From jmortens@eos.ubc.ca Sat Jan 17 22:32:34 1998
Date: Fri, 16 Jan 1998 13:59:46 -0800
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Subject: Next week's meeting

Next week's meeting will be on continental arcs and the metallogeny of continental margins. We have come up with four papers for you to look at. One is a fairly long one by Mpodozis and Ramos on the evolution of the South American Andes, which is probably the best-studied, relatively simple continental magmatic arc in the world. There is also a paper by Mark Barton on the magmatic and metallogenic evolution of the SW United States, as well as a paper by Dick Sillitoe (who else??) on gold deposits in Chile and another by Spence Titley on porphyry deposits in the SW U.S. The Mpodozis and Ramos paper is unfortunately fairly poor quality (blame J.T. for this!), so the figures are fairly faint. I will try to round up an original copy of this to put out, but may not be able to.

You should all try to get through both the Mpodozic and Ramos and the Barton papers, and at least scan the Titley and the Sillitoe paper (there is a bit of repetition between the Titley and Barton papers).

The questions to consider as you are doing the reading are:

1. Why is the Andean arc segmented, both in terms of tectonics and metallogeny? (Vanessa)

2. What role does the continental crust play in (or what effect does it have on) the magmatism and metallogeny of the SW U.S.? (Ana)

Note that although Vanessa and Ana will be expected to discuss these topics for 10-15 minutes, you are ALL expected to have thought about these questions and be prepared to discuss them, along with the rest of the papers!

I'll get copies of the papers into the box shortly.

Remember that our meeting time next week is Friday, 2 to 5 PM.

Cheers, Jim

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Subject: This week's meeting....

We will be discussing terranes and litho-tectonic assemblages in the Canadian Cordillera this Friday at the usual time. I will put a copy of a paper by Monger and Nokleberg (1995) in the box for you to read, and also the text of a talk that Jim Monger gave at a short course last weekend. John is trying to find a good ref. on the metallogeny of the N. Cordillera; hopefully we'll have a paper in the box this afternoon; I'll let you know.

Ana has (been...) signed up to lead the discussion this week. The question for her and all of you to think about is: Do individual terranes extend the full thickness of the crust (and underlying mantle) or are they "flakes" riding along the surface and decoupled from their mantle root? What is the evidence for or against this and what are the implications for pre- and post-accretionary metallogeny?

Have fun!

Cheers, Jim

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Subject: This weeks readings....

Hi, folks - Sorry we're running a bit late on getting the papers for this week out for your consumption! They're in the box by the Geochron lab now.

This week we're talking about the evolution of the mid-Proterozoic to mid-Paleozoic margin of Ancestral North America in the Canadian Cordillera and the controls/depositional environment in which SEDEX deposits formed in this region. I couldn't come up with a good, reasonably concise paper on the evolution of the miogeocline, so I just put the first 10 pages of a paper by Gabrielse and Yorath from the Canadian Cordillera DNAG volume in the box. It gives a VERY brief summary of the evolution of the margin, and I will talk about this in a bit more detail on Friday. The other main paper is by Goodfellow et al. (1993). This is a fairly exhaustive review of SEDEX-type deposits (50 pages long!), but you don't need to read the whole thing (although you should try to at least scan most of it). Concentrate on pp. 203-210, 214-221, 227-237, and the Conclusions. There is a lot of good stuff in this paper, so it's worth taking some time on. The other paper is a set of abstracts and copies of overheads from a short course taught in Vancouver a couple of years ago - it is more specific to the Sullivan deposit, and is basically just some illustrative stuff.

Caroline and Chan are the sacrificial goats (oops, I mean the speakers, of course!) for this week. Caroline's question is:

What is the evidence for prolonged extension in the miogeocline and what are the implications of this prolonged extension for the formation of SEDEX-type deposits?

Chan's question is:

SEDEX-type deposits in the Canadian Cordillera appear to have formed during several rather short time intervals. What might account for this?

ALL of you are supposed to be thinking about these questions while you are doing the reading, and you are expected to come to the seminar PREPARED TO DISCUSS THEM!!! John and I have been pretty underwhelmed by the level of participation from most of the people in the group. Remember, any question or comment is quite acceptable; you are among friends (well, mostly at least!), and no one is going to think you're dumb if you are confused about something. John and I certainly don't know all the answers, and in fact in most cases there ARE no "right" answers, so don't be afraid to ask questions, or challenge some point that comes up in the readings or in the discussion if you think it doesn't make sense. A part of your grade is based on your participation in the discussion, so.....

Implica of prolonged extension
- syn-rift basins early
- sag-rift basins later

Evidence for long-lived extension
- Mid Prot troughs
  - Uinta (Utah; bounded by E-W lins)
  - Willow Ck ft (S margin of Belt basin, MT) E-trending
  - Basin where Unkar + Chuar groups deposited
    - Grand Canyon S/G, AZ
- Purcell equiv.

∴ a # of SW-, W-, + NW trending autocogens included in W NAm. margin from 1.2-1.7 Ga

Upper Mid-Prot. Sequence: Mackenzie Mt. S/G
- Pinguicula Gp (possibly correlative w/ Mack. Mt S/G) → its basal volcanic unit = equivalent to Coppermine River gp lavas → common rift-autocogen origin @ 1.2 Ga

Late Prot. (Windermere) Rifting
- variety of rock types
- abrupt facies changes
- mafic dykes widespread
- local evaporites
- thinning towards craton

evidence for rift origin

700-900 Ma hiatus between Mid + Late Prot. rifting
∴ the 2 events are unrelated

Late Prot rifting → possibly related to breakup of a supercontinent

Early Paleozoic → episodic rift

Mid E
- Richardson Trough (N YK): possible autocogen
  - may have connected w Hazen Trough (arctic)
- Mackwa Ranges: evidence of rifting
- Kechika trough: cb (NW aligned reefs) reefs bounded on both sides by deeper water sds

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Subject: This week's readings

Hi, folks -

The readings for next week's meeting are now in the box. The subject this week is the Cordilleran fold-and-thrust belt and implications for the deformation of SEDEX deposits and speculations on the origin of Mississippi Valley-type deposits. There are two papers; one is on MVT deposits generally and the other consists of excerpts from the chapter in the Can. Cord. DNAG volume on "Structural Styles". For the structure paper, read esp. the sections on Ancestral North America (Yukon portion thereof) by Gordey and Thompson, and the section on the Foreland Belt (up to the section on the Wernecke and Ogilvie Mtns.).

Stuart is up this week; his question (and everyone else's.....) is:

How has the style of deformation in various parts of the fold-and-thrust belt that stretches the whole length of the Canadian Cordillera been influenced by the geometry and nature of the Late Proterozoic/Early Paleozoic rifted margin (or has it....)?

The other questions for everyone to think about and be prepared to discuss are:

1. What would happen to a SEDEX-type deposit that was affected by fold-and-thrust style of deformation, and how would this impact on the interpretation of genesis of the deposit?

2. Is the "orogenic model" for the formation of MVT-type deposits totally bogus? What is the evidence for or against this model?

↳ for: Migr of fluids need a driving mechanism (Ozarks)

against. Pine Pt

Cheers, Jim

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Subject: Oops, forgot something...

Oh, yeah, you should also at least scan the section in the Monger and
Nokleberg paper that we looked at earlier on the juvenile terranes. They
also briefly deal with the Cache Creek problem as well as the
Kootenay/Ancestral North America problem.

Jim

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Subject: This week's seminar....at the last moment!

Hi, folks - My apologies for being ridiculously late in getting this stuff out to you. This week has been QUITE hectic, and with my illustrious colleague (who will remain unnamed) having decamped for a week, I have gotten pretty far behind! Anyway, we are supposed to talk about juvenile terranes this week, so what I propose is this: We will look a bit at a final aspect of the pericratonic terranes first, and discuss some work that has been done in SE B.C. that suggests that the Kootenay Terrane in that part of the world is mappably continuous with Ancestral North America - and what the implications are for the Yukon-Tanana and other pericratonic terranes. There is a short paper on the Kootenay Terrane and its contact relations in the box. Then we can discuss juvenile terranes generally, and in particular we can debate the "Cache Creek Problem" and the question of how it got into its present position. There are two short papers from Geology that present opposing views on this question in the box - one by Wernicke and Klepacki and one by Nelson et al. - I suggest that we just debate this question during the seminar, and not have any specific questions to think about (mainly because I can't think of any at the moment!).

Again, sorry about being so late in getting this out.

Cheers, Jim

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Subject: the LAST meeting!

A somewhat last-minute communication re. our last seminar on Monday night. Let's meet at 6:30 as we did last time. Beverages will be provided....

I put a couple of papers in the box at noon on Saturday; if you have a chance you should scan the Struik paper and look briefly at the model for mineralization proposed in the Beaudoin et al. paper (don't get hung up on the Pb isotope stuff in that paper; it's largely bogus!). Struik gives a nice overview of the relationship(s) between strike-slip faulting in the Canadian Cordillera and the formation of metamorphic core complexes. Beaudoin et al. present a model in which the increased heat flow associated with Eocene crustal extension in SE B.C. may have driven hydrothermal systems that formed a variety of Early Tertiary epigenetic vein deposits in that region. Topics for discussion on Monday will include:

1) How much of the crustal extension in the Canadian Cordillera can be explained by the "strike-slip fault/transfer zone" proposed by Struik, and how much (if any) requires other processes?

2) What is the potential for significant mineralization genetically related to the formation of metamorphic core complexes in the Canadian Cordillera and/or strike-slip faulting?

See you all on Monday.

Cheers, Jim

Maps Susan 266-6024