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**SEAFLOOR HYDROTHERMAL SYSTEMS ON THE GORDA AND  
JUAN DE FUCA RIDGES: IMPLICATIONS FOR THE FORMATION  
OF MASSIVE SULFIDE DEPOSITS**

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Dr. Zierenberg's research interests include the genesis of metallic ore deposits, controls on the geochemistry of hydrothermal systems, and stable isotope geochemistry. He has worked on active hydrothermal systems where the processes to mineral deposit genesis can be observed at the seafloor, and on ancient ore deposits where the time integrated record of these processes can be examined in three dimensions. Drilling into the Middle Valley hydrothermal system during ODP Leg 139 (Sedimented Ridges) provided the first opportunity to investigate the process occurring below the seafloor in an active hydrothermal system. Previous field investigations have established that many volcanogenic massive sulfide deposits formed contemporaneously with their host rocks and were deposited on the seafloor by submarine geothermal systems. Using examples from his work on Leg 139, Dr. Zierenberg will discuss how drilling into active hydrothermal systems is helping to unravel the complex series of events that occur between formation of ore deposits and the eventual recovery of those resources.