

***Interactive comment on “Hydropedological
assessment of a vertisol climosequence on the
Gulf Coast Prairie Land Resource Area of Texas”
by L. C. Nordt and S. G. Driese***

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Received and published: 20 June 2009

General Comments: Overall, this is an interesting and well written manuscript. The data presented deal with an important hydropedological issue of quantifying saturation and reduction in Vertisols across a climatic gradient. The data were well described and present a fairly comprehensive characterization of redoximorphic feature morphology in the studied Vertisols. Specific suggestions for improvement are indicated below.

Specific Comments: Introduction P3640 L14 – Why is the qualitative model of Vertisol formation included – how is this important to the remainder of the work. Is this the main

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thrust of analyzing all the data presented – then present this as the primary objective, with detailed morphologic/chemical analyses subsidiary to this.

Setting and methods P3641 L25-30 – It would be helpful to include either an image or conceptual image demonstrating the various types of redoximorphic features – not all readers will be familiar with the morphology and morphologic jargon associated with the description of these features, e.g., are the same thicknesses used to describe diffuse/nondiffuse for soft masses as for pore linings, how can a redox feature be located in a void, etc.?

P3642 L1-5 – Provide some definition and thickness cutoffs for the various boundary categories, i.e., diffuse and nondiffuse. I assume these differ from the cutoffs used for genetic horizon description and those not familiar with redoximorphic feature morphology will not have a reference or well defined context for these terms.

Redoximorphic features P3643 L11 – the sentence starting with “Further, cm of the ...” is awkward as written, consider rephrasing/rearranging.

Again, it would be helpful having a picture/conceptual image of these features to put these data in context and I would encourage the authors to incorporate this into the manuscript.

P3644 L10 – define the difference between “gley” and “nongley” in terms of Munsell hue for those not familiar with terminology

P3644 L24 – Is there no other information on the type of crayfish? Can the data collected in this study provide some insight as to the complexity of burrows so this statement can be made more conclusively?

Section 4.4 P3645 L19-30 – Would anything be gained by looking at the Feo/Fed ratio as a means to understand the relative crystallinity of the iron oxides? It appear much more crystalline Fe at high MAP – is this relevant to the cyclical redox story?

Comparison to monitoring stations P3646 L9 – So were soil samples collected at vari-

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ous times and depths and tested with alpha-alpha dipyridil coincident with piezometer measurements?

P3647 L9 – The sentence starting with “However, only 8%...” is simply a restatement of the later half of the previous sentence. This line is not needed – consider deleting.

These data are a bit confusing – so the upper 5-cm is saturated 29% of the time and then 25% of this time it is reduced or 25% of the monitoring period it is reduced according to alpha-alpha dipyridil? If the later, these data indicate greater periods of reduction in surface soils, i.e. almost the entire time period of saturation – does this correspond with observe morphology/chemistry?

P3647 L16 – It is unclear how contemporaneous relative to relict iron reduction is determined. It appears to be based on boundary diffusivity – but it was not explained in the text.

Hydropedological formation of Vertisols The data and discussion here are good, but may be improved in clarity by discussing/summarizing processes in the dry and wet ends separately, rather than intermixing discussion of Laewest and League soils. It may also help to refer to the soils simply as “wet” or “dry” rather than the series name, as the back and forth between the two series becomes confusing. A conceptual table/figure that summarizes the likely processes for each soil may also help – although would add another figure to an already figure rich manuscript.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 6, 3637, 2009.