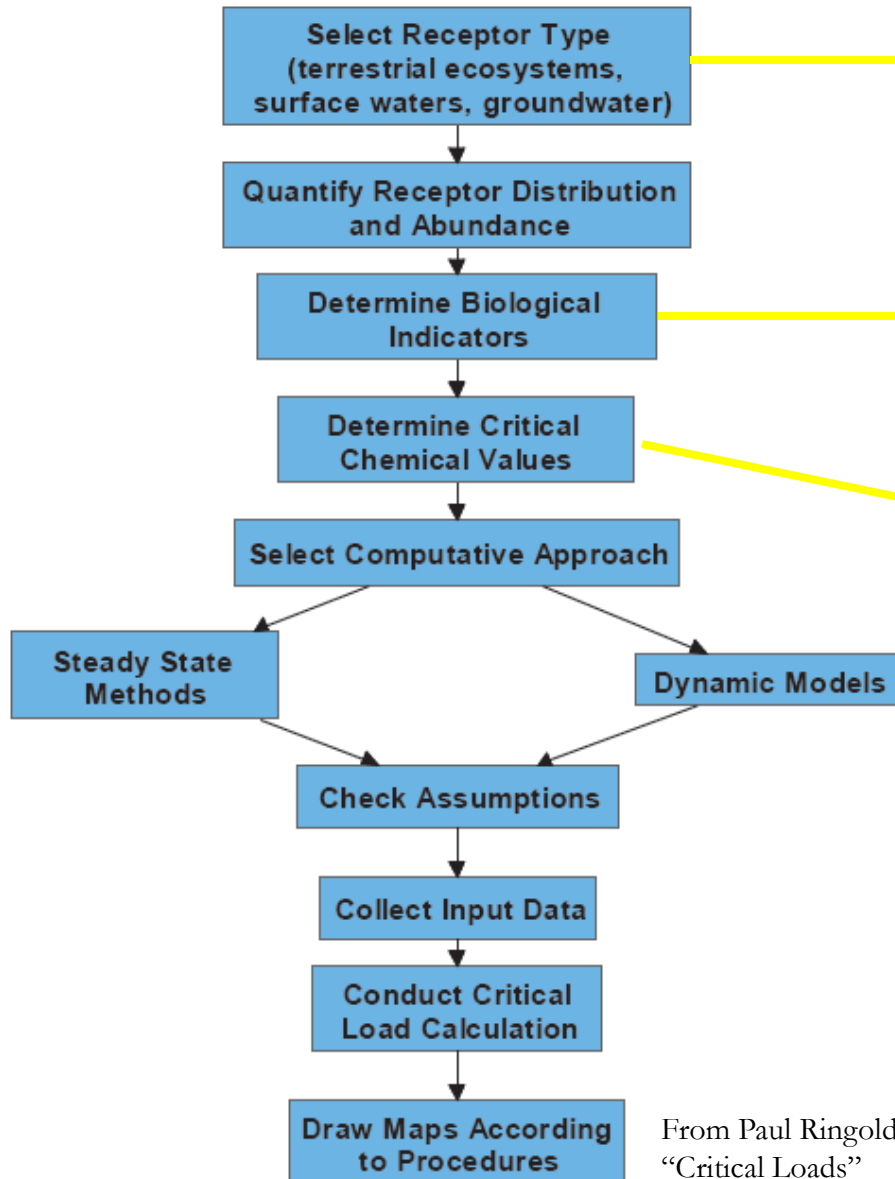


Critical Loads of Atmospheric Deposition FOCUS Workgroup C:

*Using Linkages Between Soil Solution Chemistry
and Plant Physiological Response to Help Inform
Critical Load Calculations*

Richard Warby (Ph.D.)
Courtney Donovan

Critical Loads



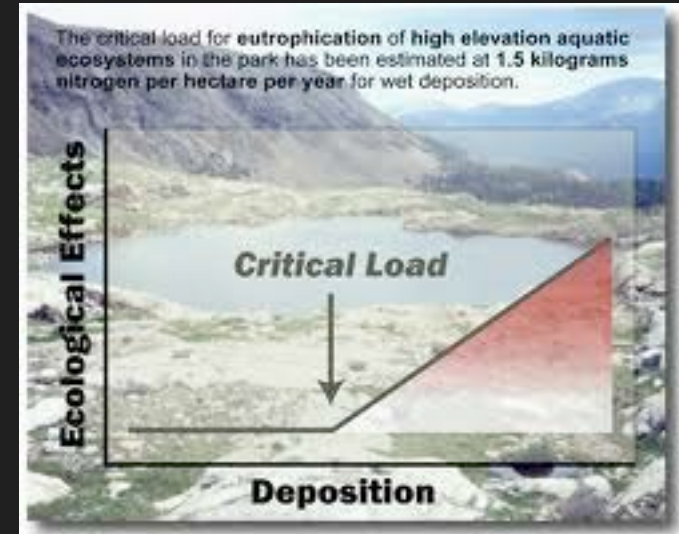
→ Forests or surface waters

→ Brown trout or rate of forest growth

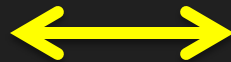
→ Surface water ANC of $50 \mu\text{eq/L}$ or $\text{BC/Al} > 1$ or 10 for soils

From Paul Ringold
“Critical Loads”

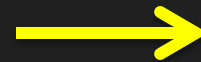
FOCUS Workgroup C Task



Soil Solution
Chemistry



Plant Physiological
Response



Critical Thresholds of
Chemical Criteria



FOCUS Workgroup C Goal 1:

Assembling currently available data relating soil solution chemistry to plant physiological responses

- Literature review
- Brainstorming to identify any possible data sources
- Assembling data where available
- Preliminary analysis of patterns
- If there is substance here, publish it

FOCUS Workgroup C Goal 2:

Identifying research sites or studies where partial data are available (soil solution chemistry or plant response)

- **Step 1:** Identify sites where partial data exist
 - Co-located
 - » Coordinated studies
 - » Not planned together
- **Step 2:** Based on the analysis in step 1, identify which datasets are most likely to yield usable results

FOCUS Workgroup C Goal 3:

Prioritizing future research
(funding permitting)

- Based on the analysis in steps 1 and 2, it should be possible to set priorities about the most promising avenues of future research

FOCUS Workgroup C :

Additional workgroup objectives

- Recommend whether any change in the CL calculations are warranted.
- Is the use of BC:Al ratio warranted as a critical chemical criterion?
- What is the evidence of vegetation response?
- Is a different criterion better supported?
- One possible outcome or recommendation: RFP for additional analyses needed to identify relationships in specific regions?

Literature Review Progress

- A total of 237 articles have been collected and prioritized by relevance:
 - 1st priority: 37 sources
 - 2nd priority: 105 sources
 - 3rd priority: 85 sources

Challenges to Date

- Very few papers explicitly relate soil solution chemistry to plant physiological response

To overcome this:

- Explore relationships between soil exchangeable properties and soil solution chemistry (Gaines-Thomas?)
- Is it plausible to use soil exchangeable properties in place of the solution chemistry?



Questions?

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