

**Wetlands**



**and**



**CBM**

## **Integrated Science--**

### **Coalbed Methane and Wetlands Research**

- ❖ Overview of the CBM proposal**
- ❖ Team activities and accomplishments**
- ❖ Future directions in CBM research**

# **PROJECT: Developing Integrated Modelling Methods for Assessing the Effects of Coalbed Methane on Emergent Wetlands.**

*From the Proposal... "We will develop a conceptual model of how these wetlands function hydrologically, the importance of the wetland area to waterfowl and waterbirds, and the extent to which the wetland is likely to be impacted by CBM development. Finally, we will publish a conceptual model of wetland function, providing stakeholders with a plan for further study. Results of this project will allow CBM development to be managed in a way that eliminates or reduces impacts to wetlands."*

Assembling the team...

## Writing the CBM proposal:

- ❖ **Vito Nuccio - GD, Team Leader**
- ❖ **John Kilpatrick - WRD**
- ❖ **Tim O'Neill - NMD**
- ❖ **Rick Sojda - BRD**

## The CBM field team:

- ❖ **Rick Sojda - BRD, Leader**
- ❖ **Mike Cannon – WRD**
- ❖ **Steve Custer – Geomorphology/Hydrology, MSU**
- ❖ **Lance Clampitt – NMD**
- ❖ **Jamie McBeth – NMD**
- ❖ **John Paxton – Computer Science, MSU**
- ❖ **Cyndi Rice - GD**

## **Thanks go especially to...**

- **Tom Pick, NRCS – aerial video**
- **Lynda Saul, Montana DEQ – NWI maps**
- **Jim Hanson, Tom Hinz, & Don Hyypa, Montana FW&P – migratory bird information**





NO







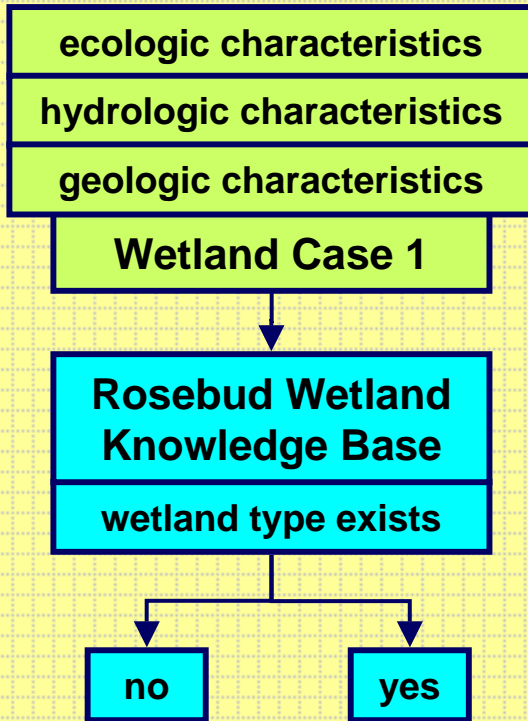




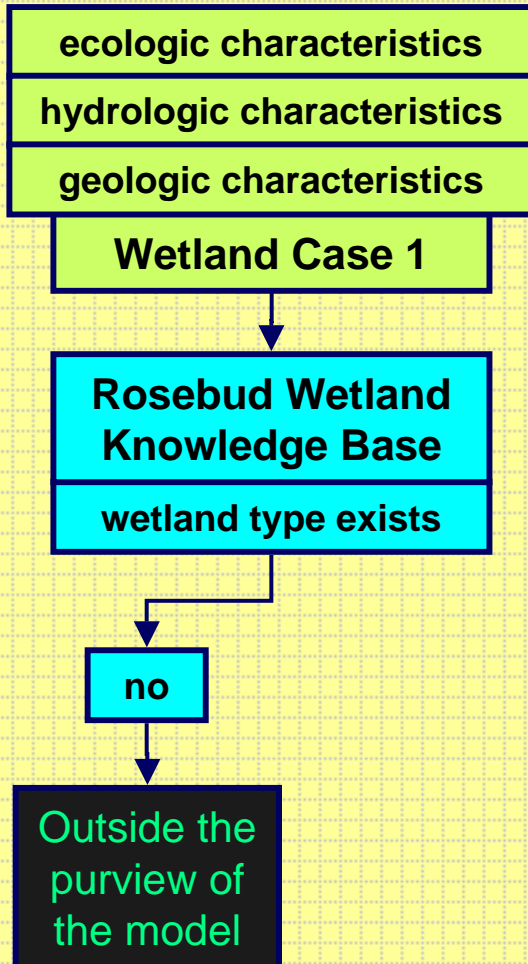




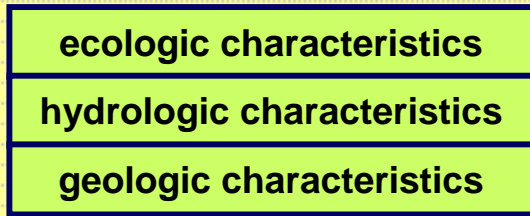
# Conceptual Model (High Level) to Predict the Effect of Coalbed Methane Production on Wetlands



# Conceptual Model (High Level) to Predict the Effect of Coalbed Methane Production on Wetlands

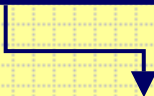
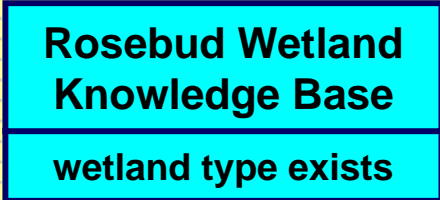


# Conceptual Model (High Level) to Predict the Effect of Coalbed Methane Production on Wetlands



**Coalbed Methane  
Potential Exists**

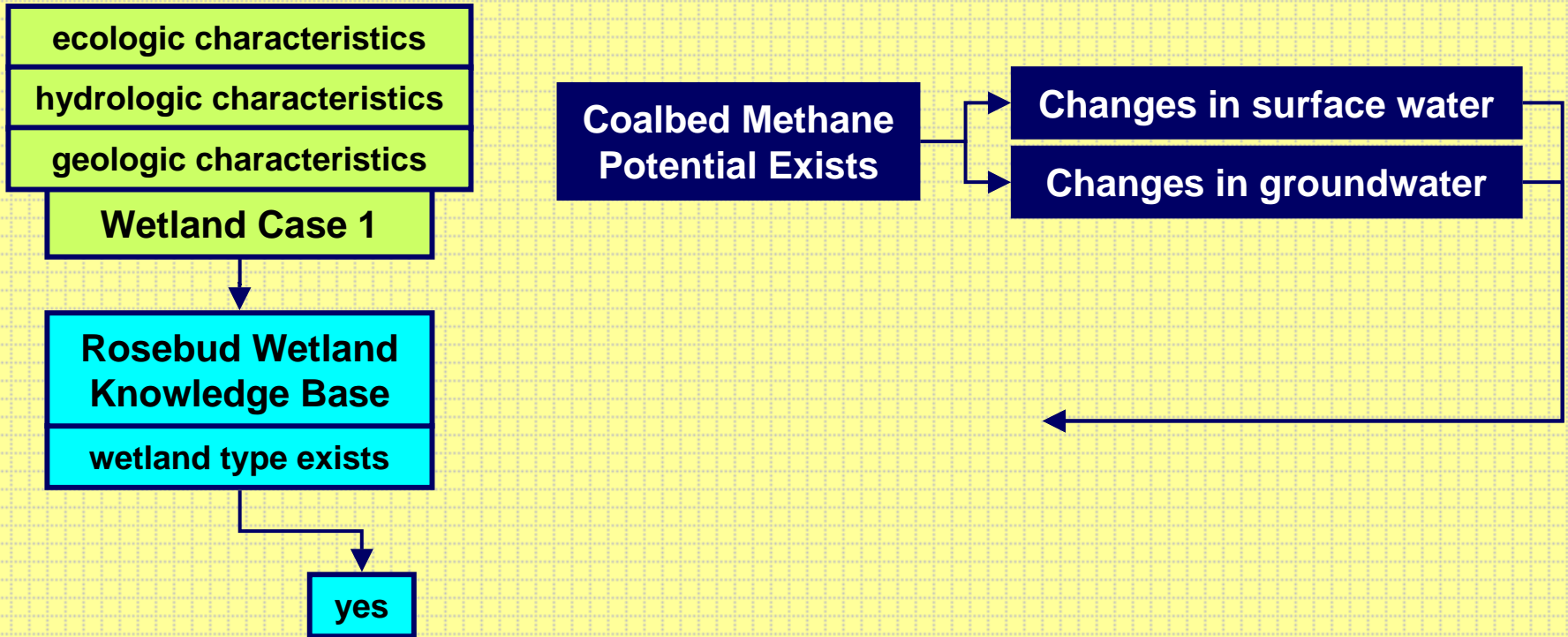
**Wetland Case 1**



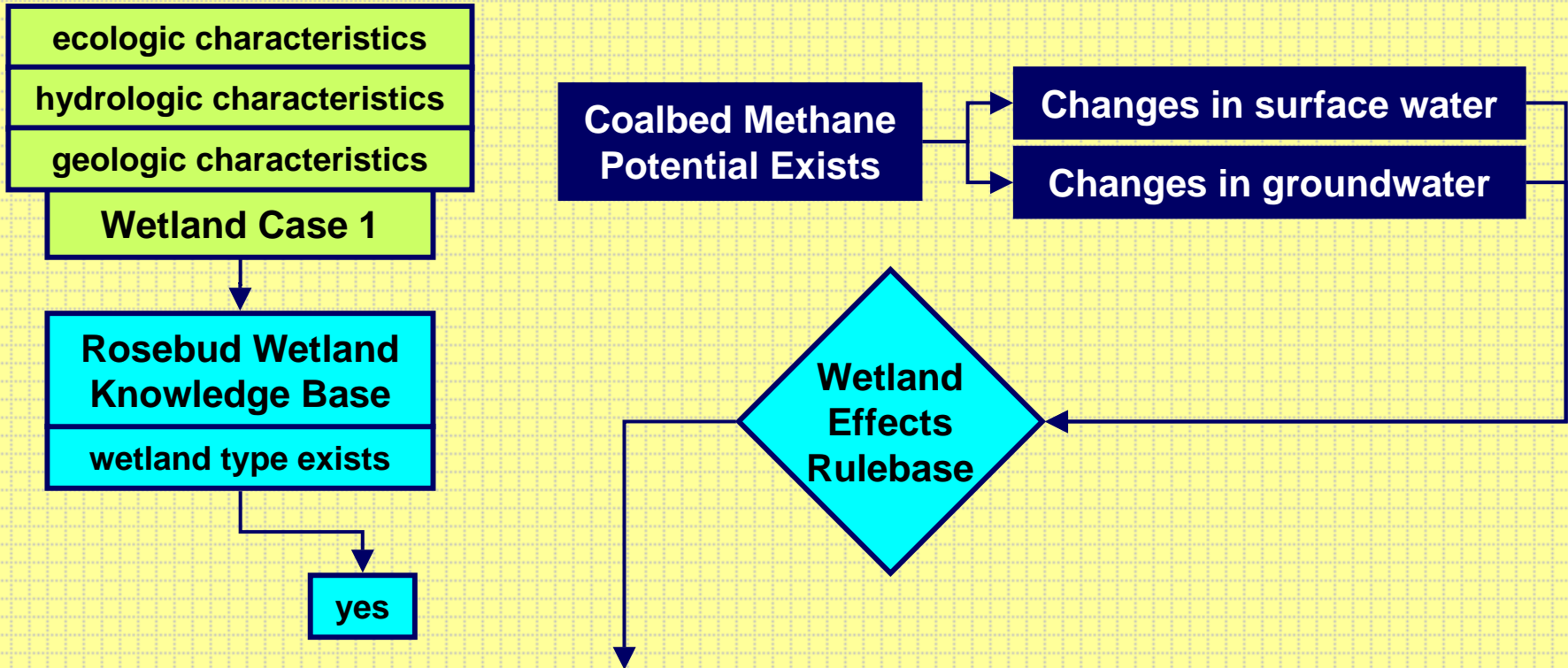
**yes**



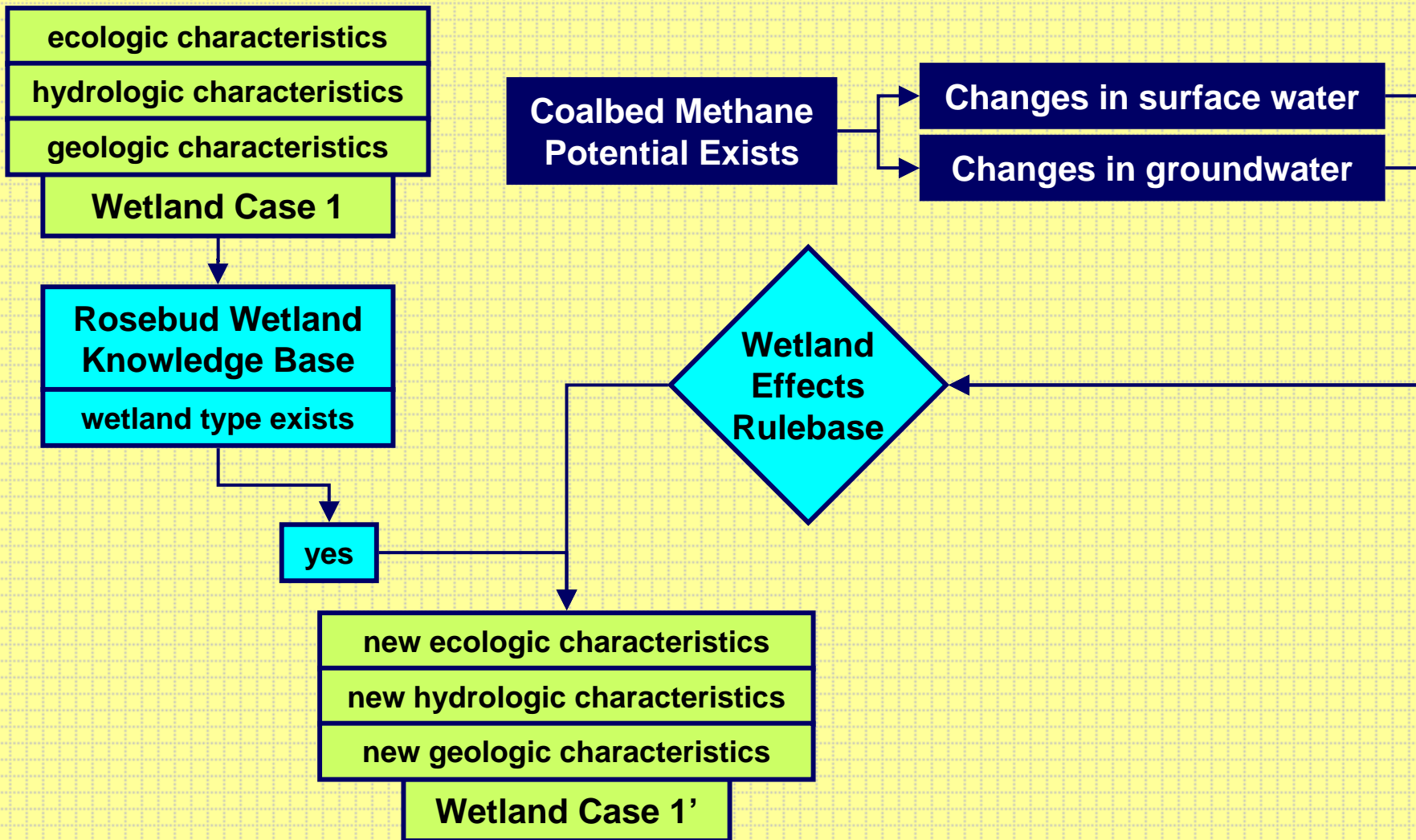
# Conceptual Model (High Level) to Predict the Effect of Coalbed Methane Production on Wetlands



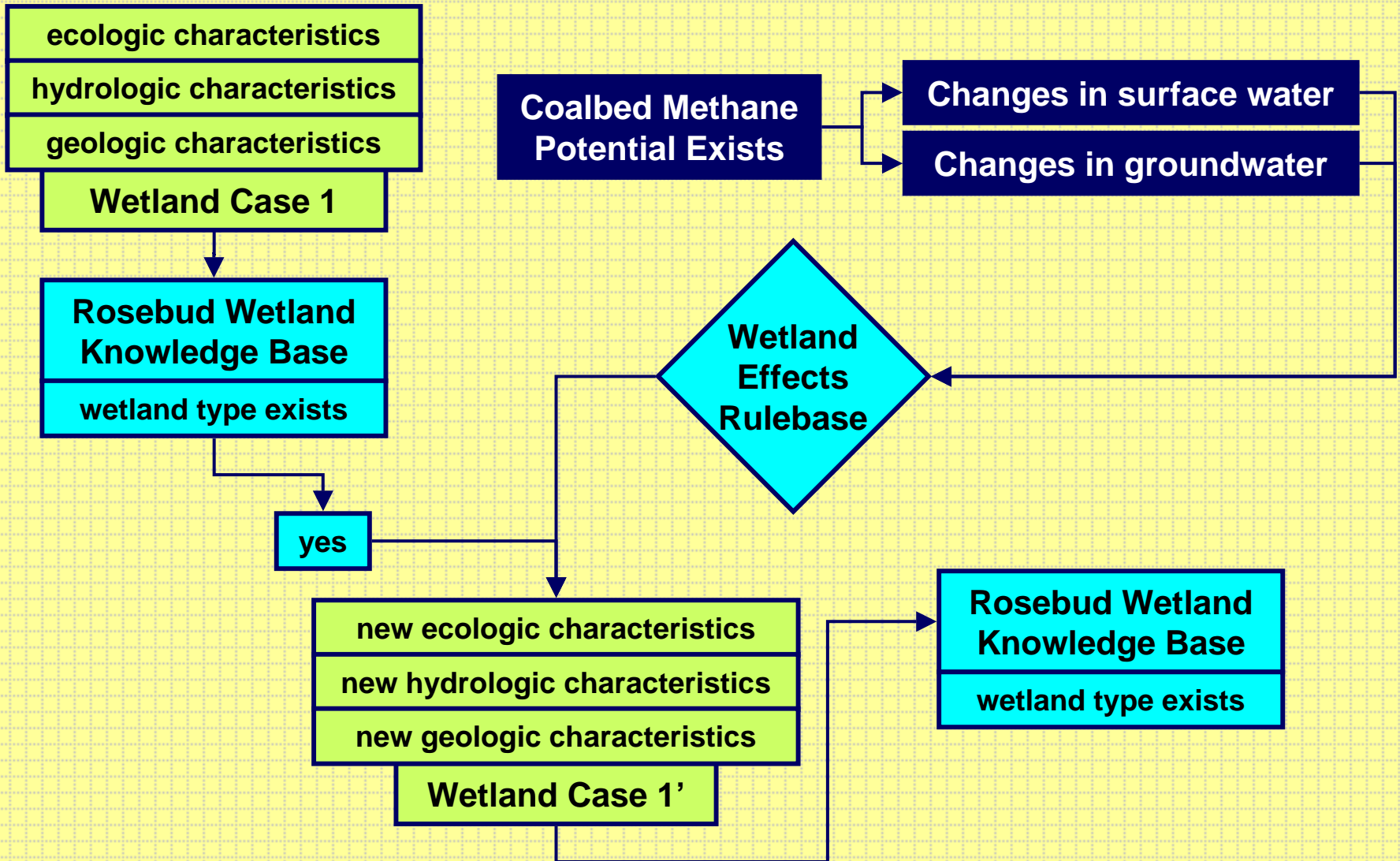
# Conceptual Model (High Level) to Predict the Effect of Coalbed Methane Production on Wetlands



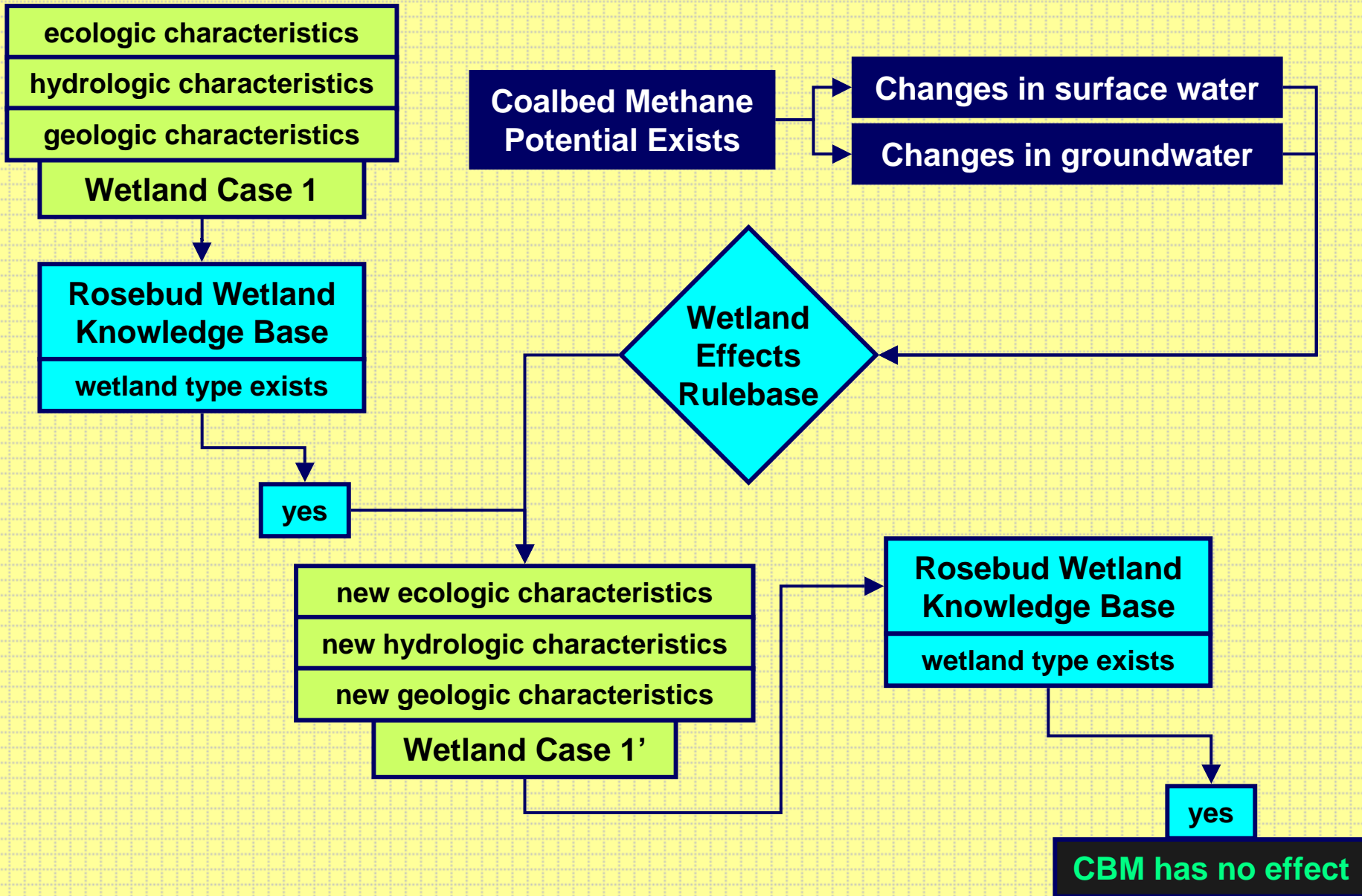
# Conceptual Model (High Level) to Predict the Effect of Coalbed Methane Production on Wetlands



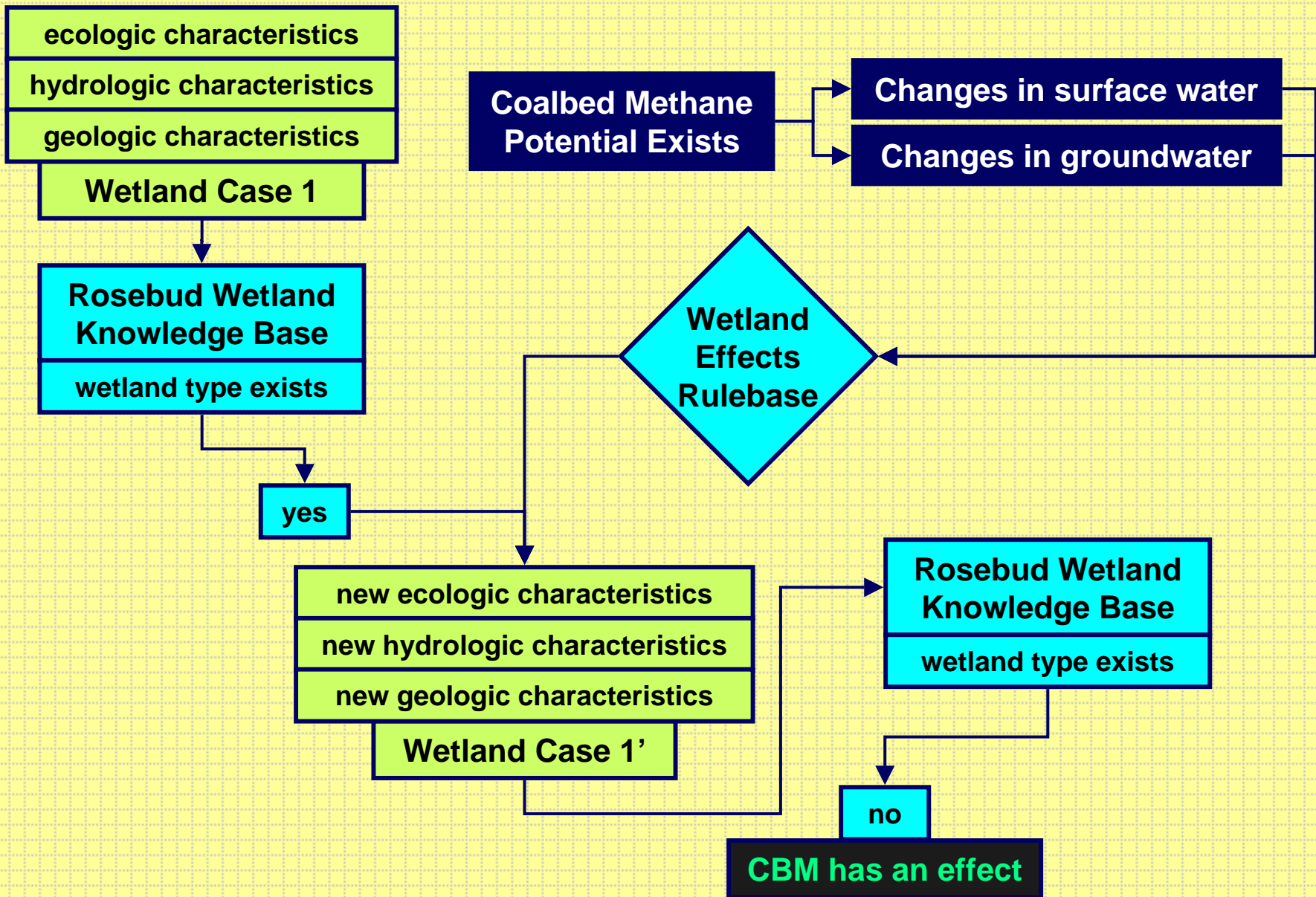
# Conceptual Model (High Level) to Predict the Effect of Coalbed Methane Production on Wetlands



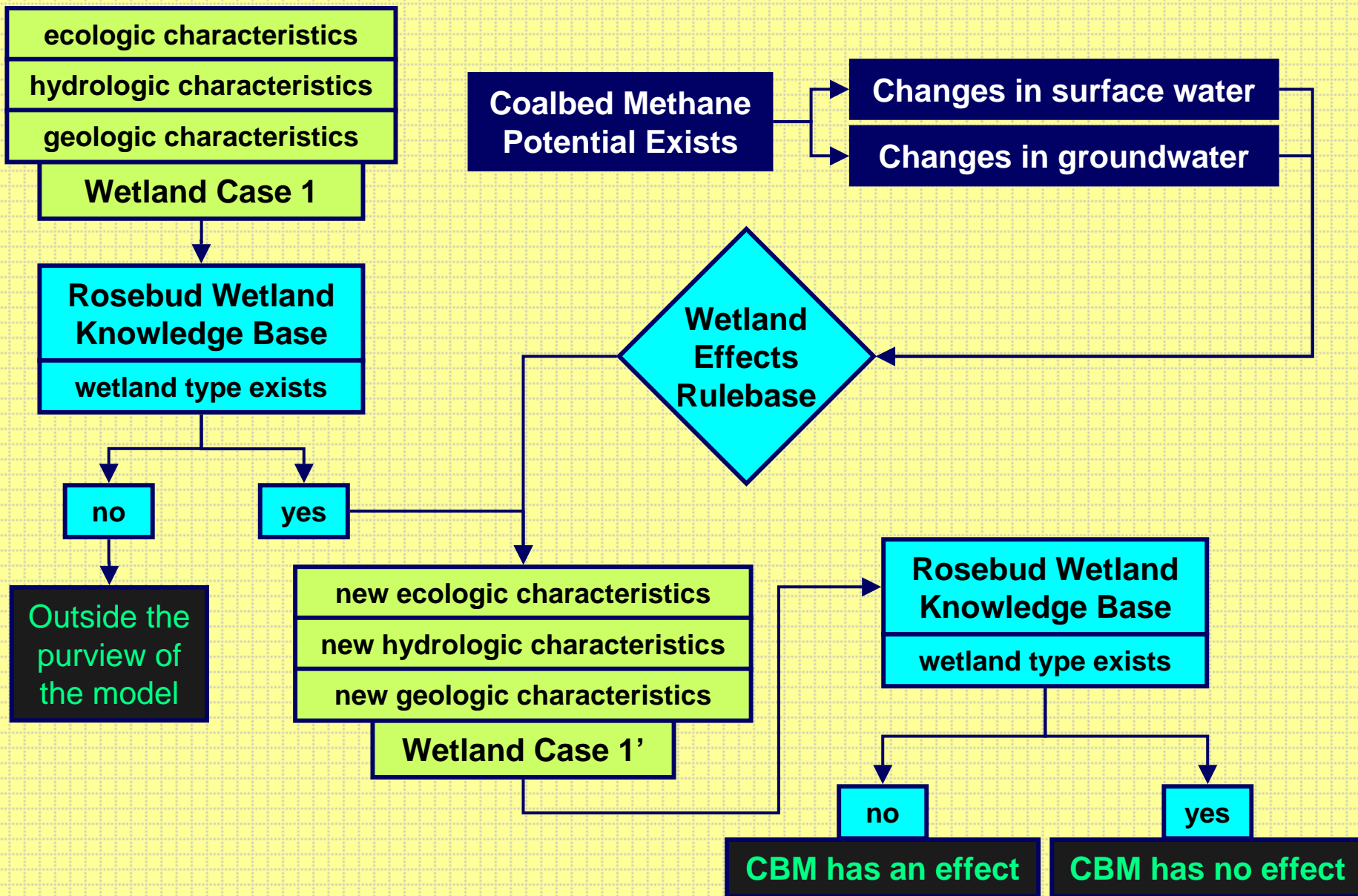
# Conceptual Model (High Level) to Predict the Effect of Coalbed Methane Production on Wetlands



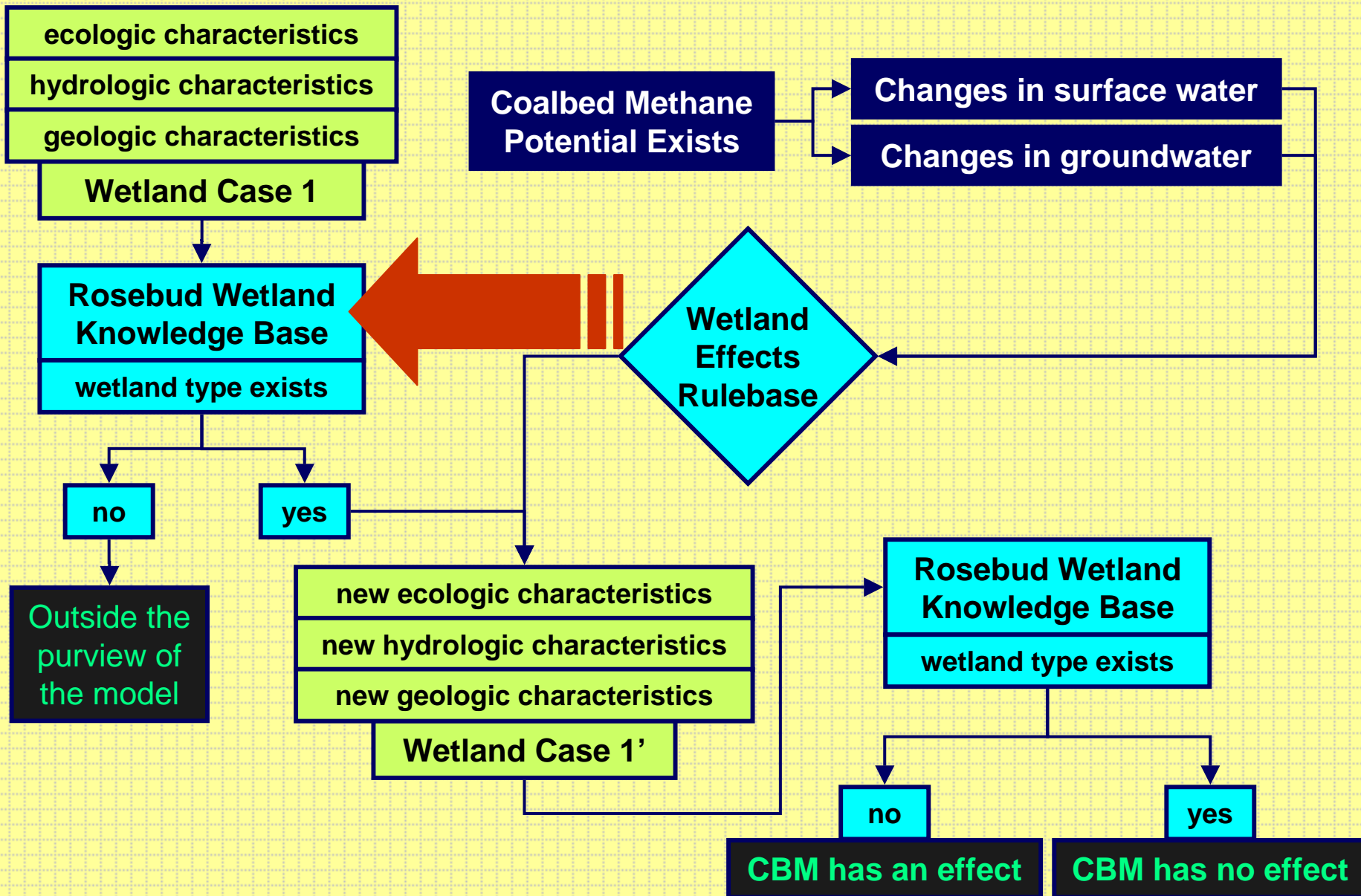
# Conceptual Model (High Level) to Predict the Effect of Coalbed Methane Production on Wetlands



# Conceptual Model (High Level) to Predict the Effect of Coalbed Methane Production on Wetlands

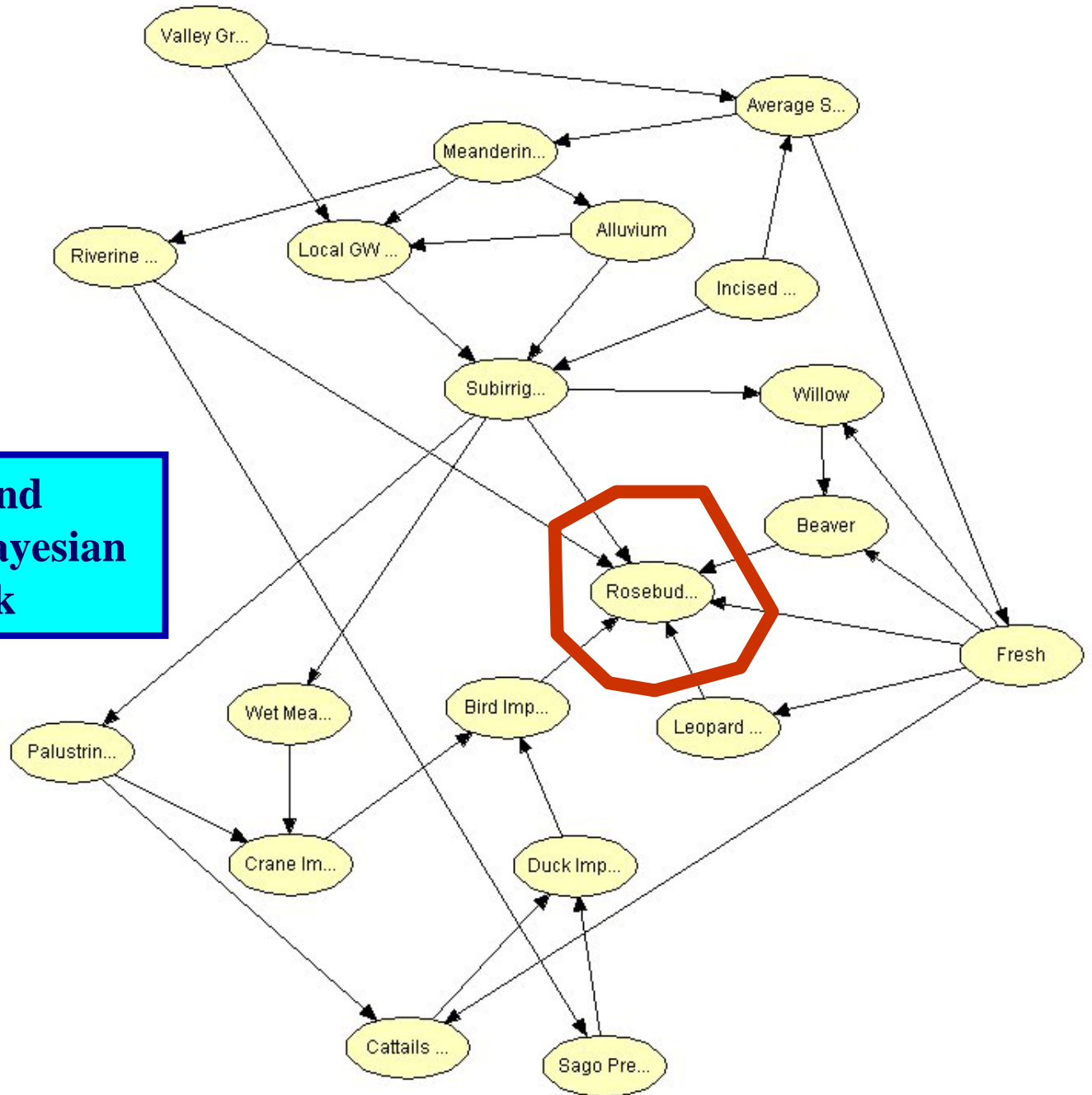


# Conceptual Model (High Level) to Predict the Effect of Coalbed Methane Production on Wetlands





**Rosebud Wetland  
Knowledge Base: Bayesian  
Belief Network**



## **Immediate Research Interests:**

- **Build the actual model**
- **Inventory wetlands similar to those along Rosebud Creek**
- **Investigate connections between migratory bird habitat and geohydrology**



# **Future Coalbed Methane Research:**

- **Effects of production water on waterbirds (Sandhill cranes) and their habitat**
- **Geomorphology of Rosebud type and interconnections with ecological factors, e.g., beaver**
- **Hydrologic connections between well heads and wetlands**
- **How to manage production water ponds**
- **Linkages between water chemistry and soils**
- **Relationship between economics of production, land use, and beaver populations**
- **Probabilities of coalbed methane being produced**





**Dr. Richard Sojda**  
**Northern Rocky Mountain Science Center**  
**Montana State University**  
**Bozeman, MT**  
**TEL: 406.994.1820**  
**sojda@usgs.gov**

**P**owder

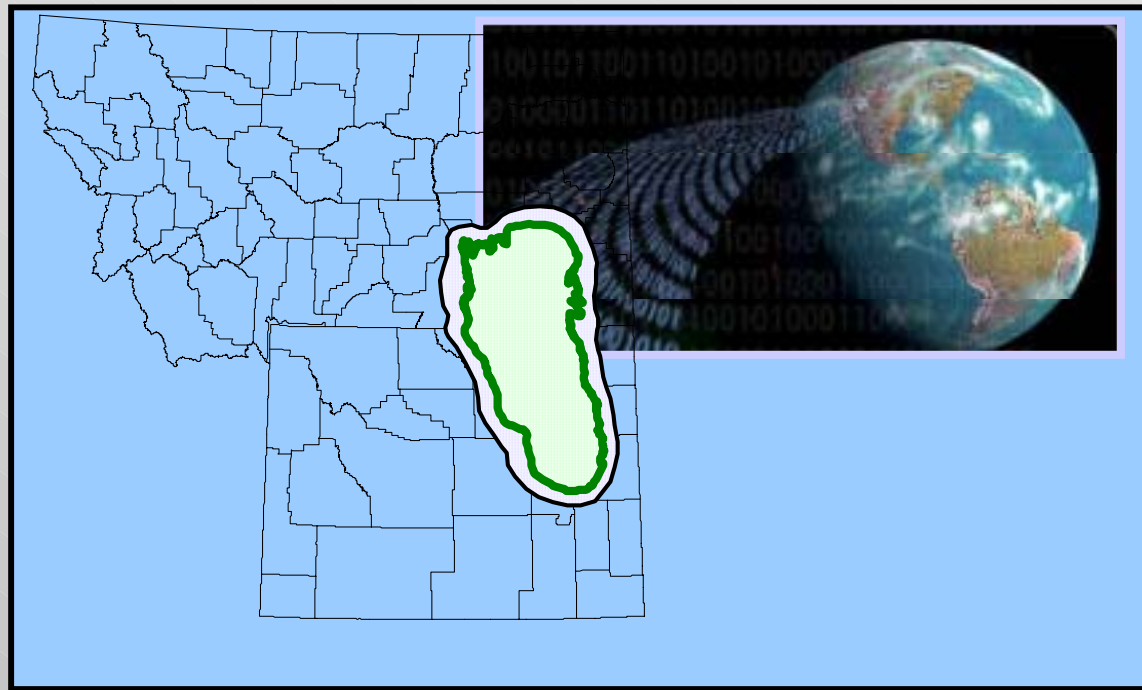
**R**iver

**I**nformation

**S**cience

**A**ccess

**S**ite



**PRISAS** - will be a web-enabled, spatially referenced, decision support and information dissemination system encompassing the Powder River Basin to support the needs of state and federal resource managers, private industry, and the public in general.

**Key Objectives**

- Provide Access to PRB Data
- Provide Access to PRB Information
- Provide Decision Support Capability
- Consolidate CBM Information

Project Lead: Lance Clampitt – 406-994-6919

lsclampitt@usgs.gov

