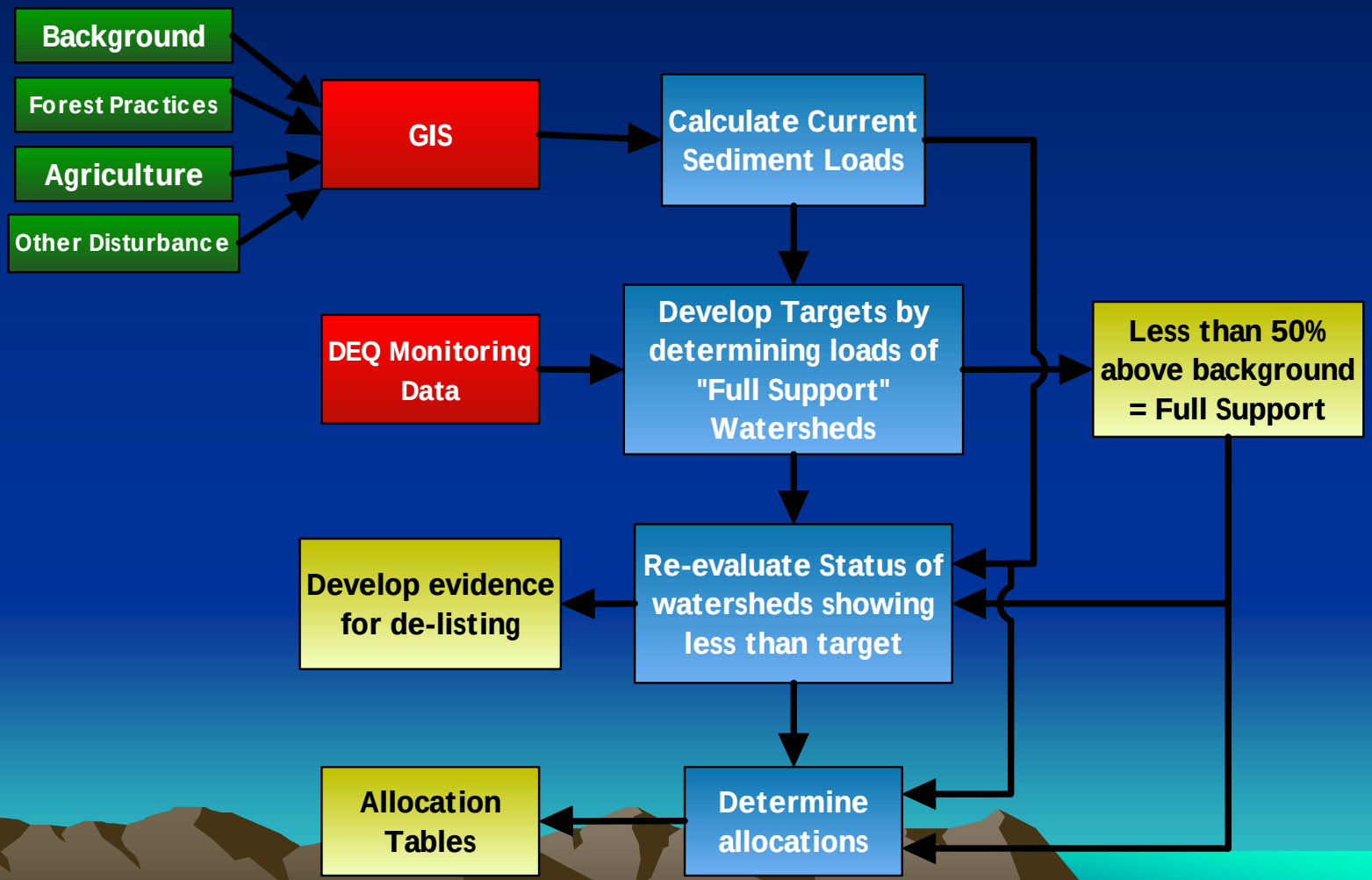
PEND OREILLE SEDIMENT TMDL METHODOLOGY

BY BRUCE CURTIS
PARSONS

LOAD CAPACITY

- TMDL ≤ WLA + LA + MOS
  - WLA = Waste Load Allocation (Point Sources)
  - LA = Load Allocation (Non-Point Sources)
  - MOS = Margin of Safety

Sediment TMDL Process



WASTE LOAD ALLOCATION

TMDL ≤ WLA + LA + MOS

- WLA = 0
  - No Point Sources discharging within/to the 303(d) listed assessment units

LOAD ALLOCATION

TMDL ≤ WLA + LA + MOS

- To be determined – Watershed Loading Estimates of Nonpoint Sources of Sediment
- Sediment Sources
  - Agriculture
  - Roads – surface erosion, road crossings and road encroachment
  - Forested areas
  - Mass wasting, landslides
  - Urban development

MARGIN OF SAFETY

TMDL $\leq$ WLA + LA + MOS

- MOS = 0
  - Initial Assumption
  - Methodology Very Conservative
  - Conservative Assumptions will be documented (e.g., 100% of sediment loading is available for deposition in stream bed)

NATURAL BACKGROUND

TMDL $\leq$ 1.5* NB

- Assume Coniferous Forest
- Sediment Yield Rate

EXISTING SEDIMENT LOAD

- Sediment Sources
  - Land Use (Forest, Agriculture, and Urban)
  - Roads
  - Mass Wasting

EXISTING SEDIMENT LOAD - LAND USE

- Agriculture/Pasture
  - RUSLE2
- Forest
  - Sediment Yield Coefficient
- Urban
  - Sediment Yield Coefficient

Sediment yield coefficients used in the Kootenai River Subbasin sediment TMDL

• Bench Agriculture	0.055 (t/a/y)
• Valley Agriculture	0.026 (t/a/y)
• Forest (natural background)	0.03 (t/a/y)
• Forest Road	0.50 (t/a/y)
• Railroad	0.50 (t/a/y)
• Pipeline	25 (t/a/y)
• Disturbed	0.07 (t/a/y)
• Access road (disturbed landscape)	2 (t/a/y)
• Burn/Shrub	0.08 (t/a/y)

EXISTING SEDIMENT LOAD - ROADS

- Road Surface Erosion
  - McGreer Relationship (Forest Haul Roads)
  - Sediment Yield Coefficient (Other Roads)
- Stream Crossings
  - RUSLE2
- Road Fill Encroachment

EXISTING SEDIMENT LOAD – MASS WASTING

- Anthropogenic
- Natural

EXISTING SEDIMENT LOAD - FIRE

- Recent
- Historic

SEDIMENT DELIVERY

- Direct Delivery
- Indirect Delivery

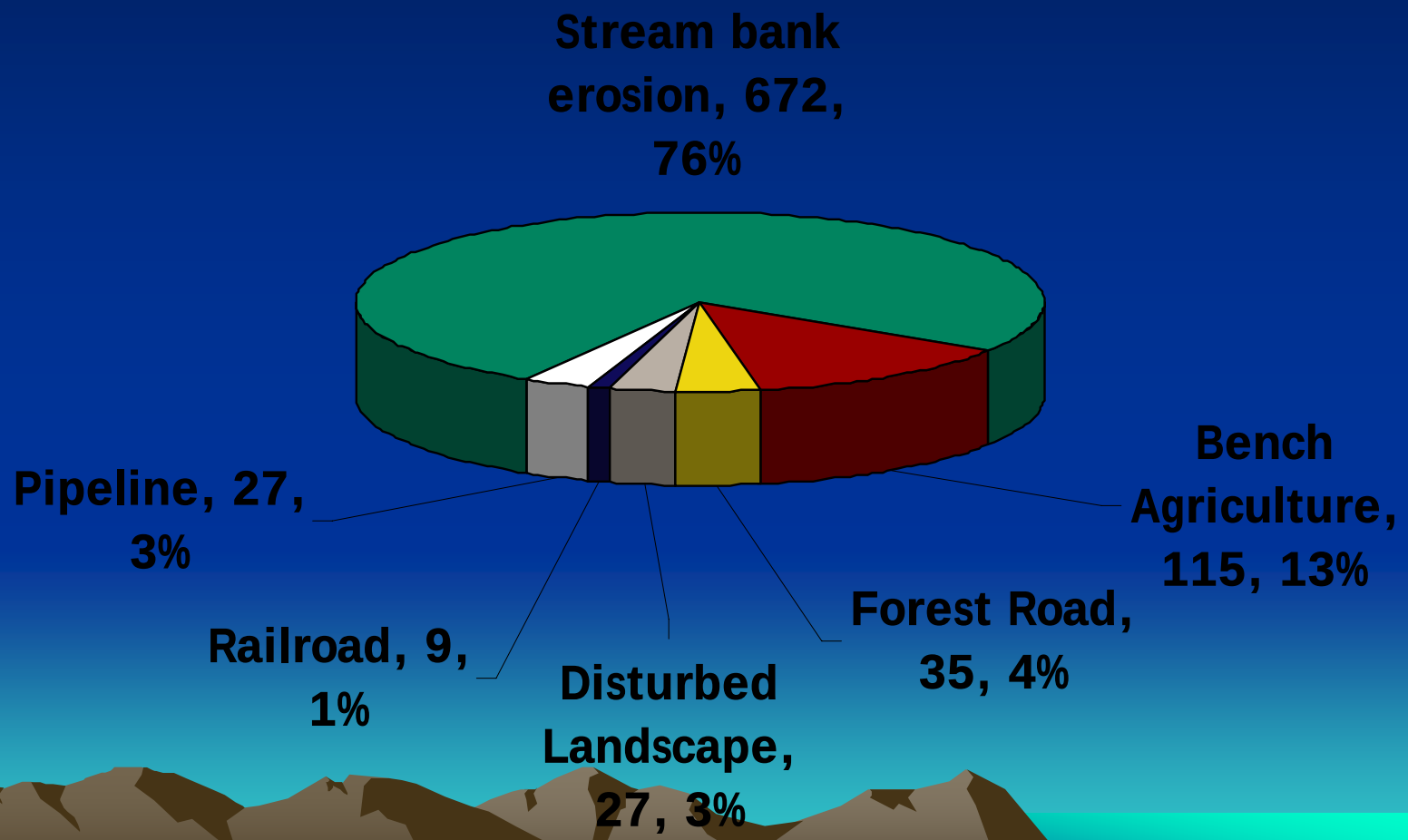
MODEL VERIFICATION

- Verify that LC is 50% above NB
- Model load at BURP Locations

LOAD REDUCTION ALLOCATION

- Total Load Reduction = Existing Sediment Load – LC
- %Reduction = Estimated Sediment Load (Non-Nat)/Total Load (Non-Nat)
- Load Reduction (Land Use) = %Reduction * Total Load Reduction

To meet TMDL target, We need to reduce load to Deep Creek by 885 tons/year



DATA GAPS

- In-Stream Sediment Load and Transport Measurements
- Stream Bank Stability
- CWE Data for North Gold, Upper Pack River, and Schweitzer Creek
- BURP Data for Sand Creek
- Fire Data from 1970 to Present

QUESTIONS