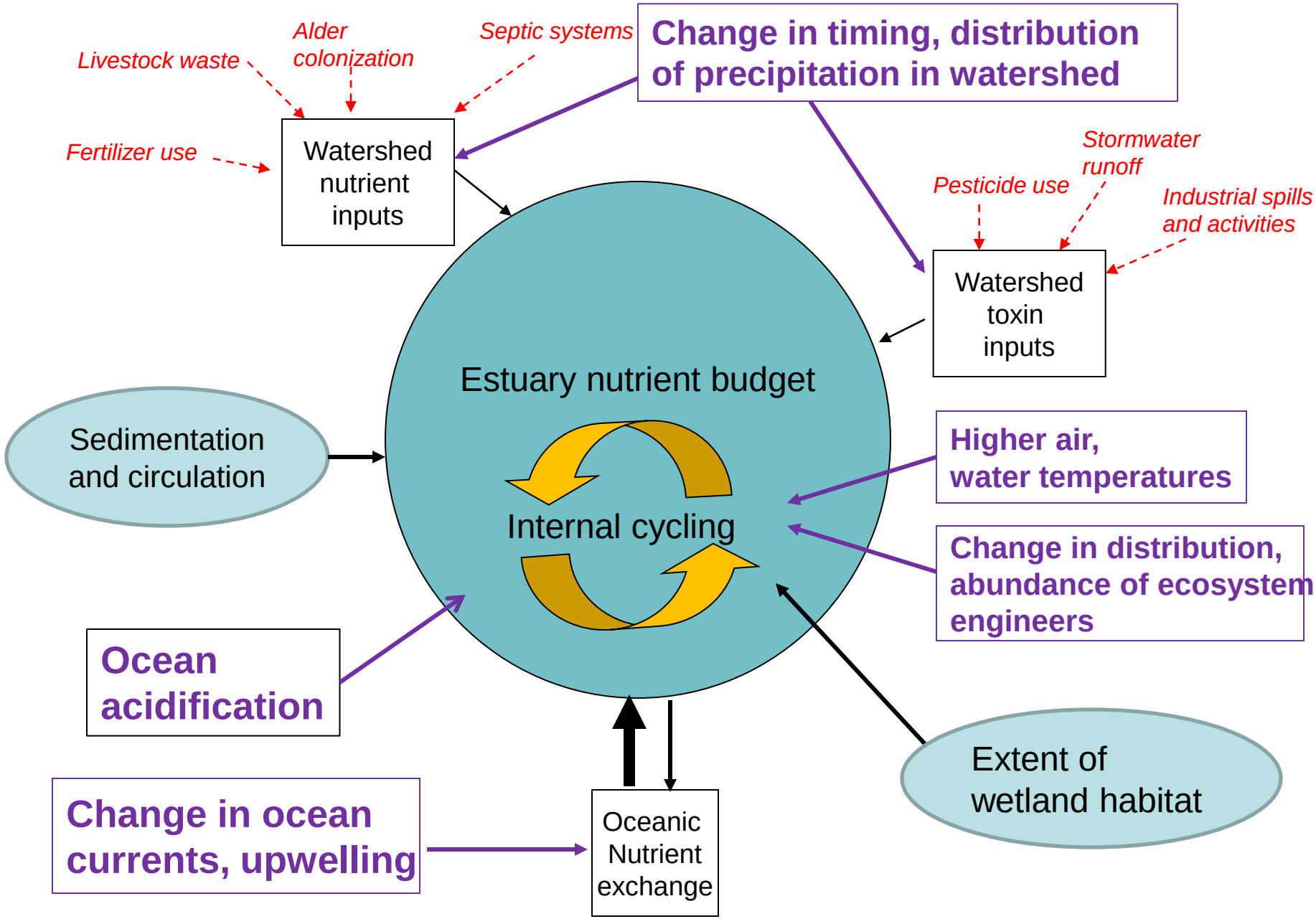


Figure 27 – Conceptual model of major nutrient (nitrogen) dynamics in a tide-dominated estuary.

Ryan et al., 2003



Aldous, et al., 2008

Summary: Ecological Processes and Climate Change Impacts

- **Circulation** Change in timing, distribution of precipitation in watershed; Sea level rise (tidal inputs, erosion); Storm surge
- **Sedimentation** Change in timing, distribution of precipitation in watershed; Sea level rise
- **Nutrient Cycling** Change in timing, distribution of precipitation in watershed; Higher air, water temperatures; Change in distribution, abundance of ecosystem engineers; Changes in ocean currents, upwelling; Ocean acidification

Questions for Wildlife/Fish Managers

- How will CC impacts directly affect species and habitats?
- How will CC impacts affect food webs (plants, invertebrates) that drive systems?
- Consider secondary CC impacts, such as estuary salt wedge location, non-target species changes, changes in land use, others?
- What do you know from experience with “odd” years in terms of ecosystem responses?

References

- Aldous, A., Brown, J., Elseroad, A., Bauer, J. 2008. The Coastal Connection: assessing Oregon estuaries for conservation planning. The Nature Conservancy. Portland, Oregon.
- Ryan, D. A., Heap, A. D., Radke, L., and Heggie, D. T., (2003) *Conceptual models of Australia's estuaries and coastal waterways: applications for coastal resource management. Geoscience Australia, Record 2003/09, 136 pp.*

c. Aldous@TNC