

Lessons Learned - 10 years of the SRST.



Expert Panel Meeting
October 12-13, 2011



When We Began: Science Team Charter

Feb 14, 2001

- Composed of DEQ, VDH, DGIF, Citizen's Groups, Academia
- Mission - serve as a focal point for technical and scientific issues in support of steering committee
- Objectives - review data, trends, gaps; fate and transport issues, remediation, communications, ID and prioritize additional study areas; exposure issues; refine and develop conceptual models, develop plan to fill data gaps; explore watershed management options; fishery management options; monitor developments at other Hg sites; information transfer - expert lectures.

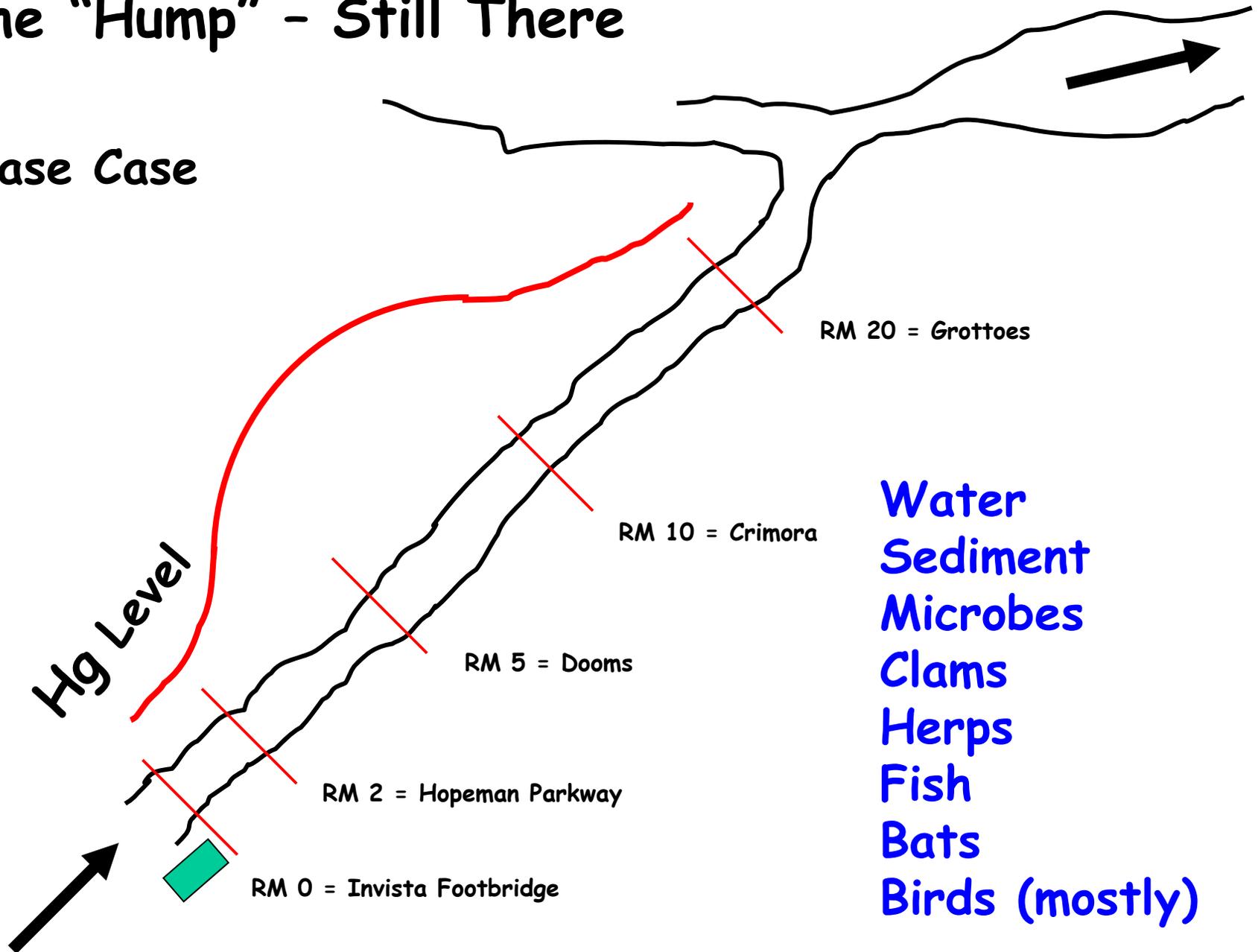
We Matured:
Science Team Charter
Revised October 6, 2009



- Membership - Government, Academia, Environmental Groups, and DuPont
- Mission - serve as a focal point for collecting and interpreting information to help mitigate legacy mercury contamination in the South River watershed.
- Objectives - collect, analyze and interpret diverse environmental datasets; conduct outreach at the local and state levels; communicate findings to scientific and lay audiences; explore **and prioritize** remedial, restoration, **and risk reduction** options.

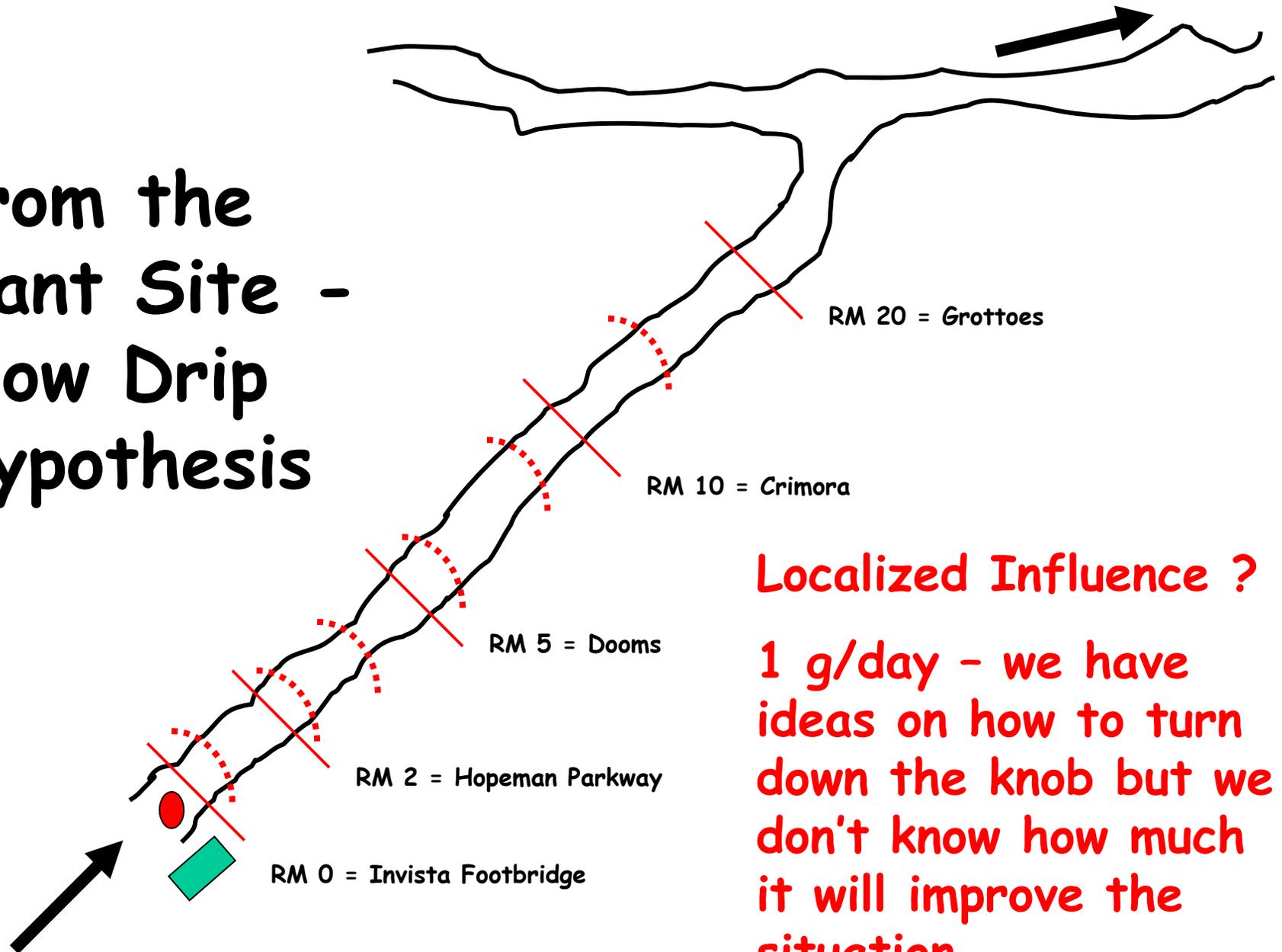
The "Hump" - Still There

Base Case



- Water
- Sediment
- Microbes
- Clams
- Herps
- Fish
- Bats
- Birds (mostly)

From the Plant Site - Slow Drip Hypothesis

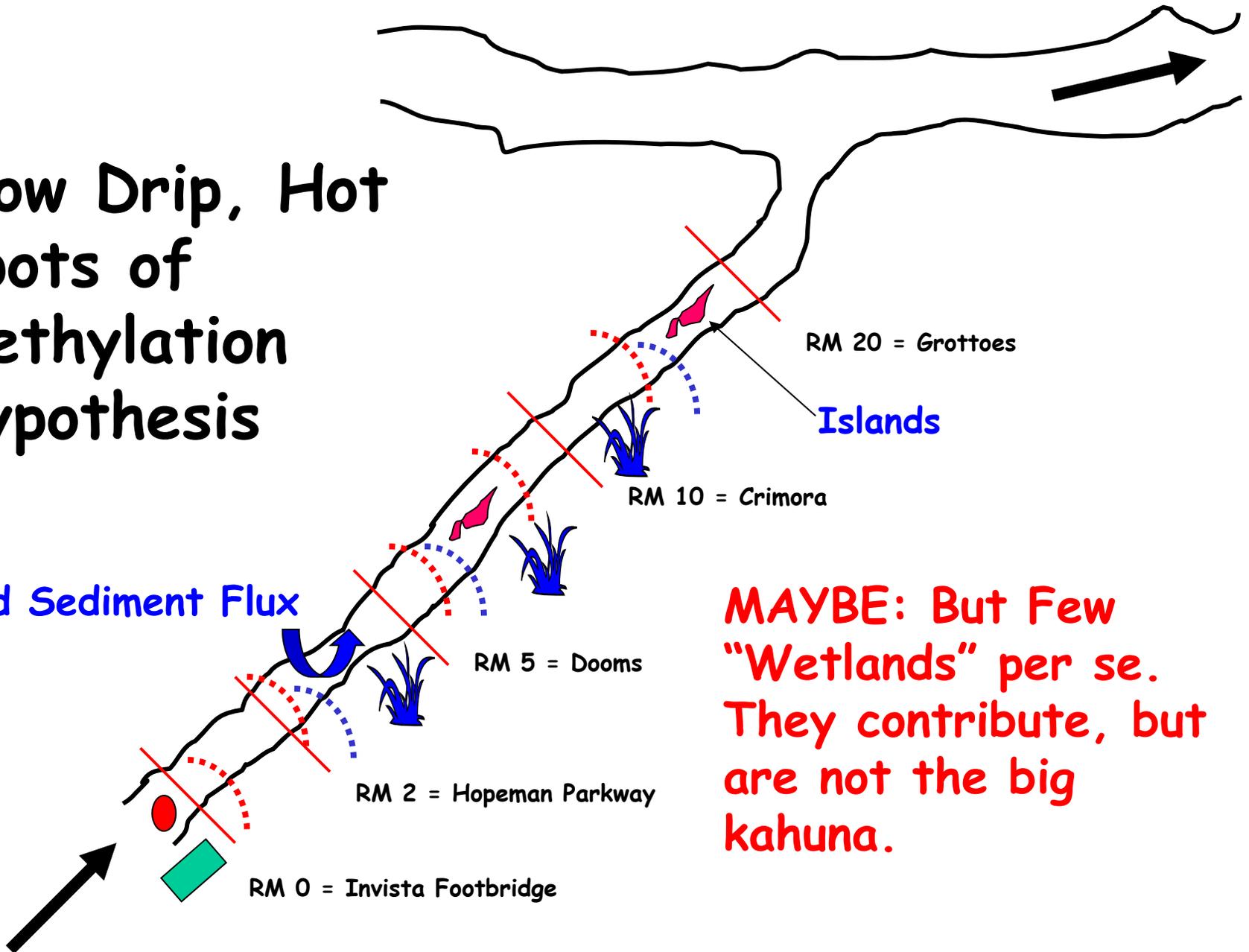


Localized Influence ?

1 g/day - we have ideas on how to turn down the knob but we don't know how much it will improve the situation

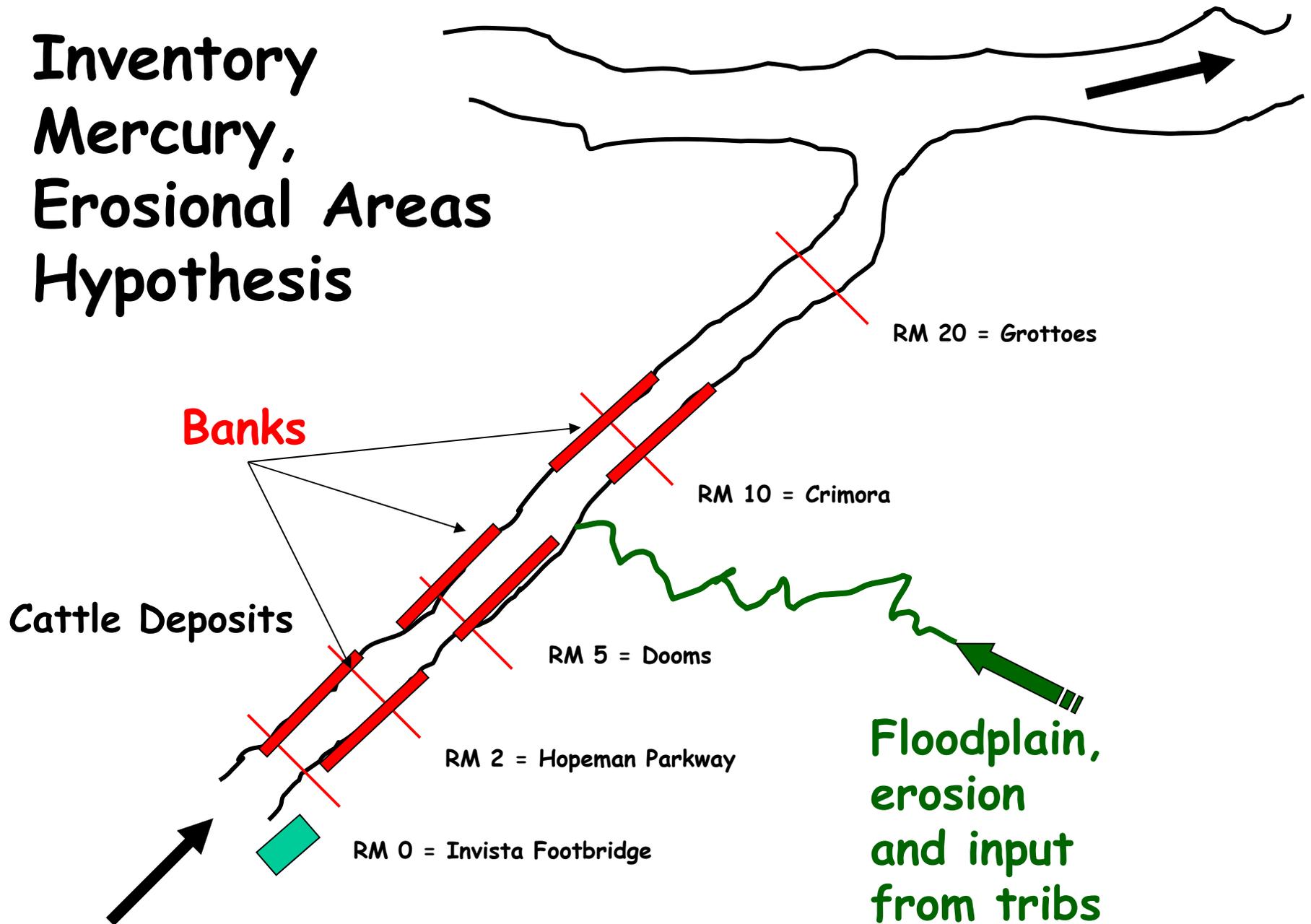
Slow Drip, Hot Spots of Methylation Hypothesis

Bed Sediment Flux



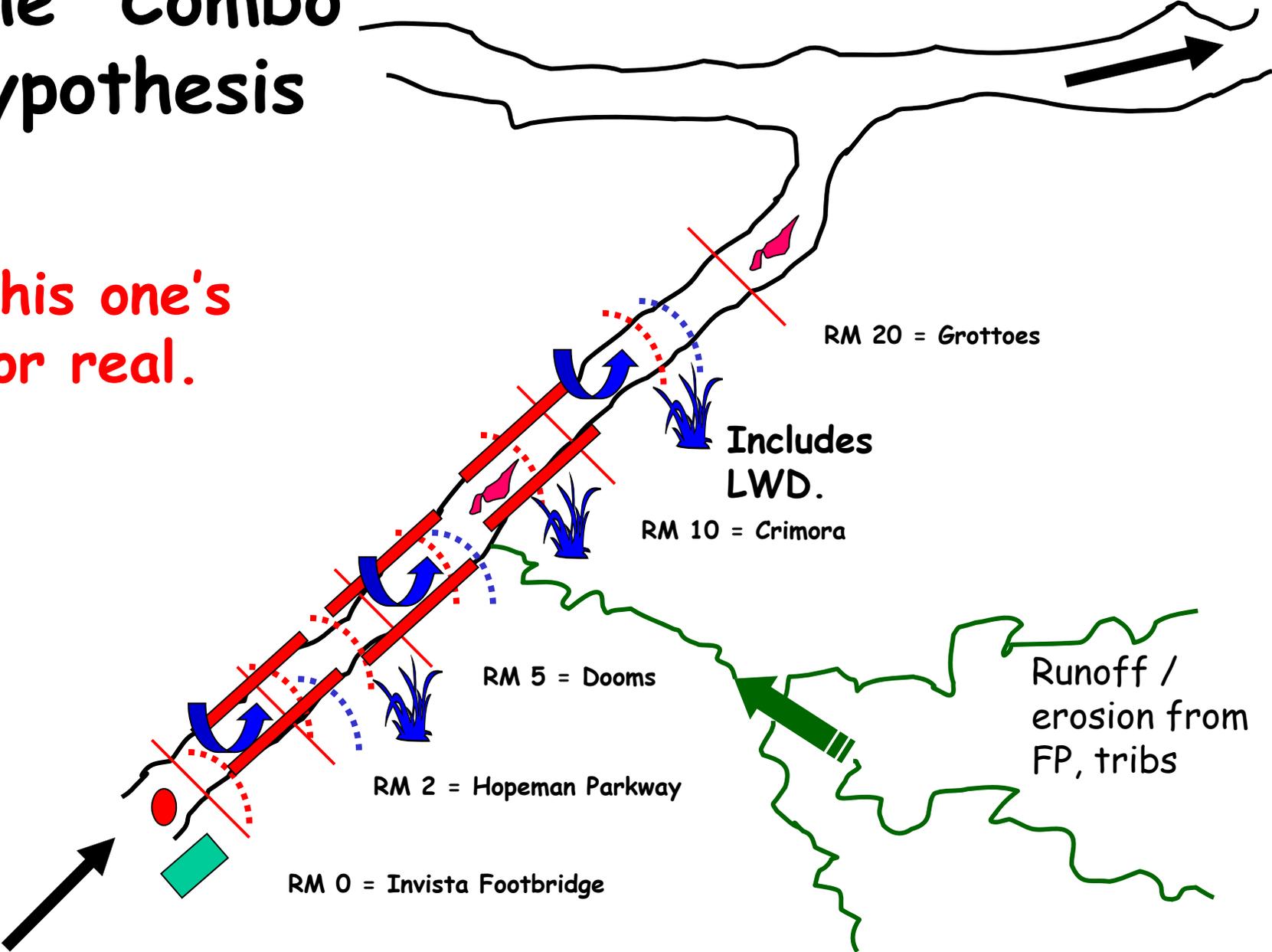
MAYBE: But Few "Wetlands" per se. They contribute, but are not the big kahuna.

Inventory Mercury, Erosional Areas Hypothesis

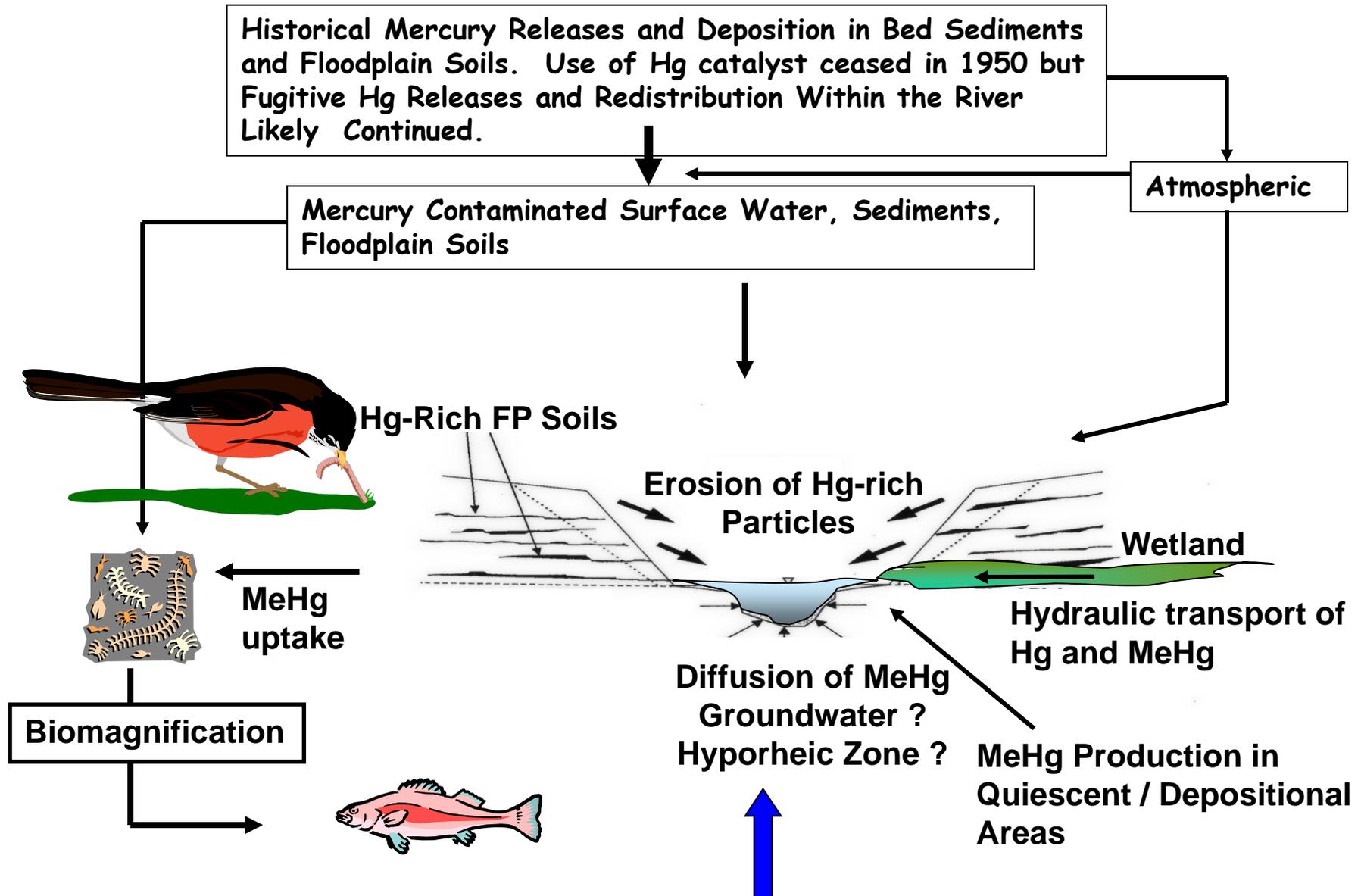


The "Combo" Hypothesis

This one's for real.



Conceptual System Model of Historical Mercury Contamination and Current Exposure Pathway To Fish in the South River, Virginia.



SR Watershed Management Goals

"DRAFT - Revisit in 2011"

- Minimize human exposures
- Reduce or eliminate fish consumption advisory
- Reduce or eliminate Hg loading to wildlife
- Restore human uses and ecological resources
- Maintain water supply for irrigation and agriculture
- Enhance and improve cold water fishery
- Improve overall water quality
- Identify and eliminate sources of Hg to South River and adjacent floodplain
- Identify and prioritize remedial and restoration options.

From the Experts: Accelerate Shift in Emphasis for SRST

- From data collection by individual investigators to multidisciplinary, collaborative efforts leading to
 - insight generation
 - joint field studies
 - remedial options testing
- From South River mercury-centric to regional watershed multi-stressor-centric
 - impact of other ecological stressors on Hg-contaminated fish
 - comprehensive, site-specific set of metrics
 - reconsider reference site selection
 - additional statistical tools
 - link structural measures to ecosystem processes

Better Articulate and Substantiate Conceptual Models

- On a reach-by-reach basis
- Include
 - inorganic Hg sources
 - methyl Hg production compartments
 - linkages to base of aquatic food web
 - role of periphyton
 - pathways from aquatic to terrestrial food webs
- Consider nutrient spiraling framework as way to better understand Hg retention and transport

Get More Specific on Remedial Options

- Reconcile feasible options with conceptual models on reach-by-reach basis
- Consider
 - streamside mesocosm experiments
 - *amendment testing*
 - *prioritizing bank stabilization sites*
 - natural vs. revegetated vs. engineered bank stabilization techniques

Personal Observations

- Getting a good understanding was harder, and took more time than we anticipated.
- Getting the experts and academics involved was one of our best ideas.
- Working as a SRST has paid substantial dividends; and will in the future.
- More study/investigation will not significantly change our conceptual model.
- Working as a team will continue to be important as we test remedial and mitigation options.

Discussion

