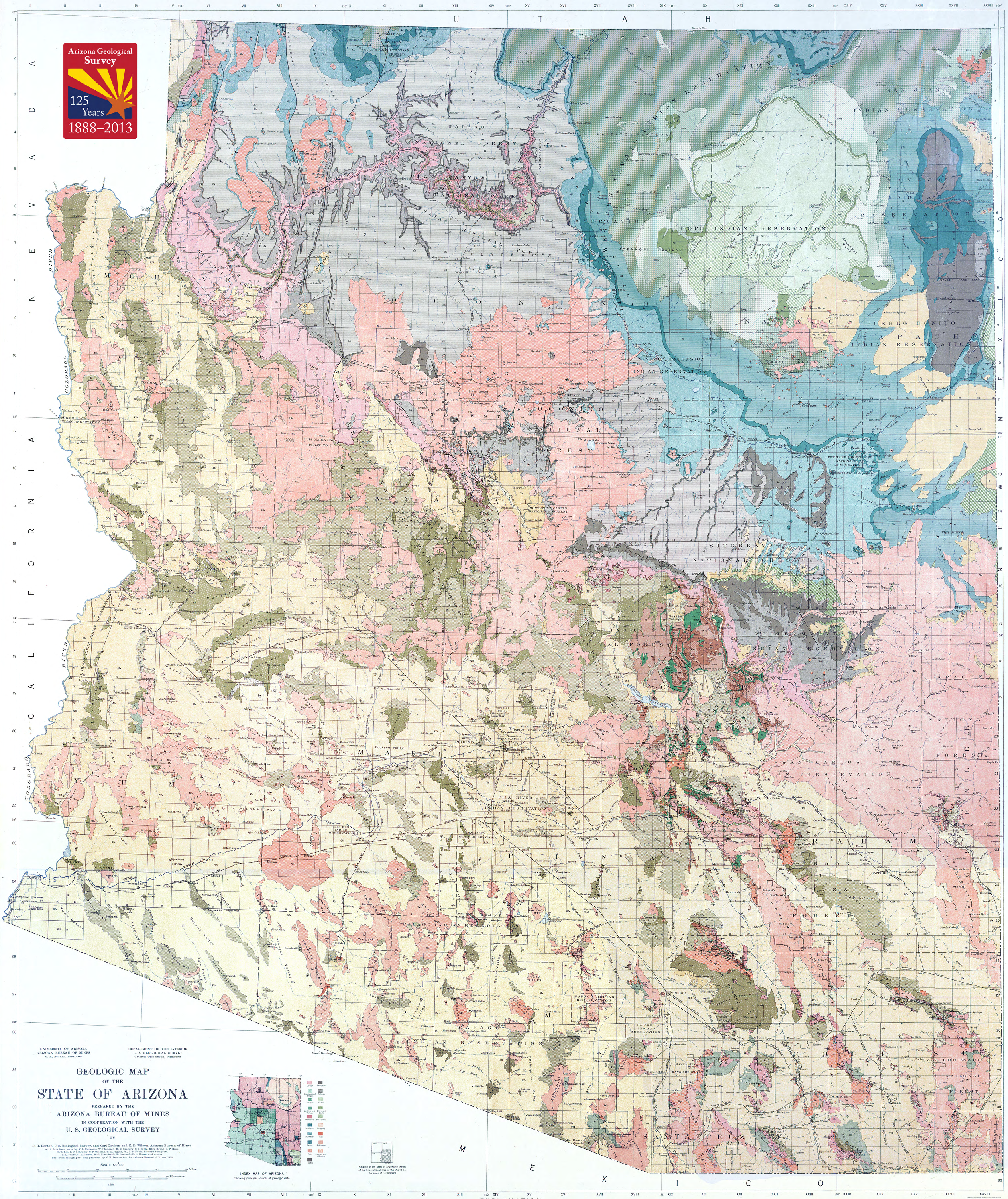
Arizona Geological Survey
125 Years
1888–2013



UNIVERSITY OF ARIZONA
ARIZONA BUREAU OF MINES
G. M. BUTLER, DIRECTOR

DEPARTMENT OF THE INTERIOR
U. S. GEOLOGICAL SURVEY
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GEOLOGIC MAP OF THE STATE OF ARIZONA

PREPARED BY THE
ARIZONA BUREAU OF MINES
IN COOPERATION WITH THE
U. S. GEOLOGICAL SURVEY

BY

N. H. Darton, U. S. Geological Survey, and Carl Lausen and E. D. Wilson, Arizona Bureau of Mines
with data from maps by F. L. Ransome, W. Lindgren, H. E. Gregory, C. J. Sarle, Kirk Bryan, C. P. Ross, W. T. Lee, F. C. Schrader, C. F. Tolman, T. A. Jagger, Jr., L. F. Noble, Edward Sampson, E. L. Jones, C. E. Dutton, R. C. Blanchard, B. Bancroft, R. C. Moore, and others

Base from topographic map prepared by N. H. Darton for the Arizona Bureau of Mines, 1923

Scale 500000

1924

INDEX MAP OF ARIZONA
Showing principal sources of geologic data

Relation of the State of Arizona to sheets of the International Map of the World on the scale of 1:1,000,000

EXPLANATION

SEDIMENTARY ROCKS

QUATERNARY AND TERTIARY

- QTs — Sand, gravel, and conglomerate (*Sediments of Quaternary and Tertiary ages, in southwestern part of the State, Chemehuevis and Temple Bar conglomerates*)
- Ts — Sand, gravel, and limestone (*Sediments of Tertiary age, lava flows and beds of tuff, in places in southeastern Arizona not mapped separately from Quaternary deposits*)

CRETACEOUS

Upper Cretaceous — Undivided

- Kmv — Mesaverde and later Cretaceous formations (*sandstone and shale with coal beds*)
- Km — Mancos shale (*Niobrara formation in Mesaverde and later formations in places on McElmo*)
- Kd — Dakota sandstone

Lower Cretaceous

- Kc — Comanche series (*shale, sandstone, and limestone*)

CRETACEOUS?

- Kmc — McElmo formation (*sandstone and thin shale; may be in part of Jurassic or Triassic rocks above the Navajo sandstone*)

JURASSIC

- Navajo sandstone and Todilto formation (Jurassic) and Wingate sandstone (Jurassic or Triassic) (*may include in places unclassified Jurassic rocks above the Navajo sandstone*)

TRIASSIC

Upper Triassic

- Rc — Chinle formation (*variegated shale, sandstone, and limestone conglomerate*)

Upper? Triassic

- Ts — Shinarump conglomerate

Lower Triassic

- Mm — Moenkopi formation (*red and chocolate-colored shale and sandstone*)

PERMIAN

- Ck — Kaibab limestone (*local sandstone members present in eastern Arizona*)
- Cc — Coconino sandstone

CARBONIFEROUS

- Cw — Supai formation (*overlying Hermit shale in Grand Canyon region not separately mapped*)

PERMIAN AND PENNSYLVANIAN

MISSISSIPPIAN AND DEVONIAN

- CDr — Redwall and related limestones (*Redwall limestone (Mississippian) including locally areas of Temple Butte limestone (Devonian) in northern Arizona; Redwall limestone (Mississippian) and Martin (Devonian) in northeastern Arizona; Redwall limestone (Mississippian) and Martin limestone (Devonian) in southeastern Arizona; Redwall and Muav limestones (Pennsylvanian and Mississippian) and Martin limestone (Devonian) in Clifton region*)

Early Devonian, Silurian, and part of Ordovician absent

ORDOVICIAN AND CAMBRIAN

- OCa — Abrigo and related limestones (*Abrigo limestone (Upper Cambrian) in southeastern Arizona; Longfellow limestone (Upper Cambrian) and Martin (? in Clifton region)*)

CAMBRIAN

Upper Cambrian

- Ct, Ct — Tonto group and related rocks (*Tonto group (Upper Cambrian) in northern Arizona, including Muav limestone, Frenchman Mountain sandstone, and the Tapeats sandstone, Ct; separately mapped in Grand Canyon region and Cornucopia quartzite*)

CAMBRIAN OR ALGONKIAN

Apache group — Undivided

- CAt — Troy quartzite (*locally overlain by Tapeats sandstone, Ordovician limestone, and Abrigo limestone, not separately mapped*)
- CAm — Mescal limestone (*includes at top local basalt lava flow*)
- CAdp — Dripping Spring quartzite, Barnes conglomerate, Pioneer shale, and Scanlan conglomerate

ALGONKIAN

- Ag — Grand Canyon series (*Chuar and Unkar groups composed of sandstone, limestone, and shale, with basalt flows and diabase sills*)

ARCHEAN?

- Ma — Mazatzal quartzite (*at north end of Mazatzal Mountains, south of Mogollon Mesa*)
- Ss — Schist (*includes Pinal schist in southeastern Arizona; Yavapai schist in central Arizona; small areas of greenstone in central Arizona; Vishnu schist (schist) in Grand Canyon region; and greenstone in southern and western Arizona*)

IGNEOUS ROCKS

QUATERNARY

- Qv — Younger volcanic rocks, mostly basalt lava flows (*in eastern part of State not everywhere separated from older lava flows*)

TERTIARY AND CRETACEOUS

- TKv — Older volcanic rocks (*dacite, latite, rhyolite, andesite, basalt, etc.; tuff, ash, breccia, and other fragmental material, including intrusive and sedimentary material and younger volcanic rocks not separately mapped*)

TERTIARY

- Tgr — Granite and porphyry (*intrusive rocks*)

CRETACEOUS

- Kgr — Granite, quartz monzonite porphyry, and diorite (*intrusive rocks; some pre-Cretaceous intrusives included at States*)

PRE-CAMBRIAN?

- db — Diabase (*intruded in Apache group; many small masses not shown*)

MOSTLY PRE-CAMBRIAN

- gr — Granite and related crystalline rocks (*small areas of schist, granitic rocks, and other igneous rocks of post-Paleozoic age included locally*)

Faults (*dotted where concealed by younger deposits; only the largest faults shown*)