

# Biosolids and the Chesapeake Bay Watershed Model

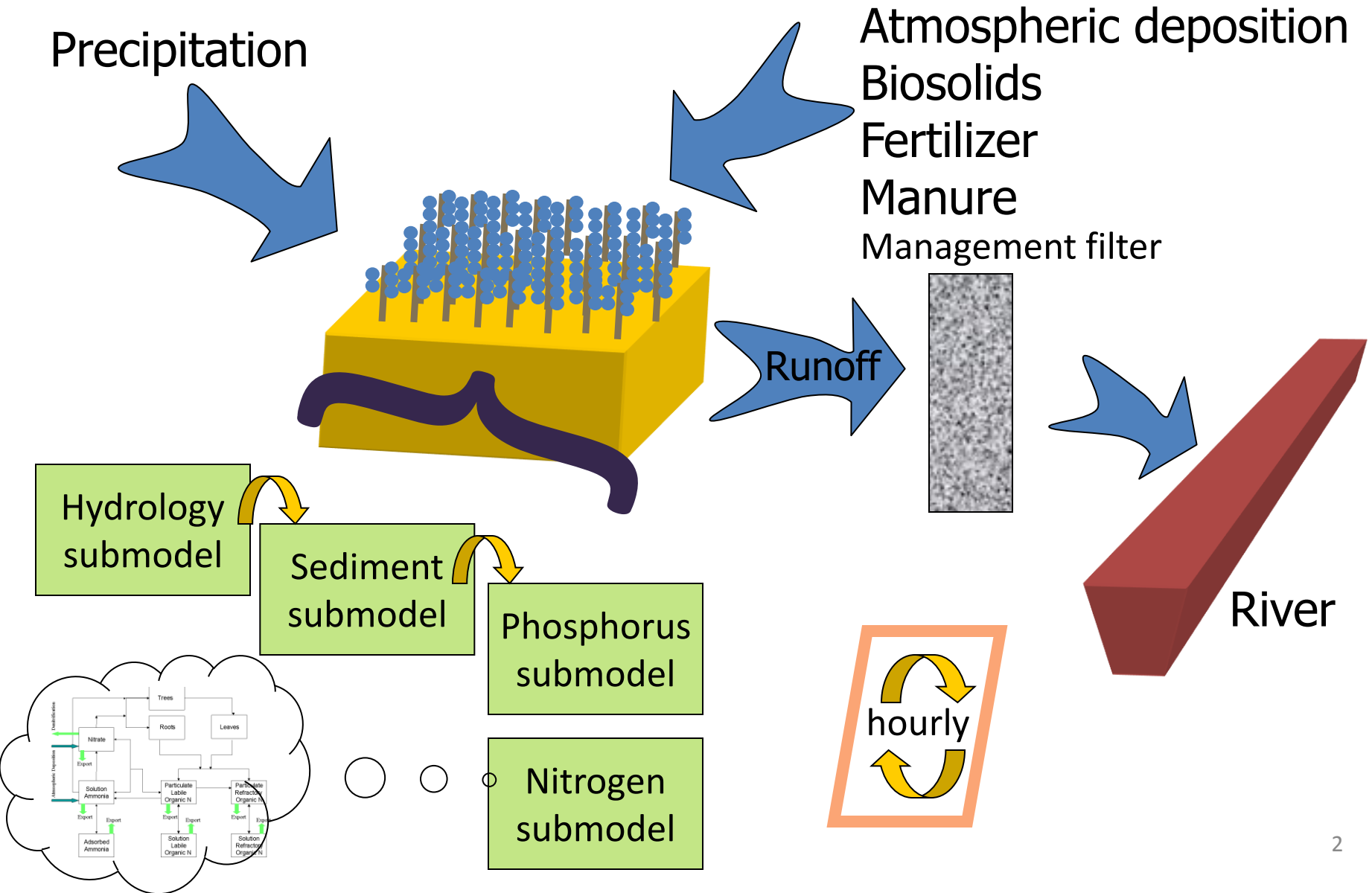
WWTWG 05062014

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# How the Watershed Model Works

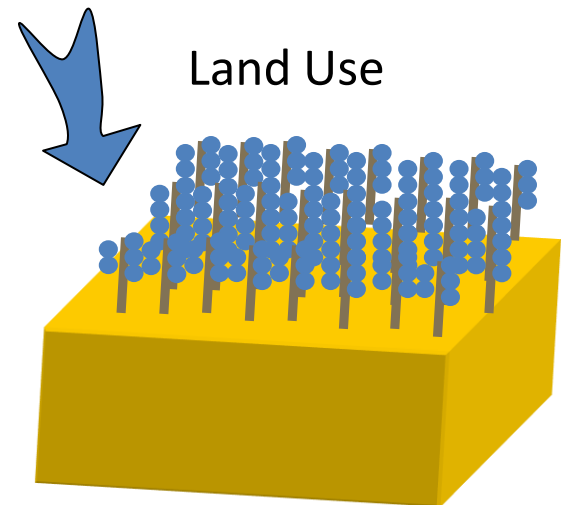


# Crop Simulation

For a hypothetical acre of **rye for grain** (not cover crop), Scenario Builder knows the following from information provided by the states, Agriculture Workgroup and the Ag Census:

Parameter	Data Provided
Plant Date	October 1
Yield Upper Limit	44.22 Bushels
Lower Limit	20.41 Bushels
Nitrogen Uptake	1.41 lbs/Bushel
Phosphorus Uptake	0.21 lbs/Bushel
Nitrogen Application Date 1	Plant Date – 20 days
Nitrogen App Amount 1	25% of Need
Nitrogen Application Date 2	Plant Date + 150 days
Nitrogen App Amount 2	75% of Need
Phosphorus Application Date 1	Plant Date – 20 days
Phosphorus App Amount 1	100% of Need
Harvest Date	June 1 (or April 1)

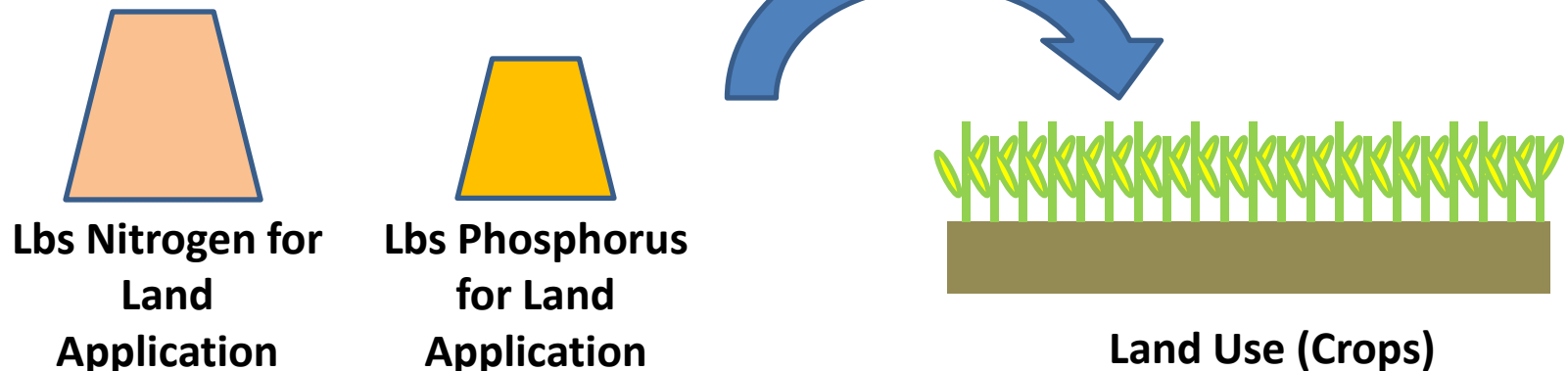
Sources:  
Atmospheric deposition  
Biosolids  
Fertilizer  
Manure



# Order of Nutrient Application

- Order by Nutrient Source

- 1) Starter Fertilizer (States determined some applications must be made by inorganic fertilizer and not manure and biosolids)
- 2) Direct deposition
- ~~3) Biosolids~~
- 4) CAFO manure
- 5) AFO manure
- 6) Fertilizer (to supplement remaining need)
- 7) Disposal sequence



# Biosolids Reporting

- VA reported biosolids from 1985 through 2010.
- Model applies VA's biosolids to agricultural lands to fulfill crops' needs.
- No other jurisdiction's crops receive biosolids in the Watershed Model.

# Biosolids Nutrient Concentrations

- Mineralizable N: 0.0096 lbs/lb
  - Mineralizable P: 0.0125 lbs/lb
  - Organic N: 0.0224 lbs/lb
  - Organic P: 0.0125 lbs/lb
  - NO<sub>3</sub>: 0.0005 lbs/lb
  - Ammonia: 0.0065
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- These are current model assumptions, but better data would inform these numbers for Phase 6.

# AMS and Agriculture Workgroup

- Agricultural Modeling Subcommittee and the Agriculture Workgroup were tasked with refining nutrient inputs for the Phase 6 Model to agricultural lands.
- Groups have collected fertilizer and manure information for Phase 6, but not biosolids.

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