**AGU Fall 2001 Union Session Proposal**
**Environmental Colloids**

There is increasing evidence that environmental colloids (i.e., organic macromolecules and inorganic microparticles) affect the transport of natural metals and anthropogenic contaminants in hydrologic environments. Colloid generation, stability, and mobility are affected by biological, environmental, geochemical, geophysical, and hydrological processes. Aquatic colloids can facilitate both the removal from, and release into, natural water bodies (eg. estuaries, lakes, groundwater, surface water, and marine environments) of many trace contaminants, metals, radionuclides, and hydrophobic trace organics depending on the environmental conditions (e.g., solids to water ratio) (Honeyman and Santschi, 1989). Recent findings at high solids to water ratios (i.e., groundwater) emphasize the importance of colloids in facilitating transport of elements otherwise not readily mobilized. Colloids have been observed to form in variable redox environments and salt/fresh water interfaces; mobilize plutonium in the subsurface (Kersting et al., 1999, Honeyman, 1999) and other radionuclides (Bauer et. A., 2001); promote mobility of metals in stream water (Kimball, 2000), estuarine and marine environments (Guo et. al., 1997; 2000); and potentially clog fractured rock (Kessler and Hunt, 1999). Colloidal particles may be dislodged by seismic activity, altering hydrologic aquifer permeability and water quality of aquifers and streams (Tokunaga, (1999)). Humic acid colloids that sorb toxic metals may be continuously generated and persist for long periods in shallow groundwaters (Buckau and Kim, 2000). Colloidal gold deposition of biogenic origin was also recently proposed (Southam, 2000) as well as clay accumulation in submarine hydrothermal vents. Colloids, using micellular technology, are used to enhance oil recovery, minimize liquid contaminants in natural gas liquids, and in contaminant remediation with in-situ barriers. New insights into processes that control transport depend on rigorously tested methods, as well as the adaptations of innovations in other disciplines. This session will contain papers describing interdisciplinary scientific studies on colloidal transport in various environmental settings to compare recent advances in techniques, analytical models and findings.

*References cited (co-conveners listed in bold):*


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*Our justification for requesting a Union Session:*
A search for abstracts presented at the AGU Fall 2000 meeting using the keyword 'colloid' generated 17 abstracts in three AGU sections and the topic is relevant to five AGU Sections: Biogeosciences; Hydrology; Ocean Sciences; Seismology; Volcanology, Geochemistry, and Petrology. Given the wide interest and multidisciplinary nature of solving geoscience problems, we request consideration for a Union Session at the Fall 2001 meeting. For a half-day session, we estimate, based on past meetings, time will allow for approximately 12 oral presentations. In addition, we will organize a large number of poster presentations.

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