GEOLOGICAL SURVEY OF ALABAMA
Berry H. (Nick) Tew, Jr.
State Geologist

GEOLOGIC INVESTIGATIONS PROGRAM
Sandy Ebersole

EAST GULF COASTAL PLAIN STRATIGRAPHIC RECONCILIATION INITIATIVE ANNUAL REPORT, YEAR 2

Open-File Report 2304

by

Sandy M. Ebersole, Gregory M. Guthrie, Ben E. Byerly, and Andrew H. Hindman

Prepared by the Geological Survey of Alabama
in cooperation with the
U.S. Geological Survey, Geologic Framework Initiative

East Gulf Coast Stratigraphic Reconciliation Project, Year 2
Cooperative Agreement Number G21AC10658

Tuscaloosa, Alabama
2023

CONTENTS

FIGURES

EAST GULF COASTAL PLAIN STRATIGRAPHIC RECONCILIATION INITIATIVE, ANNUAL REPORT, YEAR 2

By

Sandy M. Ebersole, Gregory M. Guthrie, Ben E. Byerly, and Andrew H. Hindman

INTRODUCTION

The Geological Survey of Alabama (GSA) in partnership with the Mississippi Department of Environmental Quality Office of Geology (MDEQ) and the Florida Geological Survey (FGS) are conducting a tri-state stratigraphic correlation initiative with funding from the U.S. Geological Survey (USGS) GeoFramework Initiative (GFI). The geology of the study area (fig. 1) includes the East Gulf Coastal Plain Cenozoic through Mesozoic lithostratigraphic sequence (surface to basement) across the Florida panhandle, Mississippi, and Alabama.

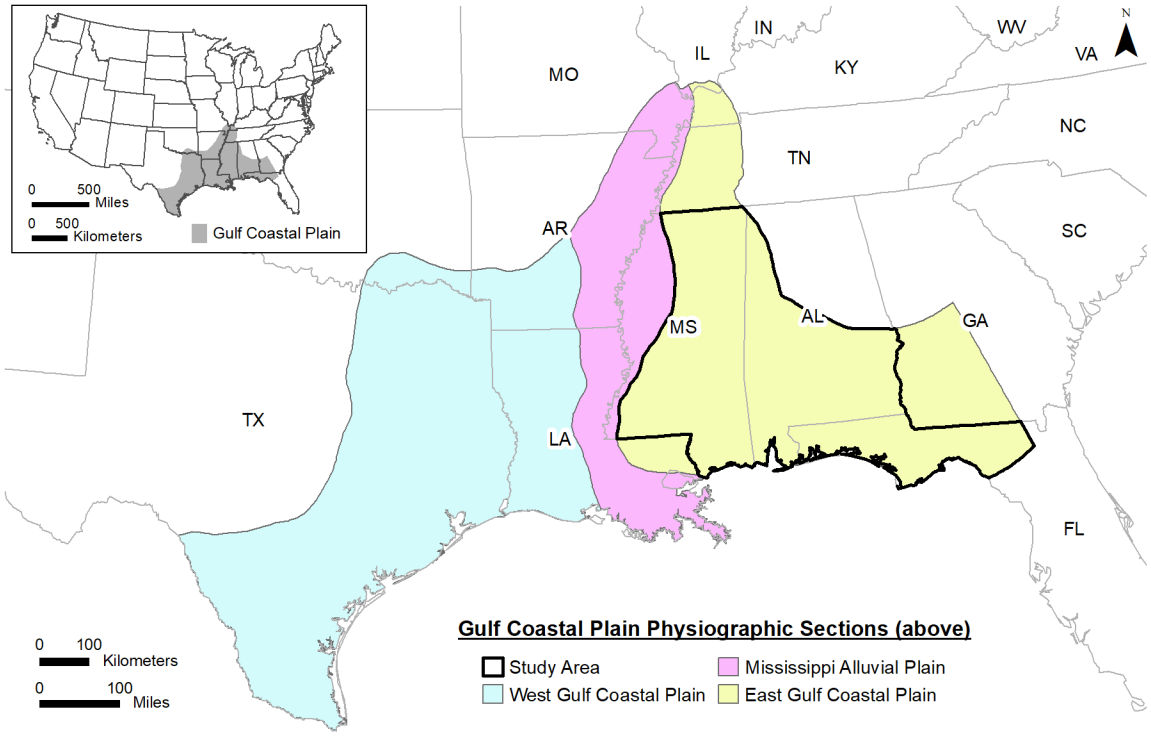

Figure 1.— The project study area (bold outline) in the East Gulf Coastal Plain (yellow) physiographic section in Mississippi, Alabama, and Florida panhandle, in relation to the larger Gulf Coastal Plain (gray on the inset map). Physiographic areas modified from Fenneman and Johnson, 1946.

ACCOMPLISHMENTS AND OBJECTIVES

The objectives of the working group for the second year of this project focused on identifying necessary changes to stratigraphic nomenclature, correlating lithostratigraphic units, and collaborating to perform those activities. Additional objectives included the following:

- Refining the details of planned project deliverables;
- Continuing to inventory and compile geophysical log data, publications, and other resources to support stratigraphic review, correlations, and reconciliations;
- Continuing frequent interstate discussions on issues identified;
- Early compilation of multi-state correlation chart graphics and graphic layout designs; and
- Compiling descriptions of each unit to be included in correlation charts, including information on type location, nomenclatural history, age range, lithology, geographic extent, key data, and references.

The next sections discuss some of the accomplishments in further detail.

RESOURCES FOR STRATIGRAPHIC CORRELATIONS

A number of resources have been used as sources of information and data useful in stratigraphic correlations along and across strike. These are beneficial for compiling new stratigraphic charts and cross sections for this project. Some of the resources applied in this second year of the project include the following:

- Literature such as publications, unpublished studies and reports, and field trip guidebooks;
- Unpublished and published in-state and regional stratigraphic charts;
- Water well drillers' logs;
- Geophysical well logs;
- Sample logs;
- Published and unpublished cross sections;
- Biostratigraphic data; and
- Geologic maps and lidar.

REGIONAL STRATIGRAPHIC CHARTS

Team members stayed in frequent contact during this reporting period, discussing and sharing published and unpublished state and regional stratigraphic charts; documents including publications and reports; water well and hydrocarbon well log data; interpretation of subsurface

correlations; and biostratigraphic and paleontological information. Early rough drafts of regional stratigraphic charts and cross sections were compiled and revised.

Hydrostratigraphic charts were also discussed, and older regional publications were compared. A USGS-based design was chosen upon which to model this project's new regional aquifer correlation charts.

Additional discussions and early layouts focused on stratigraphic units underlying geomorphic features, such as coastal terraces and the Daugherty karst terrain. These and their associated challenges were discussed in detail. Many resources were consulted and shared, including geologic maps, coastal geology publications, geomorphology publications, and lidar data for topographic surface correlations.

REGIONAL CROSS SECTIONS

The state surveys continued to import geophysical well logs (fig. 2) into software for correlations of unit tops and development of cross sections. Working group participants shared electric logs for water and oil and gas wells for interstate comparisons and to correlate tops from well to well in Neuralog and Petra software. Approximately 300 electric logs have been reviewed in the process of this project. Additionally, participants are examining core and sample logs and comparing those to outcrop lithologic descriptions and log signatures.

NOMENCLATURAL AND UNIT DOCUMENTATION

Information for lithostratigraphic units has been compiled from multiple sources and references to help document the geologic units in the study area and construct the regional stratigraphic charts. Details of each unit include type section location, age basis, geographic ranges, and other details. As the documents grow, they are shared with all the working group participants to edit and incorporate additional information specific to the unit in their state (for example, geographic extent, age variation, lithologic descriptions, and any key publications that may not be cited in Geolex). We have found this particularly helpful in identifying potential problem areas, future project topics, gaps in information, and more.

MANUSCRIPTS FOR STRATIGRAPHIC REVISIONS

Manuscripts are being drafted to address needed stratigraphic revisions. These manuscripts, when completed in the next reporting period, will be submitted to peer-review publication outlets. Some of the manuscripts are being formatted for submission to the USGS bulletin publication

Stratigraphic Notes. Examples of some of the manuscripts currently being compiled address changes to stratigraphic divisions to better correlate across state lines (for example, splitting the Lisbon Formation in Alabama into the four units recognized in Mississippi), proposed new names (e.g., for unnamed members), and suggestions for no longer using unit names that have not been widely accepted.

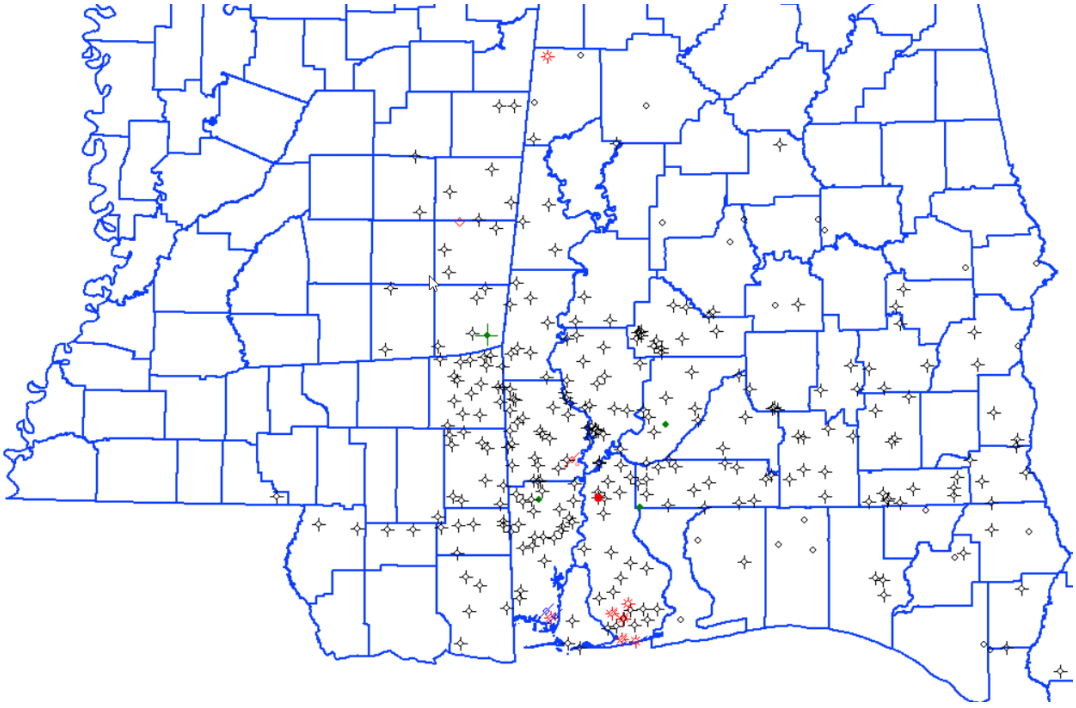

Figure 2.—A screen capture from the well log software Petra illustrating some of the locations of wells incorporated in the study area to assist in subsurface correlations and cross-section preparation. The symbols represent status of drilled oil and gas wells or water wells where geophysical logs have been evaluated.

WORKSHOP #2 PLANNING

Planning is underway for the next workshop. The second workshop will focus on reviews and needed changes with respect to the below items:

- Subsurface cross sections compiled from geophysical well logs and any needed revisions to these;
- Stratigraphic manuscripts for publications being written by working group members;
- The newest versions of the states and regional stratigraphic charts;
- Documentation of potential future projects between state surveys or between state surveys and USGS;
- Additional suggestions on the nomenclatural review documents;
- A regional hydrostratigraphic chart; and
- Additional topics for discussion as the three states recommend.

GOALS NOT YET MET

While the project's second year was productive, the anticipated rate of goals accomplished was reduced, due in part, to unexpected loss of staff. The GSA requested and was granted a 1-year extension for the project, with a new end date of June 12, 2024. Subcontracts between the GSA and the MDEQ and FGS were amended to reflect the new end date and signed by all parties. The second workshop is planned for the upcoming year, and remaining objectives to accomplish the deliverables are continuing to date.

ADDITIONAL INFORMATION

No additional costs or cost overruns are anticipated.

ANTICIPATED ACTIVITIES OR ADJUSTMENTS TO THE PROGRAM FOR THE NEXT BUDGET PERIOD

Planned activities for the next budget period will focus on completing the project. Tasks will include the following:

- Conducting additional virtual meetings to further discuss topics and updates;
- Hold Workshop #2;
- Complete all regional stratigraphic charts and cross sections;
- Complete hydrostratigraphic charts;
- Submit any remaining publications to USGS for units needing updates in Geolex;
- Complete compiling the nomenclatural review document;
- Complete compiling the document on potential future projects to address stratigraphic issues;
- Submit any publication manuscripts; and
- Submit the final deliverable report summarizing the project and its products.

REFERENCES CITED

Fenneman, N.M., and Johnson, D.W., 1946, Physiographic Divisions of the Conterminous U.S., U.S. Geological Survey Special Map, Washington, D.C., scale 1:7,000,000.

GEOLOGICAL SURVEY OF ALABAMA
420 Hackberry Lane
P.O. Box 869999
Tuscaloosa, Alabama 35486-6999
205/349-2852

Berry H. (Nick) Tew, Jr., State Geologist

A list of the printed publications by the Geological Survey of Alabama can be obtained from the Publications Office (205/247-3636) or through our website at http://www.gsa.state.al.us/.

E-mail: publications@gsa.state.al.us

Serving Alabama since 1848