Century-Scale ELM Simulations

- **1.** For Peer Review Panel request
- 2. Ecosystem processes & landscape patterns

"Proof-of-concept" for long-term simulations

Example: Maintenance of patterned ridge & slough landscape

3. Future directions

Immediate:

- document new applications
- results & interpretations of century-scale a) ridge & slough pattern maintenance runs and b) "perturbation" runs (and use as aid to explain 20-year perturbation runs)

Near/long term (after Peer Review Project):

- add horizontal particulate carbon transport: invoke & refine vertical "hydrodynamics" module of unit model (1996); invoke placeholder for horizontal carbon flux
- upscale the critical lessons from fine-scale applications to the regional, 1km application

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Ecosystem processes in synthetic landscapes at century time scales

- 1. Utilize available data on habitats, topography
 - a) Central WCA-3A Ridge & Slough pattern of classified habitats
 - b) Generate "synthetic" topography from helicopter survey points
- 2. Apply current ELM v2.5 algorithms & parameters

no algorithm or parameter changes from ELM v2.5

- a) New utilities for selectable (synthetic) overland flow & rainfall inputs
- 3. Evaluate process pattern interaction at century-scales
 - a) Extension of request by ELM Peer Review Panel
- 4. A work-in-progress!!

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Question: Can we simulate how the landscape pattern is maintained?

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What pattern? (local scale patterns at << 1 km grid)



Landscape pattern ~evident at 250 m scale. Directional pattern clear at 125 m scale.

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The model applications

- 1. Develop two applications: 250 m and 125 m grid scale
- 2. "Nominal" conditions over 108-yr period
 - a) Concatenate 1965-2000 climate data (3 repeating sets)
 - b) Overland inflows that approximate 20% of long-term rainfall

	Rain in	Overland	Groundwater	ET	Overland	Groundwater
	(cm mon-1)	in (% rain)	in (% rain)	out (% rain)	out (% rain)	out (% rain)
Monthly mean, 108-yr Budget:	10.4	20%	0%	84%	34%	3%



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(two animations not embedded in this ppt file)



Surface water tracer: source is 2 cells inoculated in surface & pore water Surface water TP: sources are boundary inflows (at top), & soil/floc mineralization

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- **1.** Nov 3 overview intended to inform ELM Peer Review Panel of status
- 2. Nov 22, 2006 due date for ELM developer response to Panel requests Document 20-yr and 100-yr "perturbation" runs Document issues related to phosphorus boundary conditions Statistical summaries of regional "water quality" model performance Multiple other clarifications and/or new information, per priority need

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