

ESTABLISHED
IN 1818
BY
BENJAMIN
SILLIMAN



AN
INTERNATIONAL
EARTH
SCIENCE
JOURNAL

EDITORS

JAY J. AGUE

DANNY M. RYE

ASSOCIATE EDITORS

TO SERVE UNTIL JANUARY 1, 2007

ETHAN F. BAXTER
BOSTON, MASSACHUSETTS
MARK T. BRANDON
NEW HAVEN, CONNECTICUT
JOHN M. FERRY
BALTIMORE, MARYLAND
JOHN I. GARVER
SCHENECTADY, NEW YORK
JEFFREY J. PARK
NEW HAVEN, CONNECTICUT

DENNIS K. BIRD
STANFORD, CALIFORNIA
WILLIAM R. DICKINSON
TUCSON, ARIZONA
BARB DUTROW
BATON ROUGE, LOUISIANA
GRANT GARVEN
BALTIMORE, MARYLAND
ALAN BRUCE THOMPSON
ZURICH, SWITZERLAND

TO SERVE UNTIL JANUARY 1, 2008

EDWARD W. BOLTON
NEW HAVEN, CONNECTICUT
JAMES CONNOLLY
ZURICH, SWITZERLAND
TIMOTHY W. LYONS
RIVERSIDE, CALIFORNIA
JILL D. PASTERIS
ST. LOUIS, MISSOURI

WILLIAM H. CASEY
DAVIS, CALIFORNIA
CRAIG MANNING
LOS ANGELES, CALIFORNIA
JOAQUIN RUIZ
TUCSON, ARIZONA
RICHARD J. WALKER
COLLEGE PARK, MARYLAND

TO SERVE UNTIL JANUARY 1, 2009

PAUL AHARON
TUSCALOOSA, ALABAMA
PHILIP D. GINGERICH
ANN ARBOR, MICHIGAN
STEPHEN C. PORTER
SEATTLE, WASHINGTON

ZACHARY SHARP
ALBUQUERQUE, NEW MEXICO
ANDREAS LUTTGE
HOUSTON, TEXAS
STEVEN M. STANLEY
HONOLULU, HAWAII

JOHN W. VALLEY
MADISON, WISCONSIN

TO SERVE UNTIL JANUARY 1, 2010

ROBERT A. BERNER
NEW HAVEN, CONNECTICUT
C. PAGE CHAMBERLAIN
STANFORD, CALIFORNIA
MARK S. GHIORSO
SEATTLE, WASHINGTON

DONALD E. CANFIELD
ODENSE, DENMARK
DARREL S. COWAN
SEATTLE, WASHINGTON
FRANK J. PAZZAGLIA
BETHLEHEM, PENNSYLVANIA

PETER REINERS
NEW HAVEN, CONNECTICUT

AMERICAN JOURNAL OF SCIENCE
KLINE GEOLOGY LABORATORY
YALE UNIVERSITY
NEW HAVEN, CONNECTICUT

Published 10 times a year
ISSN: 0002-9599
AJSCAP 306(3) 135-210(2006)