Chapter 10

Late Devonian Sequence and Event Stratigraphy Across the Frasnian-Famennian (F-F) Boundary, Utah and Nevada

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1. INTRODUCTION

The biostratigraphy, sedimentology, sequence stratigraphy, and
geochemistry of the late Frasnian (F-F) mass extinction, one of the five
largest in the Phanerozoic record (Sepkoski, 1982, 1996), have been studied
intensely during the past two decades. Short-term, step-wise extinction prior
to and at the F-F boundary is associated with an abrupt reduction in global
biomass and loss of up to 82% of marine tropical to subtropical species
(Jablonski, 1991). The crisis simultaneously affected genetically and
ecologically diverse groups of planktic, benthic, and nektic organisms
representing virtually all trophic levels of the tropical marine biosphere.

These biologic changes were superimposed on a backdrop of rapid sea-
level fluctuations, marked intervals of anoxic and dysoxic marine
sedimentation, and significant increases in organic carbon burial and
recycling accompanying major worldwide excursions or spikes in the
geochemical record (e.g., Buggisch, 1972, 1991; Sandberg *et al.*, 1988;
Goodfellow *et al.*, 1989a, 1989b; Joachimski and Buggisch, 1993, 2000,
2002; Wang *et al.*, 1996; Joachimski, 1997; Bratton *et al.*, 1999; Joachimski
*et al.*, 2002).

Correlation of F-F boundary strata and contained event units is aided by
detailed conodont biostratigraphy, which currently provides the highest
resolution tool for regional to intercontinental correlations (e.g., Sandberg
Individual Late Devonian conodont zones range from approximately 300 to
700 kyr in duration, averaging 500 kyr (Fig. 1; Ziegler and Sandberg, 1994;
Sandberg and Ziegler, 1996). Even finer local to regional time resolution is