**Wetlands and Bioaccumulation**

**Wetlands: what are they?**

**Questions/Pictures/ Key Words**

*•For regulatory purposes under the Clean Water Act, the term wetlands means "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.*

*•Wetlands generally* include:

– swamps, marshes, bogs and similar areas."

**•Wetlands – lands covered with water all or part of a year**

• **Hydric (saturated) soils** – saturated long enough to create an anaerobic state in the soil horizon

• **Hydrophytic plants** – adapted to thrive in wetlands despite the stresses of an anaerobic and flooded environment

• **Hydrologic regime** – dynamic or dominant presence of water

 •May be fresh or brackish (fresh and salt combo)

**Functions**

Physical/Hydrological **Functions** of Wetlands

•Flood Control

–Correlation between wetland loss and downstream flooding

–Can capture, store, and slowly release water over a period of time

•Coastal Protection

–Serve as storm buffers

•Ground Water Recharge

–Water has more time to percolate through the soil

•Sediment Traps

–Wetland plants help to remove sediment from flowing water

•Atmospheric Equilibrium

–Can act as ‘sinks’ for excess carbon and sulfur

–Can return N back to the atmosphere (denitrification)

Chemical **Functions** of Wetlands

•Pollution Interception

–Nutrient uptake by plants

–Settle in anaerobic soil and become reduced

–Processed by bacterial action

•Toxic Residue Processing

**Questions/Pictures/ Key Words**

–Buried and neutralized in soils, taken up by plants, reduced through ion exchange

–Large-scale / long-term additions can exceed a wetland’s capacity

–Some chemicals can become more dangerous in wetlands (Mercury)

**Methylmercury Bioaccumulation**

•Mercury is accumulated by fish, invertebrates, mammals, and aquatic plants.

•Methylmercury can accumulate quickly but depurates slowly, so it accumulates

–Also biomagnifies *(builds up in the food chain)*

•Percentage of methylmercury increases with organism’s age.

**What good are wetlands?**

•Help clean water by acting like a **filter**

–The plants and slow water flow in a wetland help remove pollutants, leaving water cleaner downstream in a lake or river.

–Too much pollution can leave a wetland toxic to visiting animals, such as many birds.

**Restoration & Mitigation**

•No-net loss of wetlands rule ~1989

–Developers must recreate wetlands they destroy in construction

•Are new wetlands really the same?

Daily Debbie Downer

•Estimated loss of 53% of total wetlands in U.S.

–9.2 million acres lost between 1950’s-1970’s

–2.6 million acres lost between 1970’2-1980’s

–current loss of 124,000 acres per year

**Summary:**