interpreted as slaty metamudstone using geophysical and boring data from Lawrence and Hoffman (1993). Covered by Coastal Plain sedimentary deposits.

CRABTREE TERRANE

METAVOLCANIC AND METASEDIMENTARY UNITS

CZsph-gpb **Sericite phyllite interpreted from geophysical methods and boring data (Cambrian to Neoproterozoic)**—Area in subsurface interpreted as sericite phyllite using geophysical and boring data from Lawrence and Hoffman (1993). Located in the Crabtree terrane (?) in between the Nutbush Creek and Neuse River faults. Covered by Coastal Plain sedimentary deposits.

CZcimv-gp **Intermediate to mafic volcanics in the Crabtree terrane interpreted from geophysical methods (Cambrian to Neoproterozoic)**—Area in subsurface interpreted as Intermediate to mafic volcanic rocks using geophysical data from Lawrence and Hoffman (1993). Located in the Crabtree terrane (?) in between the Nutbush Creek and Neuse River faults. Covered by Coastal Plain sedimentary deposits.

UPPER LITTLE RIVER TERRANE

CZulrs **Upper Little River schist (Cambrian to Neoproterozoic)**—Silvery-gray, fine - to medium- crystalline, garnet + white mica schist. Garnets porphyroblasts up to 4 mm. Large portions of unit covered by Coastal Plain sedimentary deposits.

EASTERNMOST CAROLINA TERRANE

METAINTRUSIVE UNITS

BUCKHORN DAM META-INTRUSIVE SUITE

CZbg **Meta-granitoid rocks of the Buckhorn Dam intrusive suite (Cambrian to Neoproterozoic)**—Dark-colored (CI=15-30), medium- to fine-grained, metatonalite, metagranodiorite and metagranite with variably developed foliation; composed mainly of plagioclase, quartz, epidote, microcline, biotite, and opaque minerals, with minor amounts of sericite, sphene, chlorite, and garnet. The more felsic granitoid rocks are mineralogically and chemically similar to the felsic metavolcanic rocks described below, and are probably the intrusive equivalents. The unit includes a number of small granitoid bodies, probably originally dikes and plugs, intruding felsic metavolcanic rocks northeast of the main outcrops of Buckhorn Dam intrusive suite.

CZbg-lsp **Lemon Springs pluton of the Buckhorn Dam intrusive suite (Cambrian to Neoproterozoic)**—Leucocratic to mesocratic, medium- to fine-crystalline, metamorphosed alkali granite with variably developed foliation. In hand-sample, mineral boundaries are not well defined except for those of tabular albite crystals and small (0.5 to 2.0 mm) pods of dark minerals that are acicular stilpnomelane (Campbell 1984). According to Campbell (1984), the average major mineral constituents from point counts are microcline (34%), quartz (31%), and albite (27%). Minor amounts of epidote, stilpnomelane, biotite, chlorite, white mica,

garnet, opaques, sphene, calcite, apatite, allanite, and pyrite are present, in order of decreasing abundance (Campbell, 1984). The Lemon Springs quarry also hosts, low-silica, high-potassium dikes that may represent metamorphosed lamprophyre and metamorphosed felsic and basaltic dikes (Campbell, 1984).

CZbg-rd **Rhyodacite to dacite of the Buckhorn Dam intrusive suite (Cambrian to Neoproterozoic)**—Gray, aphanitic, vitiric-like, flow-banded metamorphosed rhyodacite to dacite. May be an apophysis of the Lemon Springs pluton (?).

CARY METAMORPHIC SUITE

CZbr3 **Big Lake-Raven Rock schist 3 (Cambrian to Neoproterozoic)**—Light tan to orange-brown, fine- to medium-grained, white mica schist, phyllite and gneiss. Locally preserves primary volcanic texture, either fragmental or porphyritic. Inferred to have a dacitic volcanic and/or volcaniclastic protolith. Locally includes intermediate to mafic composition rocks that have been metamorphosed to mica phyllite.

CZbr-py **Phyllite and argillite (Cambrian to Neoproterozoic)**—Fine- to medium-crystalline phyllite and metamorphosed siltstones. Locally preserves primary sedimentary textures (bedding and crystal fragments). Tuffaceous interlayers present. May be a more distal and finer-grained facies related to Big Lake-Raven Rock schist units. Differentiated from unit to southwest (CZsphs-gpb) due to abundance of high magetic signature bodies on Piedmont Bridge South Magnetic and Radiometric Survey (preliminary data, 2025). Large portions of unit covered by

Coastal Plain sedimentary deposits.

CZsphs-gpb **Sericite phyllite and metamorphosed sedimentary rocks interpreted by geophysical methods and boring data (Cambrian to Neoproterozoic)**—Area in subsurface interpreted as mainly sericite phyllite using geophysical and boring data from Lawrence and Hoffman (1993). Includes lesser amounts of fine-grained metamorphosed sedimentary rocks and metamorphosed granitoid. Northeast contact of unit is questionable and designates apparent contact between rocks of lower magnetic intensity to the southwest from rocks of higher magnetic intensity to the northeast. Outcrops in limited exposed areas include: phyllite, meta-rhyodacite, schistose phyllite and gneissic granitoid. Majority of unit is covered by Coastal Plain sedimentary deposits.

CZmas **Mafic schist and phyllite and sericite phyllite (Cambrian to Neoproterozoic)**—Green, chlorite-actinolite schist, chlorite schist and sericite phyllite. Schist grade into dark green intermediate to mafic crystal tuffs. intercalated lithologies include epidosite, hematite rich epidote-quartzite breccia and chlorite phyllite. Small pyrite crystals are commonly found along the fine-grained quartz laminae. Hematite also commonly present. Small lenses of quartzo-feldspathic gneiss are intercalated with the unit. (Modified from Hicks, 1982)

CZimv-gp **Intermediate to mafic volcanics in the Easternmost Carolina terrane interpreted from geophysical methods (Cambrian to Neoproterozoic)**—Area in subsurface interpreted as Intermediate to mafic volcanic rocks using geophysical data from Lawrence and

Hoffman (1993). Located in the Easternmost Carolina terrane. Covered by Coastal Plain sedimentary deposits.

CAROLINA TERRANE

ALBEMARLE ARC

CZq **Quartz veins (Cambrian to Neoproterozoic)**—Area of abundant quartz present in a vein or set of veins. May include silicic alteration of country rock. Often vuggy texture present with terminating crystals.

ALBEMARLE ARC PLUTONS

CZagb-sm **Stony Mountain Gabbro (Cambrian to Neoproterozoic)**—Massive, grayish-green to dark-greenish-gray, fine to coarse grained. Composed of secondary amphibole, in part with cores of clinopyroxene, calcic plagioclase, epidote, chlorite, and quartz, with accessory sphene, apatite, calcite, phlogopite, and opaque minerals. Occurs as sheets, dikes, and irregular intrusive bodies; most common within well-bedded sedimentary and volcanic rocks. The sheet exposed west of Back Creek Lake has a basal zone rich in serpentine pseudomorphs after olivine; "comb layering" (Moore and Lockwood, 1973) is well exposed in the quarry at the top of the same sheet (Seiders and Wright, 1977). A sample collected from Ridges Mountain (west of Asheboro) in the unit yielded an age of ca. 545 Ma (DeDecker et al., 2013).

Zagd-p **Granodiorite of the Parks Crossroads pluton (Neoproterozoic)**—Leucocratic (CI=5) , fine- to medium- grained, equigranular metamorphosed, granodiorite. Mineral assemblage includes quartz, plagioclase, and

green hornblende +/- chlorite, +/- epidote. Locally foliated in the Southern Pines 100K. A sample collected from an abandoned quarry in the unit in the Chapel Hill 100K yielded a weighted mean age of ca. 552 Ma (Morrison and Coleman, 2023). Contact with Hyco arc units interpreted as an intrusive contact. Contact with portions of the Seagrove formation units may be an unconformity based on preliminary detrital zircon data. Additional work is needed to confirm.

MORROW MOUNTAIN RHYODACITE SUITE

CZmmr-ps **Morrow Mountain rhyodacite – porphyritic felsite near Seagrove (Cambrian to Neoproterozoic)**—Gray, rhyodacite (felsite of Seiders, 1981) with phenocrysts of albite and quartz. Occurs in a 3 km-wide belt and in small bodies on both sides of the belt. At the south end of the belt the felsite is flow layered, locally spherulitic, and the phenocrysts are relatively smaller and less abundant. To the north, in Randolph County, phenocrysts are larger (1-3 mm) and more abundant; flow layering and spherulites are generally absent. Both extrusive and shallow intrusive rocks may be represented. A sample collected from the southbound I-73/74 visitor center approximately 1.9 miles southwest of Seagrove in the Chapel Hill 100K yielded a LA-ICP-MS 206Pb/238U weighted means age of ca. 536 Ma (Bradley et al., 2025).

CZmmr-psa **Altered Morrow Mountain rhyodacite – porphyritic felsite near Seagrove (Cambrian to Neoproterozoic)**—Light gray quartzose sericite phyllite; locally contains pyrite; commonly iron oxide-stained where weathered. Pyrophyllite locally present. Interpreted as hydrothermally

altered CZmmr-ps unit.

CZmmr-f **Morrow Mountain rhyodacite – felsite (Cambrian to Neoproterozoic)**—Light-gray to dark-gray rhyodacite (felsite of Seiders, 1981), aphanitic to porphyritic with phenocrysts of albite and quartz. Locally spherulitic and flow layered. May include lava flows, domes, necks, and dikes. Bradley et al. (2025), reported LA-ICP-MS 206Pb/238U weighted means age for a sample from Caraway Mountain in the Chapel Hill 100K of ca. 543 Ma. See table 1 for additional dates.

ALBEMARLE GROUP

TILLERY FORMATION

CZtm **Laminated to thin-bedded graded mudstone (Cambrian to Neoproterozoic)**—Typically grayish-green, less commonly gray, in beds 1 mm to 4 cm thick. Beds grade upward from lighter colored siltstone to darker claystone. Beds are extremely regular, laterally persistent, and show no crossbedding. Thick-bedded mudstone is uncommon. Rare beds of graded sandstone consist of volcanic rock and mineral fragments of diverse composition in an abundant argillaceous matrix. Contains biotite porphyroblasts

CZtfm **Felsite, felsic volcaniclastic rocks and interbedded, laminated- to thin-bedded mudstone (Cambrian to Neoproterozoic)**—Felsite, felsic volcaniclastic rocks, and interbedded, laminated- to thin-bedded mudstone

CZtimv **Intermediate to mafic volcanics in the Tillery Formation (Cambrian to**

Neoproterozoic)—Map scale bodies of metamorphosed gray-green, dark green and greenish-gray; typically unfoliated to weakly foliated, amygdaloidal, plagioclase porphyritic and aphanitic; andesitic to basaltic lavas and shallow intrusions. Hyaloclastic texture is common and imparts a fragmental texture on some outcrops and float boulders. Correlated with Ctb (basaltic rocks) of Stromquist and Henderson (1985).

CZtmc **Mafic volcaniclastic rocks (Cambrian to Neoproterozoic)**—Thin- to very thick bedded, grayish-green tuff, lapilli tuff, and tuff breccia. In addition to mafic volcanic debris, many rocks contain subordinate amounts of mudstone and felsic volcanic rock clasts

SEAGROVE FORMATION (INFORMAL)

CZsfc **Seagrove formation felsic volcaniclastic rocks (Cambrian to Neoproterozoic)**—Thin- to very thick bedded, light- to dark-gray, in part pale-green, tuff, lapilli tuff, and tuff breccia. The most abundant rock types are very thick bedded tuff, lapilli tuff, and tuff breccia, but in many parts of the map unit subordinate amounts of well-bedded, thin- to thick-bedded, in part graded, tuff, tuffaceous sandstones, tuffaceous conglomeratic sandstones and felsic volcanic mudstone are interbedded. In many rocks the principal clasts are dense felsite, like that occurring in the numerous felsite bodies of the formation. Clasts are angular to subrounded, very rarely well rounded. Other rocks have clasts with poorly preserved textures that are strongly suggestive of pumice. Such rocks occur throughout the unit but are especially

abundant in a 3 km wide belt, extending from south of Center Cross Church to Purgatory Mountain and located just west of the belt of porphyritic felsite at Seagrove (CZmmr-ps). These rocks generally lack interbeds of well-bedded tuff and may represent thick ashflow deposits. The probable pumice fragments are commonly much flattened but the flattening is in the plane of the regional cleavage or foliation and may be tectonic. Textural details are too poorly preserved to record most features that would clearly indicate welding.

CZsehc **Seagrove formation epiclastic rocks of the Harpers Crossroads area (Cambrian to Neoproterozoic)**—Metasedimentary package that ranges from fine-grained siltstones to coarse-grained sandstones, pebbly sandstones and conglomerates. The sandstones, pebbly sandstones and conglomerates commonly contain rounded to subangular clasts of quartz ranging from sand- to gravel-sized. In the sandstones, feldspar is the most prominent mineral grain; quartz varies from sparse to abundant in hand sample. Lithic clasts are typically prominent and range from sand- to gravel-size. Previously mapped as part of the Aaron Formation on open file maps of western Chatham County.

CZsehc-a **Altered Seagrove formation epiclastic rocks of the Harpers Crossroads area (Cambrian to Neoproterozoic)**—Area of Seagrove formation epiclastic rocks of the Harpers Crossroads area that is mildly to moderately hydrothermally altered. Alteration consists of silicified, sericitized and pyrophyllitized rock. Chloritoid locally present.

CZseb **Seagrove formation epiclastic rocks of the Biscoe area (Cambrian to**

Neoproterozoic)—Metasedimentary package that is dominantly fine- to medium-grained siltstones and sandy siltstones with local quartz bearing sandstones and pebbly sandstones. Lesser amounts of conglomerate. The sandstones and pebbly sandstones commonly contain rounded to subangular sand-size grains of quartz. Quartz grains appear to be less abundant than in CZsehc. In the sandstones, feldspar is the most prominent mineral grain; quartz varies from sparse to abundant in hand sample. When present, lithic clasts range from sand- to gravel-size and locally include pink-colored, angular clasts of altered (?) rhyodacite. Minor andesite to basalt lavas and/or shallow intrusions.

CZseb-a **Altered Seagrove formation epiclastic rocks of the Biscoe area (Cambrian to Neoproterozoic)**—Mixed unit of altered volcaniclastic sedimentary rocks within the CZseb unit. Alteration consists of silicified, sericitized and pyrophyllitized rock. Sulfides locally present. Vuggy quartz boulders and cobbles abundant throughout unit. Includes altered rhyodacite (CZmmr-f) that was likely emplaced as dikes.

CZsebimv **Seagrove formation epiclastic rocks of the Biscoe area with local intermediate to mafic volcanics (Cambrian to Neoproterozoic)**—Metasedimentary package that is dominantly fine- to medium-grained siltstones and sandy siltstones with local quartz bearing sandstones and pebbly sandstones identical to CZseb with local to abundant metamorphosed andesite to basalt lava and/or shallow intrusions. Local occurrence of metarhyodacite of CZmmr-f present.

CZsebimv-a **Altered Seagrove formation epiclastic rocks of the Biscoe area with**

local intermediate to mafic volcanics (Cambrian to Neoproterozoic)—Variably altered metasedimentary package that is dominantly fine- to medium-grained siltstones and sandy siltstones with local quartz bearing sandstones and pebbly sandstones with local to abundant metamorphosed andesite to basalt lava and/or shallow intrusions identical to CZsebimv. Includes phyllitic siltstone. Altered rock includes: sericite +- pyrophyllite phyllite and abundant vuggy quartz veins. Includes areas of the historic Golconda, Uwarra, Iola and Martha Washington gold mines. Area is deeply weathered with only the most resistant rocks forming outcrops.

CZsimv **Seagrove formation intermediate to mafic volcanic rocks (Cambrian to Neoproterozoic)**—Map scale bodies of metamorphosed light green, gray-green, gray, and dark gray; typically unfoliated to weakly foliated, amygdaloidal, plagioclase porphyritic and aphanitic; andesitic to basaltic lavas and shallow intrusions. Hyaloclastic texture is common and imparts a fragmental texture on some outcrops and float boulders.

CZsimvc **Seagrove formation intermediate to mafic volcanic and volcaniclastic rocks (Cambrian to Neoproterozoic)**—Map scale bodies of metamorphosed andesitic to basaltic lavas and shallow intrusions (like CZsimv) with interlayered volcaniclastic rocks consisting of phyllitic siltstone to conglomerate.

CZsmd **Seagrove formation mudstones (Cambrian to Neoproterozoic)**—Grayish-green, light gray to dark gray, locally with distinctive reddish-gray or maroon to lavender coloration, metamorphosed, thinly bedded

mudstone, siltstone and sandy siltstone. Mudstone bedding ranges from mm-scale up to 10 cm, bedding layers traceable for several feet locally, may exhibit soft sediment deformation. Locally tuffaceous with a relict vitric texture. When present, crystal fragments are usually plagioclase with rare quartz. Deposition interpreted as distal from volcanic center.

CZse/pl **Seagrove formation epiclastic and pyroclastic rocks with rhyrodacitic domes of the Robbins area (Cambrian to Neoproterozoic)**—Gray to greenish-gray, metamorphosed tuffaceous sandstones, conglomeratic sandstones, siltstones and local interbeds of mudstone. Contains lesser amounts of fine- to coarse tuff, welded tuff and rhyodacitic lavas/shallow intrusions. The siltstones typically are weakly phyllitic. Fiamme-like shaped clasts are common in the conglomeratic sandstones, sandstones and tuffs. Quartz and feldspar crystal fragments are common in the sedimentary components, tuffs and lavas. Silicified and/or sericitized altered rock and quartz veining present. Interpreted as a felsic sedimentary package deposited contemporaneous with local felsic volcanism. Correlates to Unit 2 of Powers (1993).

CZshar **Seagrove formation hydrothermally altered rocks (Cambrian to Neoproterozoic)**—Areas within the Seagrove formation of moderate to intense hydrothermally altered rock. Alteration consists of silicified, sericitized and pyrophyllitized rock. Chloritoid locally present. Sulfides are common. Primary sedimentary or volcanic textures are commonly

obliterated. Includes the moderate argillic (sericite) alteration zone in the Robbins area as described by Powers (1993).

CZshar-pqs **Pyrophyllite-quartz-sericite hydrothermally altered rocks (Cambrian to Neoproterozoic)**—Zones of intense hydrothermally altered rock with pyrophyllite. Include zones of pyrophyllite-quartz +-sericite alteration. Primary sedimentary or volcanic textures are obliterated. Includes active, inactive and abandoned pyrophyllite mines and prospects. After Powers (1993).

CZshar-qsh **Quartz-sericite-hematite hydrothermally altered rocks (Cambrian to Neoproterozoic)**—Zones of intense hydrothermally quartz-sericite-hematite altered rock. Includes silicified rock that may form resistant ridges in the Robbins area. According to Powers (1993), hematitic rocks have low to no detection of gold.

CZshar-qsp **Quartz-sericite-pyrite hydrothermally altered rocks (Cambrian to Neoproterozoic)**—Zones of intense hydrothermally quartz-sericite-pyrite altered rock. Includes silicified rock that may form resistant ridges in the Robbins area. According to Powers (1993), pyritic rocks have moderate (>100 ppb) to high (>1000 ppb) gold occurrence.

UWHARRIE VOLCANIC COMPLEX

CZurlt **Uwharrie Volcanic Complex rhyodacitic lavas and tuffs (Cambrian to Neoproterozoic)**—Gray to dark gray, siliceous, aphanitic rhyodacites and tuffs, quartz-bearing tuffs and quartz-rhyodacite porphyry. Rhyodacites and tuffs are vitric-like and weakly to moderately foliated. Rhyodacites are locally flow layered and(or) spherulitic. Phenocrysts of

albite are generally present, commonly accompanied by quartz. The size and abundance of phenocrysts varies widely. Tuffs locally contain fiamme-shaped clasts. May include lava flows, domes, necks , and dikes. Zuf, Felsite unit, of Seiders (1981).

CZufc **Felsic volcaniclastic rocks (Cambrian to Neoproterozoic)**—Thin- to very thick bedded, light- to dark-gray, in part pale-green, tuff, lapilli tuff, and tuff breccia. The most abundant rock types are very thick bedded tuff, lapilli tuff, and tuff breccia, but in many parts of the map unit subordinate amounts of well-bedded, thin- to thick-bedded, in part graded, tuff, tuffaceous sandstones, tuffaceous conglomeratic sandstones and felsic volcanic mudstone are interbedded. In many rocks the principal clasts are dense felsite, like that occurring in the numerous felsite bodies. Clasts are angular to subrounded, very rarely well rounded. Other rocks have clasts with poorly preserved textures that are strongly suggestive of pumice. These rocks generally lack interbeds of well-bedded tuff and may represent thick ashflow deposits. The probable pumice fragments are commonly much flattened but the flattening is in the plane of the regional cleavage or foliation and may be tectonic. Textural details are too poorly preserved to record most features that would clearly indicate welding.

CZuimcl **Intermediate to mafic volcaniclastic rocks and lavas (Cambrian to Neoproterozoic)**—Thin- to very thick-bedded, grayish-green tuff, lapilli tuff, and tuff breccia. Local occurrence of andesitic to basaltic lavas with hyaloclastic textures. Commonly contains scattered clasts of

felsic volcanic rock. Modified equivalent of CZumc of Seiders (1981).

CZuiml **Intermediate to mafic lavas (Cambrian to Neoproterozoic)**—Small bodies of metamorphosed andesite to basalt exposed chiefly in the northeastern part of the Seiders (1981) map area. Commonly amygdaloidal. Pillow lava occurs northeast of Asheboro, along the dead end road 1.5 km east of Oakie Mountain. May include some shallow intrusive rocks. Modified equivalent of CZuml of Seiders (1981).

CZuhar **Uwharrie Volcanic Complex hydrothermally altered rocks (Cambrian to Neoproterozoic)**—Areas within the Uwharrie Formation of moderate to intense hydrothermally altered rock. Alteration consists of silicified, sericitized and pyrophyllitized rock. Chloritoid locally present. Sulfides are common. Primary sedimentary or volcanic textures are usually obliterated.

ELLERBE AREA VOLCANICS AND VOLCANICLASTIC ROCKS

CZemd **Metamorphosed thin- to thickly-bedded mudstones of the Ellerbe area (Cambrian to Neoproterozoic)**—Green, grayish-green to gray, thin- to thickly-bedded (typically >1 cm thick) metamorphosed mudstone and siltstone ranging from felsic to mafic source material. Local occurrence of laminated mudstone and siltstone. Local interlayers of felsic tuff or tuffaceous siltstone present. Maybe related to the Cid Formation. New and unpublished LA-ICP-MS U-Pb detrital zircon ages from the unit include: maximum depositional ages (MDA) of 540 Ma for sample SP100K 551983 and MDA of 562 Ma for sample SP100K 551641.

CZeimvc **Metamorphosed intermediate to mafic volcanics and clastic rocks of**

the Ellerbe area (Cambrian to Neoproterozoic)—Metamorphosed intermediate to mafic volcaniclastic rocks and lavas with lesser mudstone and siltstone. Andesites and basalts locally display hyaloclastic and vuggy (interpreted as vesicles) texture. Local felsic sandstones present (similar in appearance to sandstones of the Seagrove formation). Likely a part of CZemd unit but with abundant intermediate to mafic volcanics and coarser-grained sediments.

CZelmd **Metamorphosed laminated mudstones of the Ellerbe area (Cambrian to Neoproterozoic)**—Grayish-green to gray, laminated to thin bedded (typically 1 mm to 1 cm thick) metamorphosed mudstone and siltstone. Beds are very regular and can be traced across the outcrop. Local interlayers of felsic tuff or tuffaceous siltstone present. Very similar in appearance to the Tillery Formation and may be equivalent. A new and unpublished LA-ICP-MS U-Pb detrital zircon age from the unit yields a maximum depositional age (MDA) of 543 Ma for sample SP100K 551786.

CONTACT AUREOLE OF THE LILESVILLE GRANITE

CZah-ex **Exterior aureole hornfels of the Lilesville Granite (Cambrian to Neoproterozoic)**—Mineralogy and color of rock varies with proximity to Lilesville Granite. In the extreme outer portions of the exterior aureole, the rocks are typical Carolina terrane metasediments with relict bedding with the presence of porphyroblasts of cordierite. As metamorphic grade increases closer to the granite, the rocks are hornfels that are grey, well-indurated with dark spots up to several millimeters (i.e. cordierite and other porphyroblasts). In the inner exterior aureole the

hornfels are black, dense and extremely well-indurated (may be confused with diabase). The mineral assemblage varies with location and may include cordierite, garnet, biotite, and other minerals. Relict bedding is locally preserved as faint striations on weathered surfaces. See Evans and Speer (1984) for detailed descriptions.

CZah-in **Interior aureole hornfels of the Lilesville Granite (Cambrian to Neoproterozoic)**—Gray to black, dense hornfels that vary in texture and mineral assemblages. Includes porphyroblasts of cordierite, garnet, biotite, scarce orthopyroxene, and other minerals. Locations with abundant biotite have a gneissic texture. See Evans and Speer (1984) for detailed descriptions.

CZah-mig **Migmatized interior aureole hornfels of the Lilesville Granite (Cambrian to Neoproterozoic)**—Gray to black, migmatized hornfels. Resemble polydeformed gneisses associated with regional metamorphism. Include zones of leucosomes, ptygmatically folded leucosome veins and boudins. Minerals include cordierite, garnet, biotite, sillimanite, and other minerals. See Evans and Speer (1984) for detailed descriptions.

HYCO ARC

HYCO FORMATION - UPPER PORTION

HYDROTHERMALLY ALTERED UNITS

Zhhar **Hydrothermally altered rocks (Neoproterozoic)**—Mixed unit of hydrothermally altered rocks consisting of: dense siliceous

cryptocrystalline rock; quartz-pyrophyllite rocks, +- kaolinite, andalusite, chloritoid, sericite, paragonite and iron oxides; quartz-sericite rocks, +- paragonite, k-feldspar and iron oxides; and quartz-chloritoid-chlorite rocks, +- sericite and hematite. Described in detail by Hughes (1987) and Schmidt et al. (2006).

Zhat/vcs **Altered tuffs and volcaniclastic sedimentary rocks (Neoproterozoic)**—Mixed unit of altered volcaniclastic rocks and volcaniclastic sedimentary rocks. Alteration consists of silicified, sericitized and pyrophyllitized rock. Chloritoid locally present. Volcaniclastic sedimentary rocks include conglomeratic siltstone to conglomerate that may be variably altered. Includes area of quartz-sericite-paragonite rock (Zvqs) of Schmidt et al. (2006). Andesitic to basaltic lavas and massive quartz locally present.

Zhe/pl-a **Altered mixed epiclastic-pyroclastic rocks with interlayered dacitic lavas (Neoproterozoic)**—Area of unit Zhe/pl that is mildly to moderately hydrothermally altered. Alteration consists of silicified, sericitized and pyrophyllitized rock. Intensity of alteration varies locally.

VOLCANOCLASTIC-SEDIMENTARY UNITS

Zhe/pl **Mixed epiclastic-pyroclastic rocks with interlayered dacitic lavas (Neoproterozoic)**—Mixed epiclastic-pyroclastic rocks with interlayered dacitic lavas: Grayish-green to greenish-gray, locally with distinctive reddish-gray or maroon to lavender coloration; metamorphosed: conglomerate, conglomeratic sandstone, sandstone, siltstone and mudstone. Lithologies are locally bedded; locally tuffaceous with a

cryptocrystalline-like groundmass. Siltstones are locally phyllitic. Locally contain interbedded dacitic lavas identical to Zhdlt unit. Contains lesser amounts of fine- to coarse tuff and lapilli tuff with a cryptocrystalline-like groundmass. Pyroclastics, lavas, and epiclastics are mainly felsic in composition. Minor andesitic to basaltic lavas and tuffs present. Silicified and/or sericitized altered rock are locally present. Conglomerates and conglomeratic sandstones typically contain subrounded to angular clasts of dacite in a clastic matrix. Portions of the Zhe/pl unit are interpreted to have been deposited proximal to active volcanic centers represented by the Zhdlt unit but are also interpreted to record the erosion of proximal volcanic centers after cessation of active volcanism.

FELSIC TO INTERMEDIATE VOLCANIC UNITS

Zhdlt (u) **Dacitic lavas and tuffs of the upper portion of the Hyco Formation (Neoproterozoic)**—Greenish-gray to dark gray, siliceous, aphanitic dacite, porphyritic dacite with plagioclase phenocrysts, and flow banded dacite. Dacite with hyaloclastic textures are common. Welded and non-welded tuffs associated with the lavas include: greenish-gray to grayish-green, fine tuff, coarse plagioclase crystal tuff and lapilli tuff. Locally, interlayers of immature conglomerate and conglomeratic sandstone with abundant dacite clasts are present. The dacites are interpreted to have been coherent extrusives or very shallow intrusions associated with dome formation. The tuffs are interpreted as episodic pyroclastic flow deposits, air fall tuffs or reworked tuffs generated

during formation of dacite domes. The unit occurs as map scale pods surrounded by clastic rocks of Zhe/pl unit. Wortman et al. (2000) reports an age of 615.7+3.7/-1.9 Ma U-Pb zircon date for a dacitic tuff from the unit in the Rougemont quadrangle in the Henderson 100K.

INTERMEDIATE TO MAFIC VOLCANOCLASTIC-SEDIMENTARY UNITS

Zhime/pl **Mixed intermediate to mafic epiclastic-pyroclastic rocks with interlayered intermediate to mafic lavas (Neoproterozoic)**—Grayish-green to green, locally with distinctive reddish-gray or maroon to lavender coloration; metamorphosed: conglomerate, conglomeratic sandstone, sandstone, siltstone and mudstone. Lithologies are locally bedded; locally tuffaceous with a cryptocrystalline-like groundmass. Siltstones are locally phyllitic. Locally contain interbedded intermediate to mafic lavas identical to Zhablt, Zhabl, and Zhablc units. Contains lesser amounts of fine- to coarse tuff and lapilli tuff with a cryptocrystalline-like groundmass. Pyroclastics, lavas, and epiclastics are mainly intermediate to mafic in composition. Minor dacitic lavas and tuffs present. Silicified and/or sericitized altered rock similar to Zhat unit are locally present. Conglomerates and conglomeratic sandstones typically contain subrounded to angular clasts of andesite and basalt in a clastic matrix. Generally interpreted to have been deposited proximal to active intermediate to mafic composition volcanic centers and/or record the erosion of proximal intermediate to mafic composition volcanic centers after cessation of active volcanism. May be related to Green et al. (1982) unit C - Intermediate to Mafic

Volcanics and Graywacke.

INTERMEDIATE TO MAFIC VOLCANIC UNITS

Zhabl **Andesitic to basaltic lavas (Neoproterozoic)**—Green, gray-green, gray, dark gray and black; typically unfoliated, amygdaloidal, plagioclase porphyritic, amphibole/pyroxene porphyritic and aphanitic; andesitic to basaltic lavas and shallow intrusions. Hyaloclastic texture is common and imparts a fragmental texture on some outcrops and float boulders. Conglomeratic rocks consisting of angular clasts of andesite and/or basalt occur locally and are interpreted as resedimented hyaloclastite.

Zhable **Andesitic to basaltic lavas with interlayered epiclastic rocks (Neoproterozoic)**—Light green, gray-green, gray, and dark gray; typically unfoliated, amygdaloidal, plagioclase porphyritic, amphibole/pyroxene porphyritic and aphanitic; metamorphosed: andesitic to basaltic lavas and shallow intrusions. Hyaloclastic texture is common and imparts a fragmental texture on some outcrops and float boulders. Contains lesser amounts of grayish-green, light green, and light gray to white; metamorphosed conglomerate, conglomeratic sandstone, sandstone, siltstone and mudstone.

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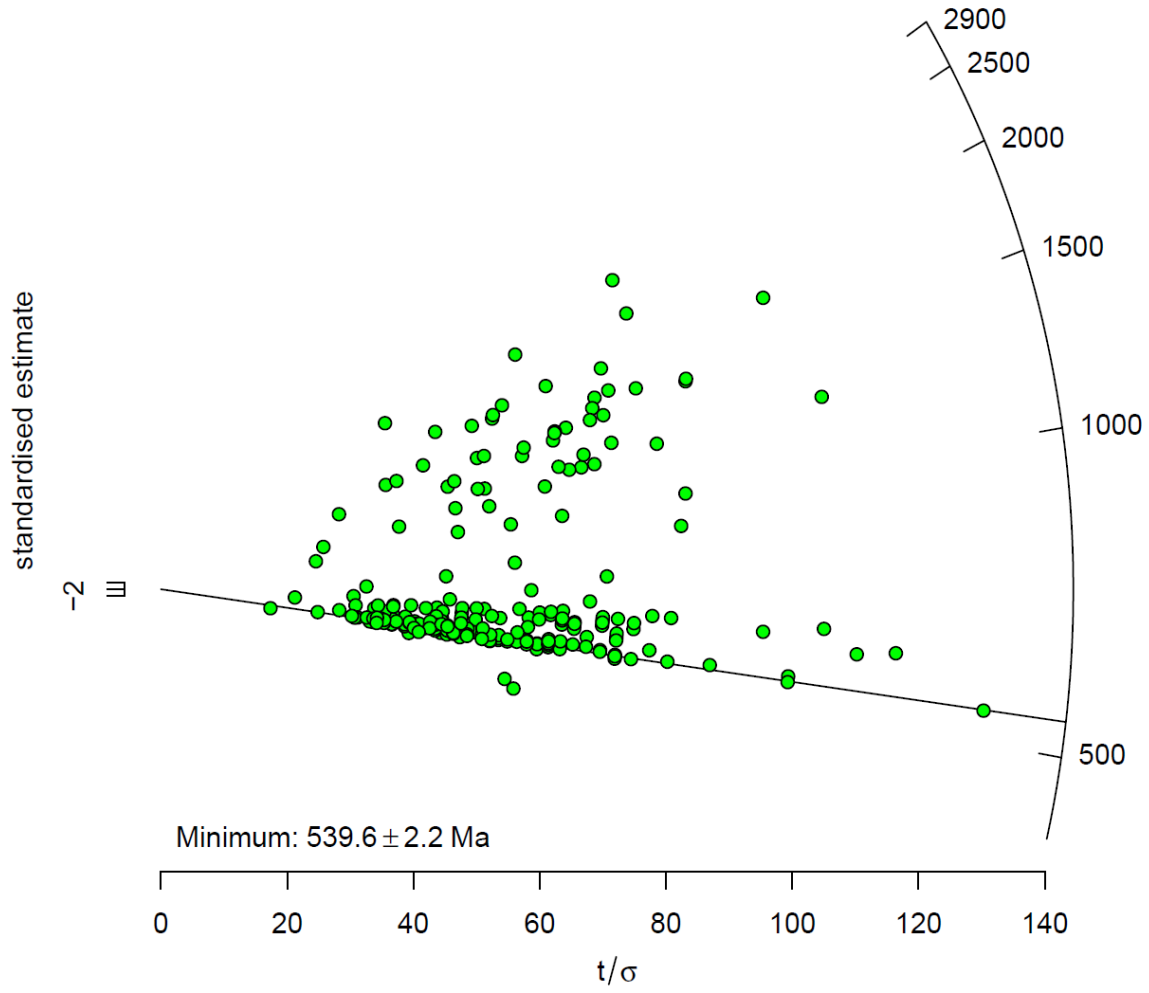
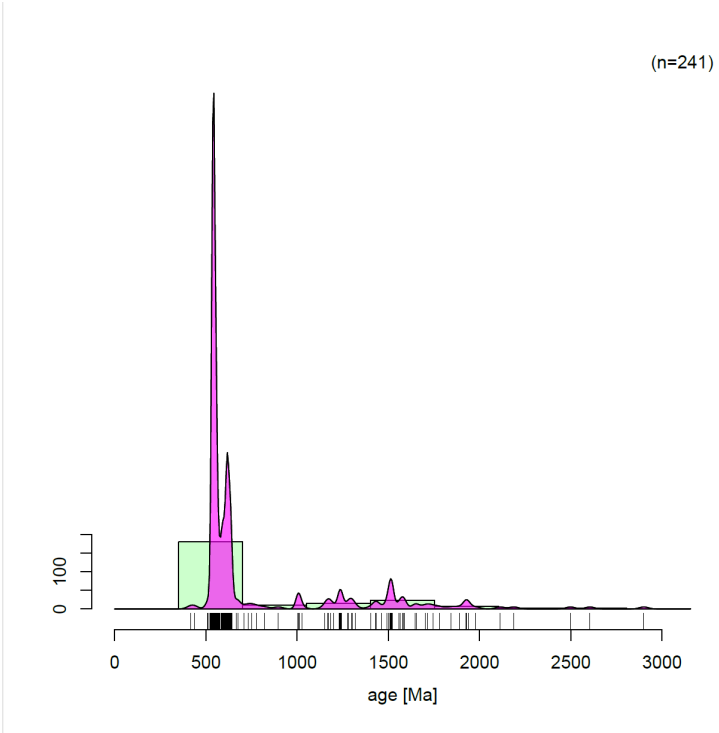
NCGS Station SP100K-551063
Rhyodacite (metamorphosed)
Crystallization age

Sample SP100K-551063 (n=19) has a weighted mean age of 550.4 ± 4.2 Ma, with an MSWD of 0.44. Sample SP100K-551063 has an outlying age of 572 ± 15 Ma.

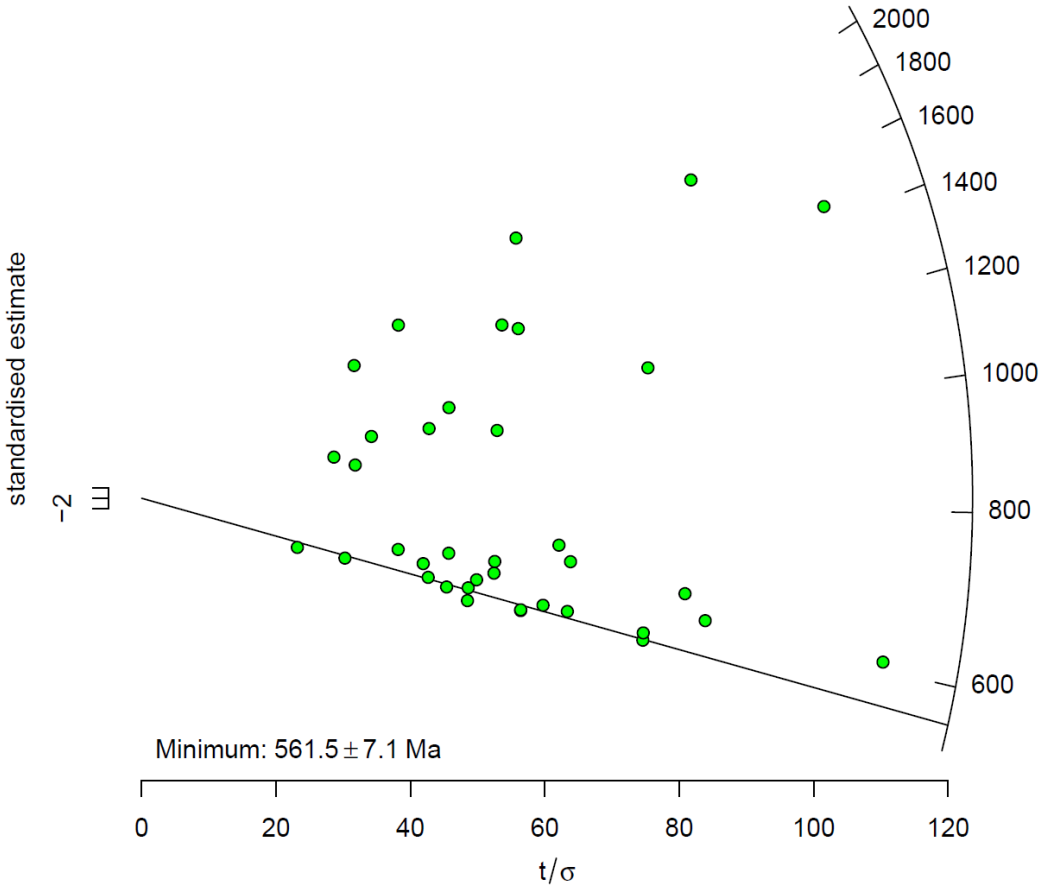
NCGS Station SP100K-551983
Laminated siltstone (metamorphosed)
Detrital age

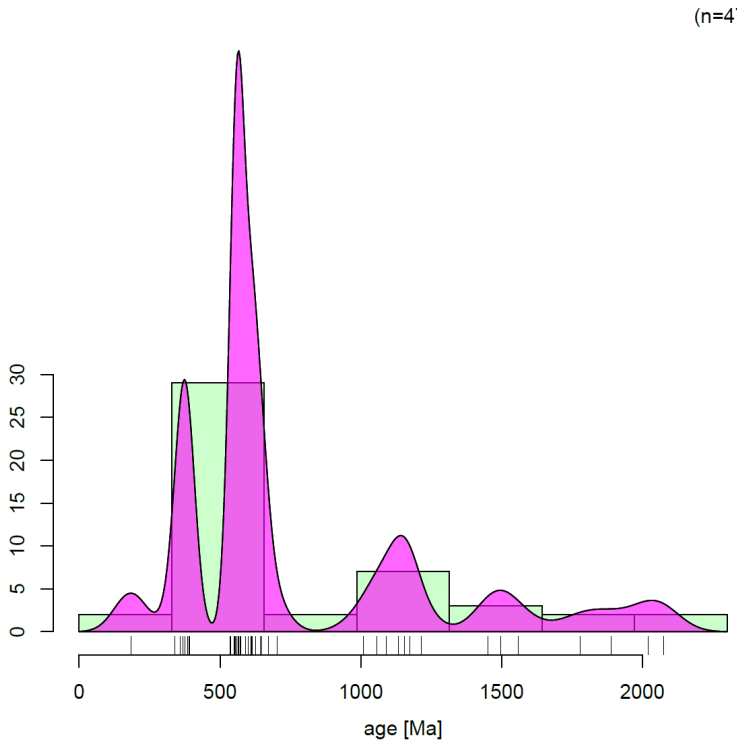




Using all concordant analyses, the MDA for sample SP100K-551983 is 539.6 ± 2.2 Ma (n=241).

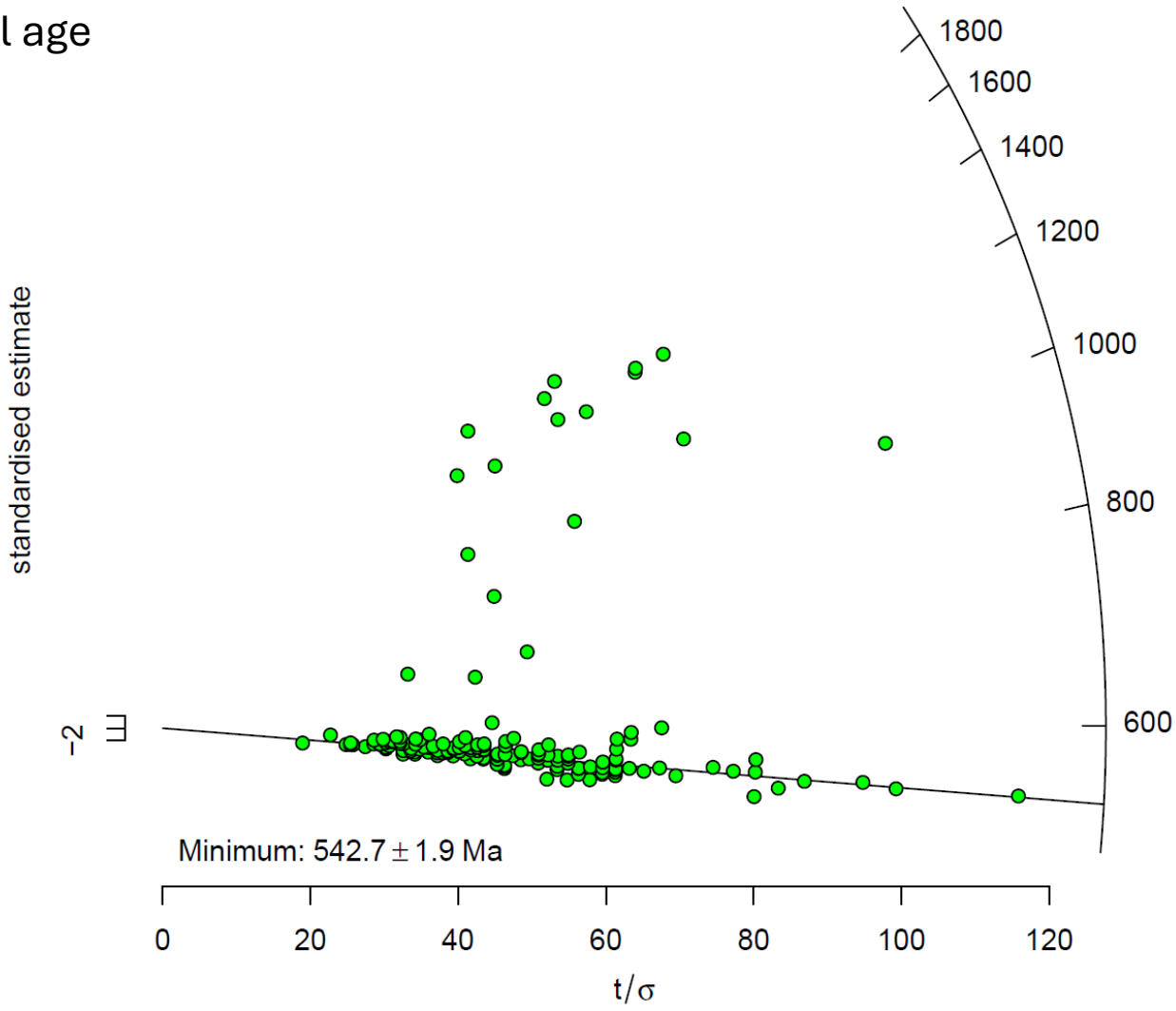
NCGS Station SP100K-551641
Siltstone (metamorphosed)
Detrital age

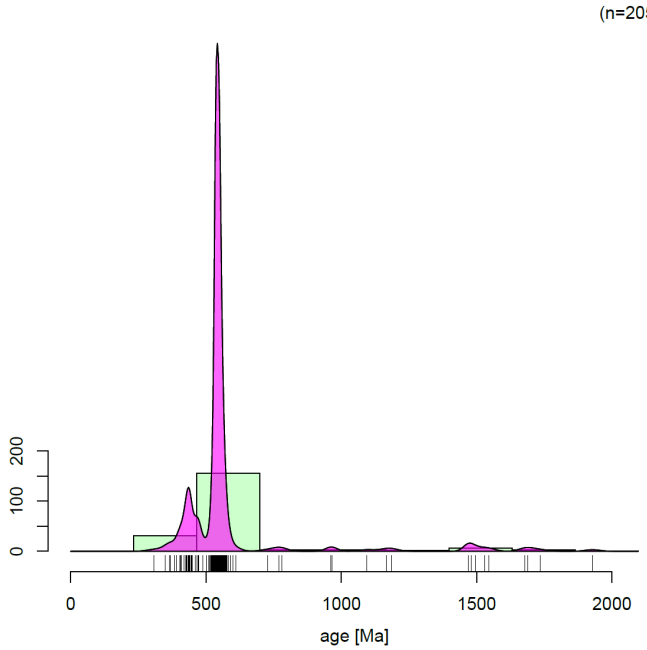




Using all concordant analyses older that 500 Ma, the MDA for sample SP100K-551641 is 561.5 ± 7.1 Ma. Multiple younger zircons were omitted from the MDA calculation. Using all concordant analyses, the MDA for sample SP100K-551641 is 339 ± 16 Ma (n=47). An MDA of ca. 339 Ma is interpreted as inaccurate and likely represents a metamorphic age. The sample location is proximal to the Lilesville granite - a ca. 330 Ma pluton.

NCGS Station SP100K-551786
Sandy siltstone (metamorphosed)
Detrital age





Using all concordant analyses older that 500 Ma, the MDA for sample SP100K-551786 is 542.7 ± 1.9 Ma. Multiple younger zircons were omitted from the MDA calculation. Using all concordant analyses, the MDA for sample SP100K-551786 is 326 ± 9.9 Ma (n=205). An MDA of ca. 326 Ma is interpreted as inaccurate and likely represents a metamorphic age. The sample location is proximal to the Lilesville granite - a ca. 330 Ma pluton.

Table 1. LA-ICP-MS U-Pb zircon data for the Southern Pines 100 K (crystallization ages)

	Composition		Isotopic Ratios									Ages (Ma)					
ID	U (ppm)	U/Th	$^{206}Pb/^{204}Pb$	$^{206}Pb/^{207}Pb$	Error (%)	$^{207}Pb/^{235}U$	Error (%)	$^{206}Pb/^{238}U$	Error (%)	error correlation	concordia distance (d_c)[a]	$^{206}Pb/^{238}U$	Error (Ma)	$^{207}Pb/^{235}U$	Error (Ma)	$^{206}Pb/^{207}Pb$	Error (Ma)
Southern Pines 100k																	
550264																	
1 B	448	1.14	44894	17.2676	2.4	0.72023	3.2	0.090239	2.1	0.658	-1	557	11.1	550.8	13.5	525.5	52.3
2	454	1.13	60113	17.5307	2.8	0.70727	4.6	0.089966	3.7	0.791	-1.8	555.3	19.5	543.1	19.5	492.2	62.5
3 B	96	1.69	16792	17.3069	4.5	0.71247	6.6	0.08947	4.8	0.731	-0.99	552.4	25.5	546.2	27.9	520.4	98.8
5 A	3001	0.45	6871915	16.8844	1.2	0.73145	2.9	0.089611	2.7	0.907	0.71	553.2	14.1	557.4	12.6	574.4	27
16 D	111	2.44	10977	17.4929	4.4	0.70401	6.2	0.089358	4.3	0.698	-1.7	551.7	22.8	541.2	25.9	496.9	97.3
6 A	454	1.19	1018356	16.8792	2.2	0.72337	4.3	0.088595	3.8	0.867	0.8	547.2	19.7	552.7	18.5	575.1	47
6 B	520	1.32	212769	17.0452	2.7	0.70316	3.6	0.086966	2.4	0.667	0.54	537.6	12.4	540.7	15.1	553.8	58.6
6 E	532	0.9	62733	17.2087	1.9	0.72573	2.9	0.090619	2.2	0.765	-0.8	559.2	11.8	554	12.3	532.9	40.7
15 B	261	2.02	26412	17.4325	3.2	0.70996	4.4	0.089803	3	0.693	-1.6	554.4	16.2	544.7	18.5	504.6	69.7
15 C	449	2.01	26194	17.3234	2.4	0.70109	3	0.088125	1.8	0.592	-0.88	544.4	9.2	539.4	12.5	518.3	52.9
15 D	432	2.17	60104	16.8945	2.8	0.71776	3.7	0.087987	2.4	0.657	1	543.6	12.6	549.3	15.6	573.1	60.3
14 E	823	1.41	112202	17.2829	2.2	0.72355	3.2	0.090736	2.3	0.734	-1.1	559.9	12.5	552.8	13.6	523.5	47.4
14 F	812	1.15	19792	16.9523	2.3	0.74862	3.4	0.092084	2.5	0.734	-0.065	567.9	13.6	567.4	14.8	565.7	50.4
13 E	109	1.26	14537	17.3673	4.3	0.74746	6.8	0.094192	5.3	0.775	-2	580.3	29.4	566.7	29.7	512.8	94.8
7 A	181	2.24	8277	17.4627	3.1	0.71723	4.6	0.090879	3.4	0.735	-1.8	560.7	18.2	549	19.6	500.7	68.8
7 B	1308	1.01	152313	16.8846	1.8	0.72184	2.9	0.088436	2.3	0.777	0.83	546.3	11.9	551.8	12.5	574.4	40.2
8 D	209	2.88	57456	17.3162	3.3	0.71387	4.2	0.089695	2.5	0.607	-1.2	553.7	13.5	547	17.7	519.3	73.1
8 A	411	2.19	86621	16.936	1.9	0.7115	3.9	0.087434	3.4	0.87	0.79	540.3	17.7	545.6	16.6	567.8	42.3
8 B	323	1.39	61058	17.2763	2.7	0.70464	3.9	0.088331	2.8	0.712	-0.67	545.7	14.6	541.6	16.4	524.3	60.1
12 B	867	0.77	488045	17.0969	2.3	0.72821	3.2	0.090338	2.2	0.68	-0.34	557.5	11.6	555.5	13.6	547.2	50.9
10 B	564	1.69	1286746	17.1749	3	0.71118	5.1	0.088627	4.1	0.808	-0.3	547.4	21.7	545.4	21.6	537.2	66.1
10 A	407	1.82	589720	17.0432	1.9	0.74566	3.4	0.092211	2.9	0.83	-0.41	568.6	15.6	565.7	15	554	42
12 A	897	0.73	239259	16.9237	1.9	0.72135	2.9	0.08858	2.3	0.774	0.67	547.1	11.9	551.5	12.5	569.4	40.4
12 D	719	0.86	74762	17.1815	2.2	0.71074	3.2	0.088607	2.3	0.736	-0.35	547.3	12.3	545.2	13.5	536.4	47.3
8 C	310	1.38	22655	17.1563	2.6	0.72132	4	0.089793	3.1	0.765	-0.44	554.3	16.4	551.4	17.1	539.6	56.8
13 B	295	1.25	174812	17.1984	2.5	0.75066	4	0.093676	3.1	0.782	-1.3	577.2	17.2	568.6	17.3	534.2	54.1
13 A	472	1.1	61888	17.1584	2.4	0.73705	3.9	0.091764	3.1	0.79	-0.77	566	16.5	560.7	16.6	539.4	51.8
14 D	413	1.57	145640	17.3853	2.3	0.7176	3.2	0.090523	2.1	0.679	-1.6	558.6	11.5	549.2	13.4	510.5	51
14 B*	521	1.85	37874	16.2042	3.6	0.8031	4.6	0.094426	2.9	0.617	2.8	581.7	15.9	598.6	21	663.2	78.2
14 A	440	1.72	18688	17.482	2.5	0.71095	3.9	0.090183	3	0.766	-1.7	556.6	16.1	545.3	16.6	498.3	55.7
15 A	400	2.3	419812	16.955	2.7	0.70894	4.4	0.087217	3.5	0.788	0.78	539.1	18	544.1	18.6	565.4	59.4
6 D	480	0.91	53177	17.2256	1.8	0.71525	3.4	0.089397	2.9	0.842	-0.6	552	15.1	547.9	14.4	530.8	40
551063																	
1 R	113	1.63	18347	17.3389	3.3	0.7062	5	0.088847	3.7	0.747	-1	548.7	19.6	542.5	21	516.4	73
3 R	69	1.88	19452	17.384	4.1	0.72339	6.3	0.091247	4.8	0.764	-1.6	562.9	25.9	552.7	26.8	510.7	89.2
3 C	149	1.17	6828	17.5172	6.3	0.68754	7.9	0.087389	4.7	0.598	-1.6	540.1	24.6	531.3	32.8	493.9	139.9
6 R	87	1.31	14491	17.187	3.3	0.71991	5.5	0.089779	4.4	0.797	-0.54	554.2	23.2	550.6	23.3	535.7	72.6
8*	114	2.15	24997	17.3059	4	0.73888	4.9	0.092782	2.7	0.565	-1.8	572	15	561.8	21	520.6	87.9
11 C	134	1.38	9723	17.4824	4.2	0.69571	5.4	0.088251	3.4	0.632	-1.5	545.2	17.8	536.2	22.5	498.3	92.1
13	244	1.23	24668	17.1319	2.7	0.72322	3.7	0.089902	2.5	0.671	-0.4	555	13.1	552.6	15.6	542.7	59.5
14	158	1.29	24304	17.4692	3.3	0.70396	4.6	0.089231	3.2	0.704	-1.6	551	17.1	541.2	19.3	500	71.9
16 R	266	1.2	13381	17.1193	3.1	0.71175	5.4	0.088412	4.3	0.812	-0.047	546.1	22.7	545.8	22.6	544.3	68.2
17	136	1.71	14890	16.9466	3.8	0.73443	5.3	0.090309	3.7	0.697	0.29	557.4	19.6	559.2	22.6	566.5	82.2
18 C	95	2.03	7970	17.4356	5.4	0.72274	6.7	0.091436	3.9	0.584	-2	564	21.1	552.3	28.5	504.2	119.4
18 R	228	2.35	22653	17.1076	3.1	0.71115	4.6	0.088276	3.3	0.73	0.017	545.3	17.5	545.4	19.3	545.8	68.5
20 C	121	1.7	6793	17.0323	5.5	0.72722	6.5	0.089874	3.5	0.533	0.025	554.8	18.4	554.9	27.7	555.5	119.6
20 R	81	2.07	39407	16.4472	4.7	0.74348	6.4	0.088727	4.3	0.669	2.8	548	22.5	564.4	27.7	631.2	102.3
23	101	1.3	52768	17.0676	4.2	0.70869	5.9	0.087765	4.1	0.703	0.28	542.3	21.4	544	24.7	550.9	91
24	205	1.59	28539	17.1556	2.5	0.71011	3.8	0.088395	2.9	0.754	-0.2	546	15	544.8	16	539.7	54.6
26	59	1.67	35517	17.0343	5	0.71147	6.2	0.087937	3.7	0.594	0.41	543.3	19.3	545.6	26.3	555.2	109.3
28	129	1.33	13453	17.3147	4.4	0.70725	6.6	0.088855	4.9	0.746	-0.9	548.8	26	543.1	27.9	519.4	96.8
29	181	1.29	26141	17.0586	3.1	0.71767	3.9	0.088831	2.4	0.601	0.12	548.6	12.4	549.3	16.6	552.1	68.4
30	112	1.52	13197	17.2086	4.2	0.72582	5.5	0.090629	3.6	0.649	-0.86	559.3	19.2	554.1	23.5	532.9	91.6
32	116	1.3	12468	17.0614	4.3	0.69618	5.6	0.086185	3.7	0.648	0.62	532.9	18.7	536.5	23.5	551.7	93.8
33	176	1.13	9355	17.2876	4.2	0.70318	5.1	0.088206	2.9	0.564	-0.75	544.9	15.1	540.7	21.4	522.9	92.5
34 C	432	0.85	51130	16.9898	2.7	0.71723	4.2	0.088418	3.2	0.759	0.45	546.2	16.8	549	17.9	560.9	59.9
34 R	135	1.48	49246	16.4048	3.5	0.75612	5.3	0.090003	3.9	0.738	2.6	555.6	20.6	571.8	23	636.8	76.4
37	121	1.17	13270	17.5481	3.7	0.69099	5.3	0.087982	3.8	0.714	-1.7	543.6	19.7	533.4	22	490	81.8
38 C	204	2.18	22022	17.2142	2.8	0.73311	4.1	0.091569	3	0.724	-1	564.8	16.1	558.4	17.6	532.3	62
40	186	1.11	24987	17.2966	2.6	0.70509	4.1	0.088491	3.1	0.772	-0.76	546.6	16.4	541.8	17	521.7	56.6
41	90	2.02	157068	16.9735	4.4	0.71573	6.6	0.088148	4.9	0.742	0.57	544.6	25.5	548.1	27.9	563	96.2
42	162	1.17	30633	17.3758	2.9	0.71339	5	0.089943	4	0.805	-1.3	555.2	21.3	546.8	21	511.7	64.7
43	124	2.17	7240	17.5039	6.2	0.70443	7.1	0.089468	3.5	0.495	-2	552.4	18.6	541.4	29.7	495.6	135.7
44	224	1.13	33780	17.078	2.6	0.71076	3.8	0.088076	2.8	0.735	0.17	544.1	14.5	545.2	15.9	549.6	55.9
6 C	200	1.44	11458	17.5633	4.1	0.69199	5	0.088186	2.8	0.565	-1.9	544.8	14.8	534	20.8	488.1	91.2
7 C	208	1.62	60351	17.0643	2.3	0.71647	4	0.088712	3.2	0.813	0.11	547.9	17	548.6	16.8	551.3	50.4
10 C	251	0.9	29627	17.2149	2.6	0.70721	4	0.088339	3	0.762	-0.42	545.7	15.8	543.1	16.7	532.2	56.2
48	139	1.07	33133	17.3112	3.5	0.71961	5	0.09039	3.6	0.716	-1.2	557.8	19.1	550.4	21.2	519.9	76.5
49	211	1.05	11900	17.3619	3.1	0.71617	4.6	0.090221	3.4	0.734	-1.3	556.8	18	548.4	19.5	513.5	68.6
50	163	1.31	32081	16.9852	2.8	0.72664	4.5	0.089553	3.5	0.787	0.26	552.9	18.6	554.6	19.1	561.5	60
550027																	
1	120	2.59	6277	17.0258	8.1	0.6775	9.5	0.083697	5	0.521	1.3	518.1	24.7	525.3	39.1	556.3	177.8
3	304	0.96	255501	17.2168	3.7	0.68053	5.1	0.085015	3.5	0.692	0.18	526	17.8	527.1	20.9	531.9	80.4
4	205	1.15	156219	17.1901	3.2	0.68889	4.3	0.085926	2.8	0.65	0.13	531.4	14.1	532.1	17.6	535.3	70.7
5	119	1.67	269850	16.7469	3.1	0.73106	4.7	0.088835	3.5	0.754	1.4	548.6	18.6	557.2	20.1	592.2	66.8
6	150	2.98	17373	17.6622	4.5	0.67427	6.1	0.086412	4	0.661	-1.9	534.3	20.5	523.3	24.8	475.7	100.6
7 R	158	2.06	15713	17.4038	4.6	0.68604	6.4	0.086634	4.5	0.698	-0.87	535.6	23.1	530.4	26.6	508.2	101.6
9	204	1.4	23622	17.373	3.5	0.70954	5.7	0.089443	4.5	0.788	-1.2	552.2	23.8	544.5	24	512.1	77.1
10	212	2.19	50760	17.5352	2.9	0.69422	4.7	0.088329	3.7	0.786	-1.6	545.6	19.2	535.3	19.5	491.6	63.8
11	279	1.35	42367	17.1117	2.5	0.69785	4.3	0.086646	3.4	0.806	0.29	535.7	17.6	537.5	17.8	545.3	55.1
12 R	229	1.31	10708	17.5417	3.2	0.68921	4.9	0.087724	3.6	0.745	-1.6	542.1	18.8	532.3	20.1	490.8	71.4
13	194	1.54	67328	17.0459	3.4	0.68756	4.4	0.085041	2.8	0.638	0.94	526.1	14.2	531.3	18.3	553.7	74.2
14 C	189	1.16	33074	17.4348	3.5	0.65973	5.4	0.083459	4.1	0.765	-0.39	516.7	20.5	514.4	21.8	504.3	76.7
14 R*	191	1.76	6882	17.6229	6.3	0.63927	6.9	0.081743	2.9	0.421	-0.92	506.5	14.1	501.9	27.3	480.6	138.4
16	143	1.85	12942	17.5342	5	0.69521	6.4	0.08845	4	0.629	-1.8	546.4	21.2	535.9	26.7	491.8	110.2
18	122	1.72	11793	17.5151	4.9	0.69813	7.2	0.088724	5.2	0.725	-1.7	548	27.3	537.7	29.9	494.1	109
20	239	2.26	65804	17.3285	2.3	0.70797	3.2	0.089016	2.3	0.702	-1	549.7	11.9	543.5	13.6	517.7	50.4
21	158	2.09	10180	17.4701	4.5	0.66994	6.1	0.084923	4.2	0.687	-0.83	525.4	21.3	520.7	25	499.8	98.3
22 R	184	1.64	21854	17.3874	3.5	0.70464	5.3	0.088899	4	0.75	-1.2	549	21	541.6	22.3	510.3	77.2
22 C	211	1.22	14928	17.4725	3.5	0.69815	4.7	0.088512	3.2	0.675	-1.5	546.7	16.7	537.7	19.7	499.5	76.6
24 C	485	0.82	75440	17.3036	2.3	0.68534	3.2	0.086047	2.3	0.705	-0.36	532.1	11.5	530	13.2	520.9	49.8
24 R	251	1.43	264591	17.4477	2.5	0.67129	3.5	0.084984	2.5	0.709	-0.73	525.8	12.6	521.5	14.4	502.7	54.9

Table 1. LA-ICP-MS U-Pb zircon data for the Southern Pines 100 K (crystallization ages)

	Composition		Isotopic Ratios									Ages (Ma)					
ID	U (ppm)	U/Th	$^{206}Pb/^{204}Pb$	$^{206}Pb/^{207}Pb$	Error (%)	$^{207}Pb/^{235}U$	Error (%)	$^{206}Pb/^{238}U$	Error (%)	error correlation	concordia distance (d_c)[a]	$^{206}Pb/^{238}U$	Error (Ma)	$^{207}Pb/^{235}U$	Error (Ma)	$^{206}Pb/^{207}Pb$	Error (Ma)
25	58	1.64	20477	16.7764	6.2	0.70336	8	0.085619	5	0.631	2	529.6	25.7	540.8	33.6	588.4	134.7
26	149	2.37	20567	17.5752	3.7	0.65252	5.2	0.083213	3.7	0.714	-0.91	515.3	18.5	510	21	486.6	81.2
27	152	3.14	37090	17.4951	3.5	0.69796	5.3	0.088601	4	0.754	-1.5	547.3	20.9	537.6	22.1	496.7	76.5
28*	485	1.37	1127079	17.0919	2.2	0.74746	3.7	0.092698	3	0.802	-0.68	571.5	16.1	566.7	16	547.8	48
29	220	1.48	28149	17.2024	3.4	0.71201	4.8	0.088872	3.4	0.707	-0.48	548.9	17.8	545.9	20.2	533.8	74.1
7 C	123	1.48	40803	17.1169	3.8	0.72433	5.4	0.089961	3.8	0.702	-0.34	555.3	20.1	553.2	22.9	544.6	83.6
31	76	1.71	56752	17.3321	5	0.70401	7.1	0.088537	5	0.714	-0.94	546.9	26.5	541.2	29.7	517.2	108.7
32	272	1.35	77384	17.2151	2.7	0.70479	3.8	0.088036	2.7	0.709	-0.38	543.9	14.1	541.6	15.9	532.1	58.6
33	316	1.63	66010	17.107	3	0.69032	3.8	0.085687	2.4	0.635	0.53	530	12.4	533	15.9	545.9	64.7
12 C	188	1.16	162653	17.1769	3.9	0.70189	6	0.087479	4.6	0.756	-0.11	540.6	23.6	539.9	25.2	537	86.4
35	214	1.51	106587	16.952	3.5	0.69381	5.7	0.085341	4.5	0.789	1.1	527.9	22.7	535.1	23.7	565.8	76.1
37	319	1.18	18115	17.3556	4	0.6893	4.8	0.086804	2.7	0.558	-0.76	536.6	13.9	532.4	20	514.3	88
38	204	1.67	58994	17.007	4.2	0.69894	6.4	0.086251	4.8	0.748	0.79	533.3	24.4	538.2	26.6	558.7	92.1
39	113	2.36	104950	17.3438	4.1	0.72549	5.7	0.0913	4	0.705	-1.5	563.2	21.7	553.9	24.4	515.8	89
40	89	1.91	7067	17.801	6.6	0.64462	7.7	0.083261	3.9	0.515	-2	515.6	19.5	505.2	30.5	458.3	145.6
41	254	1.78	49251	17.2972	3.7	0.68025	5	0.085377	3.4	0.668	-0.21	528.1	17	526.9	20.7	521.7	82.1
42	195	1.63	26180	17.5525	2.9	0.69041	4.2	0.087931	3	0.716	-1.7	543.3	15.7	533	17.5	489.5	65
43*	573	13.25	66476	16.8498	2.3	0.76324	5.2	0.093314	4.6	0.895	0.11	575.1	25.4	575.9	22.6	578.9	50
44 C	532	1.19	70375	17.2618	2.3	0.72022	4.4	0.090208	3.7	0.846	-0.87	556.8	19.8	550.8	18.7	526.2	51.4
44 R	441	1.28	31693	17.3674	2.9	0.72104	4.4	0.090863	3.3	0.751	-1.4	560.6	17.6	551.3	18.6	512.8	63.2

Notes:

[a]Concordia distance (d_c) was calculated using IsoplotR (Vermeesch, 2018), and we discarded analyses outside of the range $-2 < d_c < 4.6$ (Vermeesch, 2021).

*Analyses with an asterisk were considered outliers according to Chauvenet's Criterion in IsoplotR (Vermeesch, 2018). They were not included in the weighted mean.

Table 2. LA-ICP-MS U-Pb zircon data for the Southern Pines 100 K (detrital ages)

	Composition		Isotopic Ratios									Ages (Ma)					
ID	U (ppm)	Th/U	$^{206}Pb/^{204}Pb$	$^{206}Pb/^{207}Pb$	Error (%)	$^{207}Pb/^{235}U$	Error (%)	$^{206}Pb/^{238}U$	Error (%)	error correlation	concordia distance (d_c)[a]	$^{206}Pb/^{238}U$	Error (Ma)	$^{207}Pb/^{235}U$	Error (Ma)	$^{206}Pb/^{207}Pb$	Error (Ma)
Southern Pines 100k																	
Sample 551983																	
1	170	0.43	586561	10.3823	1.8	3.51978	3.9	0.265157	3.5	0.892	1.3	1516.2	46.7	1531.7	30.7	1553.1	32.9
2	40	0.32	18242	12.7737	5.1	2.15128	7.7	0.199393	5.8	0.751	-0.5	1172.1	62.2	1165.5	53.6	1153.2	101.3
3	79	0.50	26612	11.6707	3.3	2.60115	5.4	0.22027	4.3	0.795	1.2	1283.3	49.7	1301	39.4	1330.2	63.1
4	376	0.96	166729	17.1558	3	0.73002	6	0.090874	5.2	0.871	-0.6	560.7	28.1	556.6	25.8	539.7	64.7
5	343	0.31	238147	12.3697	2.1	2.3429	3.8	0.210284	3.2	0.834	-0.38	1230.3	35.8	1225.4	27.2	1216.7	41.6
6	120	0.57	199579	17.1206	5	0.69874	6	0.086802	3.4	0.564	0.26	536.6	17.4	538	25.1	544.2	108.3
11	176	0.93	34688	16.8935	3.6	0.70179	5	0.086025	3.5	0.697	1.3	532	17.7	539.9	20.8	573.3	77.7
12	267	0.20	111479	12.502	1.8	2.32514	3.8	0.210922	3.3	0.879	-1.3	1233.7	37.2	1220	26.7	1195.8	35.3
13	92	0.88	28406	16.7306	5.1	0.73435	7.3	0.089147	5.2	0.716	1.4	550.5	27.4	559.1	31.2	594.3	109.8
16	144	0.52	157949	10.796	2.3	3.10217	5.4	0.243009	4.9	0.903	2.8	1402.3	61.6	1433.2	41.5	1479.4	44
17	147	1.16	303295	16.7932	3.3	0.70824	6.6	0.0863	5.7	0.862	1.5	533.6	28.9	543.7	27.6	586.2	72.2
18	165	0.79	258172	8.8401	3.6	5.31268	5.7	0.340772	4.4	0.772	-1	1890.4	72.1	1870.9	48.7	1849.3	65.5
19	3033	0.60	103264	16.5531	2.7	0.73822	3.5	0.088666	2.1	0.61	2.4	547.6	11.1	561.4	14.9	617.4	59.3
21	242	0.91	123296	16.5853	4	0.71202	5.7	0.085686	4	0.71	2.8	530	20.4	545.9	23.9	613.2	86.1
22	186	0.67	26190	16.8651	3.8	0.71306	5.9	0.087258	4.5	0.764	1.2	539.3	23.2	546.6	24.8	576.9	82.3
23	123	0.65	31504	17.1908	3.4	0.69846	6.2	0.087123	5.2	0.836	-0.092	538.5	26.8	537.9	25.9	535.2	74.5
24	133	1.03	60842	16.9939	4.6	0.70928	9.5	0.087459	8.4	0.878	0.57	540.5	43.4	544.3	40.1	560.4	99.3
26	64	0.71	10737	17.2783	5.9	0.6604	13.1	0.082795	11.7	0.892	0.34	512.8	57.7	514.9	53	524.1	129.8
27	623	0.33	153575	16.3774	1.8	0.88189	3.3	0.104797	2.7	0.828	-0.061	642.5	16.6	642	15.6	640.4	39.5
28	249	0.53	276346	16.3614	3.1	0.83508	4.3	0.099139	3	0.7	1.1	609.4	17.5	616.4	19.8	642.5	65.8
29	169	0.90	33322	17.0955	4.7	0.69816	6.1	0.086603	3.8	0.631	0.41	535.4	19.7	537.7	25.4	547.4	103.2
30	24	0.45	28970	16.0426	9.1	0.88815	13.4	0.103384	9.9	0.738	1.5	634.2	59.9	645.4	64.1	684.7	193.3
31	111	0.58	72173	16.59	5.5	0.70712	6.6	0.08512	3.5	0.535	3.1	526.6	17.8	543	27.6	612.5	119.7
32	75	0.55	37952	9.2202	2.4	4.55806	6.9	0.304939	6.4	0.937	2.4	1715.8	97	1741.6	57.2	1772.8	43.7
33	376	0.95	699888	9.9182	1.4	4.0389	3.6	0.290662	3.3	0.921	-0.25	1644.8	47.5	1642.1	28.9	1638.5	25.7
34	48	0.84	10489	17.1024	8.3	0.69959	10.2	0.086816	6	0.587	0.33	536.7	30.9	538.5	42.7	546.5	180.8
35	191	0.88	70832	16.4251	3.3	0.86837	5.3	0.103492	4.1	0.786	-0.02	634.8	25	634.7	24.9	634.1	70.1
39	120	1.22	93573	16.3817	5.2	0.69249	7.4	0.082313	5.3	0.719	4.4	509.9	26.1	534.3	30.8	639.8	110.8
40	835	0.22	171288	15.1125	2.2	1.12861	3.8	0.123758	3	0.806	1.7	752.2	21.5	767.1	20.2	810.8	46.5
41	110	0.47	101257	16.757	4.2	0.74458	6.9	0.090532	5.5	0.795	0.96	558.7	29.3	565.1	29.8	590.9	90.6
43	561	0.19	197967	12.287	1.5	2.3833	3.2	0.21248	2.8	0.886	-0.42	1242	31.7	1237.6	22.6	1229.9	28.8
44	131	0.40	27587	16.0283	5.1	0.87985	7	0.102327	4.8	0.686	1.9	628	28.6	640.9	33.1	686.5	107.9
45	44	0.29	73444	9.4276	3.5	4.41426	7	0.301963	6.1	0.869	1	1701	91	1715	58	1732.1	63.7
46	242	0.51	65783	16.6949	2.8	0.78832	5.2	0.095495	4.4	0.846	0.31	588	24.6	590.2	23.1	598.9	59.6
47	94	0.71	142985	10.2596	2	3.68763	4.9	0.274519	4.5	0.914	0.45	1563.7	62.6	1568.7	39.4	1575.4	37.6
48	154	0.93	778376	17.0351	3.8	0.69899	6.6	0.0864	5.4	0.818	0.61	534.2	27.5	538.2	27.4	555.1	82.2
50	122	0.48	23903	16.0153	3.8	0.87278	6.3	0.101422	5	0.791	2	622.7	29.6	637.1	29.8	688.3	82
52	134	0.56	25734	16.8051	5.1	0.7452	6.7	0.090868	4.4	0.655	0.8	560.7	23.6	565.4	29.1	584.7	110.2
53	*114*	*0.68*	*50355*	*16.1176*	*6*	*0.93167*	*7.6*	*0.108958*	*4.6*	*0.61*	*0.27*	*666.7*	*29.3*	*668.5*	*37.2*	*674.6*	*128.6*
54	334	0.68	402385	16.6923	2.2	0.72606	3.4	0.087939	2.6	0.762	1.7	543.3	13.4	554.2	14.4	599.3	47.2
55	93	0.79	27722	17.1349	3.8	0.70611	7	0.087791	5.9	0.839	-0.003	542.5	30.7	542.4	29.5	542.3	83.7
56	185	0.88	196802	16.2387	4	0.83213	5.1	0.098048	3.3	0.637	1.9	603	18.9	614.8	23.7	658.6	85.1
57	551	0.64	550231	16.3775	1.9	0.84306	3.8	0.100185	3.3	0.869	0.71	615.5	19.5	620.8	17.8	640.4	40.8
58	135	0.95	73918	15.748	5	0.95186	8.6	0.108766	6.9	0.81	1.7	665.6	43.9	679.1	42.5	724	106.7
60	57	0.87	23872	17.0475	6.2	0.72359	8.8	0.089505	6.2	0.707	0.022	552.6	33	552.8	37.6	553.5	136.1
61	67	0.74	19786	16.722	6	0.70647	7.6	0.085719	4.7	0.622	2.2	530.2	24.1	542.7	32	595.4	129.2
62	263	0.38	253625	8.6012	1.8	5.30361	3.8	0.330998	3.3	0.875	1.8	1843.2	53.1	1869.4	32.4	1898.7	33
64	70	0.41	152989	16.5684	4.6	0.76957	8.8	0.092517	7.4	0.85	1.3	570.4	40.7	579.5	38.7	615.4	99.7
67	37	0.65	44411	16.2911	6.8	0.72786	9.2	0.086039	6.2	0.673	4.1	532.1	31.7	555.3	39.4	651.7	146.5
70	200	1.37	29589	16.492	3.5	0.84373	4.6	0.100965	3	0.647	0.17	620.1	17.7	621.2	21.5	625.3	76.2
71	156	0.55	53246	17.1299	3.8	0.70009	5	0.087017	3.4	0.668	0.16	537.9	17.4	538.8	21.1	543	82
72	108	0.68	58680	16.801	5	0.71096	7.4	0.086671	5.4	0.732	1.6	535.8	27.7	545.3	31.1	585.2	108.9
73	393	0.72	1262798	16.5786	2.5	0.78927	6.2	0.094944	5.7	0.915	1	584.7	31.6	590.8	27.7	614	53.9
74	197	1.37	49870	17.1258	3.8	0.71627	5.6	0.089006	4.2	0.738	-0.19	549.7	21.9	548.5	23.9	543.5	83.3
75	128	0.83	31740	16.8571	4.7	0.71297	6.7	0.087206	4.8	0.712	1.3	539	24.8	546.5	28.5	578	102.8
77	345	0.93	71598	16.4464	2.6	0.78305	4	0.093445	3.1	0.773	1.7	575.9	17.2	587.2	18	631.3	55.2
78	229	0.98	49102	16.0649	5.7	0.78807	7.5	0.091862	4.8	0.647	4	566.5	26.2	590.1	33.4	681.6	121.7
80	84	0.76	24828	16.4271	3.7	0.79664	6	0.094955	4.7	0.784	1.5	584.8	26.2	594.9	27	633.9	80
81	184	0.47	51768	16.5763	3.7	0.85167	5	0.102436	3.4	0.674	-0.46	628.7	20.1	625.6	23.3	614.3	79.5
82	227	1.20	148374	16.551	4.2	0.73871	5.2	0.088713	3	0.575	2.5	547.9	15.6	561.7	22.3	617.6	91.5
83	89	0.74	68206	16.3884	3.6	0.83968	6	0.099849	4.7	0.794	0.75	613.5	27.7	619	27.6	638.9	78
85	104	0.65	117062	16.7536	4.1	0.73338	6.5	0.089152	5.1	0.778	1.2	550.5	26.7	558.5	27.9	591.3	88.3
88	160	0.96	63106	16.9028	4.9	0.71552	7.3	0.087755	5.4	0.743	0.94	542.2	28	548	30.8	572.1	105.8
89	57	1.02	24153	16.9685	5.9	0.70372	8.2	0.086644	5.7	0.69	0.91	535.7	29.1	541	34.5	563.6	129.6
90	96	0.52	28210	16.1821	3	0.86792	6.5	0.101908	5.7	0.885	1.2	625.6	34.1	634.4	30.5	666.1	64.4
91	133	0.61	131607	8.2208	1.5	5.83279	4.6	0.347923	4.4	0.942	2.2	1924.7	72.6	1951.3	40.1	1979.6	27.6
92	531	0.16	291273	11.6975	1.8	2.67383	3.5	0.226945	3.1	0.863	0.23	1318.5	36.4	1321.3	26.2	1325.8	34.7
93	224	0.61	89619	17.1928	2.5	0.69498	5	0.086699	4.3	0.863	-0.03	536	22.3	535.8	21	535	55.6
94	758	0.09	690828	10.4578	1.9	3.47701	3.3	0.263839	2.7	0.815	0.82	1509.5	36.5	1522	26.2	1539.5	36.2
96	340	0.24	2760550	9.1499	1.4	4.79428	2.8	0.318298	2.4	0.864	0.17	1781.4	37.7	1783.9	23.5	1786.8	25.7
98	86	0.80	24165	16.6575	5.3	0.74173	8.2	0.08965	6.2	0.765	1.6	553.5	33.1	563.4	35.3	603.8	113.8
99	73	0.82	25674	15.316	5.4	1.0803	8.4	0.120056	6.5	0.767	1.5	730.9	44.6	743.8	44.4	782.8	113.6
100	162	0.64	16768	17.0988	4.2	0.70787	5.9	0.087825	4.1	0.695	0.13	542.7	21.2	543.5	24.6	546.9	92
101	80	0.45	30127	17.1738	5.4	0.69805	7.3	0.086985	5	0.676	-0.013	537.7	25.6	537.6	30.6	537.4	118.3
102	268	1.05	120082	16.741	3.7	0.72254	5.1	0.087768	3.5	0.686	1.7	542.3	18.2	552.2	21.7	593	80.3
103	357	0.43	156465	16.4374	3.5	0.85572	4.6	0.10206	3	0.652	0.2	626.5	17.8	627.8	21.4	632.5	74.7
105	404	0.86	61931	17.1039	3.1	0.71538	3.9	0.088782	2.4	0.606	-0.066	548.3	12.6	547.9	16.7	546.3	68.5
106	*263*	*0.93*	*54541*	*17.061*	*2.7*	*0.71509*	*4.5*	*0.088523*	*3.6*	*0.803*	*0.15*	*546.8*	*19.1*	*547.8*	*19.2*	*551.8*	*59.2*
107	337	1.09	34612	16.9488	2.5	0.70787	3.2	0.087053	2.1	0.635	0.94	538.1	10.6	543.5	13.6	566.2	54.4
108	70	1.19	11612	17.2909	5.3	0.68013	7	0.085331	4.6	0.649	-0.18	527.9	23.1	526.9	28.9	522.5	117.2
109	99	0.28	43916	12.951	2.3	2.07777	4.8	0.195251	4.2	0.875	-0.79	1149.8	44.3	1141.5	32.9	1125.9	46.2
110	196	0.41	31098	16.7991	5	0.71491	5.8	0.087142	2.9	0.498	1.7	538.6	14.9	547.7	24.4	585.5	108.6
111	159	0.63	46027	16.696	4	0.72419	5.9	0.087732	4.4	0.738	1.8	542.1	22.8	553.1	25.3	598.8	86.7
112	39	0.36	30729	13.4438	5.1	1.72514	10.2	0.168283	8.8	0.863	1.5	1002.6	81.3	1017.9	65.3	1051	103.6
114	131	0.76	408030	16.0692	2.9	0.84617	4.9	0.098661	3.9	0.807	2.2	606.6	22.7	622.5	22.7	681.1	61.5
117	77	0.65	15434	17.2394	5.4	0.71422	7.6	0.089341	5.3	0.703	-0.72	551.6	28.2	547.3	32.1	529	118.1
118	62	1.05	10872	16.7382	6	0.71335	8.4	0.086637	5.9	0.697	1.9	535.6	30.2	546.7	35.6	593.4	130.7
120	172	1.02	16116	16.2429	3.2	0.87402	4.4	0.10301	3	0.681	0.84	632	18.1	637.7	20.9	658.1	69.4
121	177	0.23	173204	10.7399	2.4	3.26597	4.3	0.25451	3.6	0.83	0.78	1461.7	46.9	1473	33.6	1489.3	45.6
122	94	0.55	249073	16.5018	4.3	0.73818	6.6	0.088387	5	0.756	2.5	546	25.9	561.3	28.3	624.1	92.6
123	135	0.59	20746	17.268	3.6	0.69171	5.3	0.086669	3.9	0.736	-0.33	535.8	20.1	533.8	22	525.4	78.7
124	238	0.46	71077	16.7238	3.3	0.7105	4.4	0.086218	2.9	0.662	2.1	533.1	14.8	545	18.4	595.2	71
125	182	1.00	128832	16.9009	3	0.73045	5.9	0.089577	5.1	0.864	0.55	553	27.1	556.8	25.3	572.3	64.6
126	149	0.48	134327	16.0292	3.7	0.8642	4.8	0.100513	3	0.636	2.4	617.4	17.8	632.4	22.4	686.4	78.5
127	147	0.58	60385	10.6707	2	3.21508	4.4	0.24893	3.9	0.891	2.4	1433	49.8	1460.8	33.7	1501.5	37.4
128	223	0.98	54948	16.5381	2.9	0.83538	4.7	0.100245	3.6	0.78	0.1	615.8	21.4	616.6	21.5	619.3	62.9
129	246	0.22	177513	8.3372	1.5	5.79279	4.1	0.35043	3.8	0.931	0.69	1936.6	63.2	1945.3	35.1	1954.6	26.5
130	80	0.70	15566	16.8449	4.1	0.76532	6.8	0.093542	5.4	0.799	0.092	576.4	29.9	577.1	29.9	579.6	88.7
132	178	0.68	13046	17.1049	3.2	0.70421	4.8	0.087402	3.5	0.743	0.19	540.2	18.3	541.3	19.9	546.1	69.6
133	551	0.26	239420	14.3276	2.2	1.43595	3.4	0.149282	2.6	0.768	0.69	896.9	21.9	904	20.3	921.4	44.7
134	211	1.61	168774	16.433	2.3	0.84036	5	0.100202	4.4	0.889	0.52	615.6	26.1	619.3	23.2	633.1	49.2

Table 2. LA-ICP-MS U-Pb zircon data for the Southern Pines 100 K (detrital ages)

	Composition		Isotopic Ratios									Ages (Ma)					
ID	U (ppm)	Th/U	$^{206}Pb/^{204}Pb$	$^{206}Pb/^{207}Pb$	Error (%)	$^{207}Pb/^{235}U$	Error (%)	$^{206}Pb/^{238}U$	Error (%)	error correlation	concordia distance (d_c)[a]	$^{206}Pb/^{238}U$	Error (Ma)	$^{207}Pb/^{235}U$	Error (Ma)	$^{206}Pb/^{207}Pb$	Error (Ma)
136	92	0.23	605367	11.6132	3.5	2.64527	5.6	0.222903	4.4	0.781	1.1	1297.2	51.4	1313.3	41.3	1339.7	67.7
137	41	0.74	236148	16.4229	5.5	0.83148	8.8	0.099082	6.8	0.782	0.76	609	39.8	614.4	40.4	634.4	117.4
138	176	1.01	154125	16.0101	3.3	0.8918	5.3	0.103599	4.2	0.791	1.6	635.5	25.4	647.3	25.4	688.9	69.3
139	139	0.43	18331	16.4116	4.9	0.7991	6.1	0.095158	3.6	0.591	1.7	586	20.1	596.3	27.4	635.9	105.6
140	173	1.19	72013	17.2744	4.5	0.69431	6	0.087027	4	0.665	-0.44	537.9	20.7	535.4	25.1	524.6	98.9
142	283	0.32	471811	15.9912	2.5	0.89992	3.6	0.104419	2.6	0.719	1.6	640.3	15.7	651.7	17.2	691.5	53
143	190	0.28	38774	16.482	3.5	0.79071	4.6	0.094563	2.9	0.643	1.5	582.5	16.4	591.6	20.5	626.6	75.5
144	200	0.56	490498	6.2053	2	10.51143	4.7	0.47328	4.3	0.904	-0.96	2497.9	88.4	2480.9	43.8	2467	34
145	434	0.16	403891	12.0045	3.2	2.4273	3.9	0.211427	2.1	0.547	1.3	1236.4	23.8	1250.7	27.8	1275.4	63.1
146	269	0.83	29956	17.3132	3.4	0.68951	4.9	0.086619	3.6	0.734	-0.49	535.5	18.6	532.5	20.5	519.6	73.7
147	247	1.02	106864	16.6066	3.1	0.80109	5.2	0.096529	4.2	0.809	0.47	594	24.1	597.4	23.7	610.4	66.7
148	333	0.49	1877577	16.3046	2.9	0.86773	4.1	0.102657	2.9	0.702	0.63	630	17.4	634.3	19.5	650	63.1
149	77	1.37	244136	16.9628	5.5	0.72149	8.3	0.088802	6.2	0.744	0.5	548.4	32.5	551.5	35.3	564.3	120.8
150	85	0.62	17548	16.565	6.2	0.72761	7.4	0.087455	4.1	0.549	2.7	540.5	21.2	555.2	31.8	615.8	134.3
151	48	0.64	132928	16.6906	6	0.71057	8.7	0.086054	6.3	0.721	2.2	532.2	32	545.1	36.6	599.5	130.4
152	*140*	*0.85*	*46850*	*16.7072*	*4.6*	*0.72452*	*8.1*	*0.087831*	*6.7*	*0.822*	*1.6*	*542.7*	*34.8*	*553.3*	*34.7*	*597.3*	*100.5*
153	124	0.54	246819	15.6725	3.9	1.02199	5.4	0.11622	3.6	0.677	0.83	708.8	24.3	714.9	27.5	734.3	83.4
154	202	0.23	92368	13.701	2.4	1.69984	3.6	0.168988	2.6	0.741	0.17	1006.5	24.7	1008.5	22.8	1012.7	48.5
156	175	0.69	76933	16.9446	3.8	0.736	5.7	0.090491	4.3	0.751	0.25	558.4	23.1	560.1	24.8	566.7	82.6
157	130	0.98	33645	16.7419	5	0.72157	6.3	0.087655	3.9	0.613	1.7	541.7	20.2	551.6	27	592.9	108.7
158	109	0.51	110178	9.8829	2.3	3.80772	4.9	0.273052	4.4	0.89	3.1	1556.3	60.8	1594.4	39.7	1645.1	41.8
160	368	0.12	638714	11.6564	2.1	2.64657	4	0.223843	3.3	0.842	0.86	1302.1	39.2	1313.7	29.1	1332.6	41.2
161	63	0.73	38103	16.7188	5.5	0.72037	8.7	0.087389	6.8	0.778	1.7	540.1	35	550.9	36.9	595.8	118.3
162	125	1.19	15230	15.9602	3.8	0.8589	5.5	0.099466	4	0.726	2.7	611.3	23.4	629.5	25.9	695.6	81
163	117	0.67	83832	16.812	5.3	0.72112	6.3	0.087967	3.4	0.541	1.4	543.5	17.9	551.3	27	583.8	115.8
164	64	0.81	71854	16.6341	4.2	0.7224	6	0.08719	4.3	0.718	2.2	538.9	22.3	552.1	25.6	606.8	90.6
165	75	0.78	116417	16.5888	4.6	0.81303	7.7	0.097862	6.2	0.803	0.32	601.9	35.7	604.2	35.2	612.7	99.4
166	116	0.62	117464	16.7777	3.9	0.73277	6	0.089206	4.6	0.76	1.1	550.8	24.3	558.2	25.9	588.2	85.1
167	1112	0.96	227360	16.3961	1.7	0.82578	2.5	0.098242	1.8	0.71	1.1	604.1	10.1	611.3	11.3	637.9	37.4
168	209	0.81	51240	16.5155	2.9	0.83846	4.4	0.100478	3.3	0.757	0.15	617.2	19.5	618.3	20.3	622.3	61.7
169	138	0.76	48912	17.0042	4.5	0.70496	5.3	0.086979	2.8	0.534	0.75	537.6	14.6	541.7	22.2	559.1	97.5
170	199	0.88	72471	17.1336	3.9	0.7135	5.4	0.088703	3.7	0.697	-0.17	547.9	19.7	546.8	22.7	542.5	84.2
171	147	0.72	55638	16.892	3.8	0.6969	5.5	0.085418	4	0.722	1.4	528.4	20.1	536.9	22.9	573.5	82.7
172	197	0.77	89507	16.4426	3.9	0.75817	5.1	0.090454	3.4	0.661	2.5	558.2	18.2	573	22.5	631.8	83
174	86	0.63	10955	16.7838	5.9	0.71144	7.6	0.086641	4.8	0.629	1.8	535.6	24.6	545.6	32.1	587.4	128.3
175	211	0.72	67644	16.0127	4	0.83681	5.1	0.097227	3.2	0.627	3.1	598.1	18.4	617.4	23.8	688.6	85.4
176	154	0.96	28446	17.1183	4.3	0.71521	6	0.088836	4.1	0.692	-0.14	548.6	21.7	547.8	25.2	544.5	93.9
178	461	0.30	170418	10.4922	1.5	3.49703	3.9	0.266231	3.6	0.924	0.47	1521.6	49.1	1526.5	31	1533.3	28.3
180	147	0.35	59900	17.0067	4.3	0.75548	6.4	0.093226	4.7	0.735	-0.49	574.6	25.8	571.4	27.9	558.8	94.3
182	74	0.92	61646	16.6297	6.4	0.72847	8	0.0879	4.8	0.598	2.2	543.1	25.1	555.7	34.4	607.4	139.4
183	227	0.68	99220	17.0792	3	0.70337	4.7	0.087166	3.7	0.78	0.32	538.8	19.1	540.8	19.9	549.5	64.9
184	126	0.70	23617	17.0188	3.5	0.77811	5.9	0.096087	4.8	0.813	-0.98	591.4	27.3	584.4	26.4	557.2	75.5
185	75	0.72	69945	15.8187	5.3	0.896	7.4	0.102842	5.3	0.709	2.7	631	31.7	649.6	35.7	714.6	111.6
186	369	0.72	258134	16.7353	1.9	0.79307	3.4	0.096302	2.9	0.832	0.03	592.7	16.1	592.9	15.4	593.7	41.2
187	113	0.73	35106	16.8082	4	0.69686	5.9	0.084989	4.4	0.739	1.9	525.8	22.2	536.9	24.8	584.3	87
188	203	1.02	88697	16.6054	3.2	0.75139	6.6	0.090534	5.7	0.875	1.5	558.7	30.7	569	28.6	610.5	68.7
189	192	0.48	229304	9.7877	2	4.11503	3.8	0.292246	3.2	0.843	0.3	1652.7	46.2	1657.3	30.7	1663	37.4
190	57	0.81	15634	16.7929	5.3	0.73736	7.5	0.089846	5.3	0.708	1	554.6	28.2	560.9	32.2	586.2	114.7
191	424	0.45	166174	16.4645	2	0.86812	2.9	0.103711	2	0.707	-0.23	636.1	12.3	634.5	13.6	628.9	43.8
194	95	0.56	12888	17.2012	4.8	0.71313	7.4	0.089007	5.6	0.765	-0.49	549.7	29.7	546.6	31.2	533.9	104.1
195	66	0.58	166758	9.3055	2.6	4.6023	6.1	0.310748	5.5	0.9	0.41	1744.4	83.5	1749.7	50.6	1756	48.3
197	171	0.60	210790	17.036	3.7	0.73722	4.6	0.09113	2.7	0.593	-0.25	562.2	14.7	560.8	19.9	555	81.2
198	213	0.88	199749	16.5447	3.4	0.86089	4.9	0.103348	3.5	0.721	-0.48	634	21.4	630.6	23.1	618.5	73.5
199	427	0.88	1743713	16.9361	2.8	0.72671	4.2	0.089303	3.1	0.741	0.52	551.4	16.4	554.6	17.9	567.8	61.4
200	403	0.31	3938376	13.7254	1.8	1.69812	3.9	0.169117	3.4	0.887	0.059	1007.2	31.9	1007.8	24.6	1009.1	36
202	272	1.12	52630	16.6025	2.7	0.82753	4.2	0.099691	3.2	0.771	-0.05	612.6	18.8	612.2	19.2	610.9	57.5
203	34	0.60	16049	17.4132	8.2	0.70021	10.7	0.08847	6.9	0.646	-1.3	546.5	36.2	538.9	44.8	507	179.9
205	80	1.12	10725	4.6249	5.4	16.92998	8.8	0.568134	7	0.793	1.2	2900.2	163.4	2930.9	84.6	2952	86.6
207	123	0.89	602942	16.6627	4.3	0.71304	6.8	0.08621	5.2	0.772	2.2	533.1	26.7	546.6	28.6	603.1	93
208	94	0.97	22978	16.8624	5.6	0.74264	7.3	0.090864	4.6	0.637	0.57	560.6	24.9	563.9	31.5	577.3	122
209	167	0.66	27860	17.061	4.8	0.71032	6	0.087933	3.6	0.601	0.29	543.3	18.7	544.9	25.2	551.8	104.1
211	88	0.40	205386	16.3392	5.6	0.80933	8.2	0.095951	5.9	0.724	1.8	590.6	33.4	602.1	37.1	645.4	121.1
212	117	0.75	20342	17.2022	4.1	0.71035	6.3	0.088664	4.9	0.765	-0.41	547.6	25.5	545	26.7	533.8	89.4
213	102	0.41	30158	16.7134	4.4	0.74561	6.5	0.090421	4.8	0.739	1.2	558	25.6	565.7	28.1	596.5	94.6
214	196	0.83	26871	16.0375	2.7	0.94853	4.1	0.110377	3.1	0.758	0.31	674.9	19.9	677.3	20.3	685.3	57.1
215	491	0.61	259933	16.522	1.9	0.83554	3.8	0.100167	3.3	0.873	0.17	615.4	19.4	616.7	17.5	621.4	40
216	254	0.76	73892	16.9861	3.4	0.75784	4.5	0.093403	2.9	0.651	-0.47	575.6	16.2	572.8	19.8	561.4	74.7
218	138	0.25	150584	12.4119	2.2	2.2714	5.2	0.204563	4.7	0.903	0.38	1199.8	50.9	1203.4	36.3	1210	43.6
219	56	0.61	156798	14.9285	4.7	1.18163	6.7	0.127994	4.7	0.707	1.9	776.4	34.6	792.1	36.8	836.4	98.7
220	146	1.45	94829	16.6825	4.1	0.72531	6.2	0.087797	4.6	0.749	1.9	542.5	24.1	553.8	26.4	600.5	88.6
221	168	0.60	2681750	10.0512	1.5	3.80119	3.6	0.277224	3.3	0.906	1.4	1577.4	45.7	1593	29	1613.7	28.5
222	157	0.34	123753	14.7191	2.9	1.27202	4.7	0.135853	3.8	0.794	1.2	821.2	29.1	833.3	27	865.8	59.8
223	212	0.31	94409	7.9263	1.7	6.24611	4.7	0.359233	4.3	0.927	2.5	1978.5	73.5	2010.9	40.7	2044.3	30.7
224	115	0.48	32975	16.5617	4.4	0.8714	5.7	0.104717	3.7	0.64	-0.84	642	22.3	636.3	27	616.2	94.7
225	371	0.41	1523660	16.3407	2.5	0.88528	4.1	0.104965	3.3	0.797	0.047	643.4	20	643.8	19.5	645.2	53.2
226	332	0.21	192112	12.3869	2.2	2.36029	4.1	0.212139	3.4	0.837	-0.75	1240.2	38.3	1230.7	29	1214	43.7
227	284	0.55	106132	16.5202	2.3	0.80915	3	0.096993	1.9	0.641	0.84	596.8	11	602	13.7	621.7	49.8
228	95	0.59	26350	13.3951	3.9	1.77526	6	0.172545	4.6	0.762	0.88	1026.1	43.4	1036.4	39	1058.3	78.3
230	61	0.90	155900	16.6177	6.6	0.7376	9.2	0.088938	6.4	0.693	2	549.3	33.6	561	39.7	608.9	143.6
231	64	0.48	234092	10.3945	2.7	3.5231	4.5	0.265718	3.6	0.808	0.85	1519	49.4	1532.4	35.7	1550.9	49.9
232	113	1.20	29075	16.184	4.2	0.85733	7.1	0.100676	5.7	0.806	1.4	618.4	33.8	628.7	33.3	665.9	90.2
233	31	0.29	92909	12.283	4.9	2.22577	9.8	0.198372	8.5	0.863	1.9	1166.6	90.3	1189.2	68.7	1230.6	97.1
236	483	0.46	161915	10.4856	1.4	3.49995	3	0.266286	2.7	0.888	0.44	1521.9	35.9	1527.2	23.6	1534.5	25.9
237	192	0.36	136086	12.5357	2.2	2.21337	4.2	0.201326	3.6	0.848	0.24	1182.4	38.4	1185.3	29.3	1190.5	43.9
238	378	0.85	98967	16.5235	2.3	0.80567	4	0.096595	3.2	0.81	0.78	594.4	18.3	600	18	621.2	50.4
239	129	0.88	22883	16.9505	4.2	0.70495	5.4	0.086703	3.3	0.611	1	536	16.8	541.7	22.5	566	92.3
240	176	0.79	119795	17.2284	3.1	0.72118	4.5	0.090154	3.3	0.728	-0.8	556.4	17.4	551.4	19.1	530.4	67.4
241	236	1.14	86058	17.3327	2.8	0.71166	4.3	0.089502	3.2	0.756	-1.1	552.6	17.1	545.7	18	517.2	61.2
243	56	0.34	47395	10.2129	2.1	3.75499	8.2	0.27826	8	0.968	0.068	1582.6	112	1583.2	66.1	1583.9	38.6
245	68	0.92	42687	16.8645	6.6	0.72563	9	0.088794	6.2	0.686	0.94	548.4	32.5	554	38.4	577	142.4
248	99	0.77	25930	16.2515	6.7	0.76149	9	0.089795	6	0.663	3.5	554.3	31.6	574.9	39.4	657	144.2
249	89	0.93	13368	17.2794	5	0.73328	7	0.091938	4.9	0.701	-1.4	567	26.6	558.5	30.1	523.9	109.5
251	*130*	*0.89*	*16241*	*17.0099*	*4.7*	*0.7224*	*6.1*	*0.089161*	*3.9*	*0.638*	*0.26*	*550.6*	*20.6*	*552.1*	*26.1*	*558.3*	*102.9*
252	107	0.50	181012	8.2082	2.1	5.85276	5.1	0.34858	4.7	0.916	2	1927.8	78.1	1954.3	44.4	1982.4	36.6
253	252	0.66	30064	16.8981	2.8	0.71815	4.1	0.088054	3	0.724	0.91	544	15.5	549.6	17.5	572.7	61.7
254	132	1.27	48720	16.9011	4.3	0.72208	5.4	0.088552	3.4	0.617	0.85	547	17.6	551.9	23.2	572.3	93.2
255	78	0.80	42441	16.6186	5.6	0.835	8.2	0.100687	6.1	0.739	-0.29	618.4	35.9	616.4	38.1	608.8	120.1
256	207	1.35	54337	17.0031	3.2	0.71067	4.3	0.087678	2.9	0.668	0.57	541.8	15.1	545.1	18.3	559.2	70.5
257	343	0.31	69420	16.7643	2.4	0.81205	3.7	0.098779	2.8	0.765	-0.52	607.2	16.2	603.6	16.7	589.9	51.1
258	139	0.40	37376	13.9975	2.4	1.67355	4.6	0.169975	3.9	0.85	-1.2	1012	36.4	998.5	29.1	969.1	49.1
259	137	1.09	26043	17.3568	5.2	0.68041	6.6	0.085691	4	0.608	-0.54	530	20.4	527	27.2	514.1	115.3
261	42	0.95	98564	16.942	7.5	0.72317	9.5	0.0889	5.9	0.617	0.61	549	30.8	552.5	40.5	567.1	162.8
262	229	0.81	113771	16.3433	3	0.87792	4.5	0.104109	3.4	0.743	0.19	638.4	20.5	639.9	21.6	644.9	65.3

Table 2. LA-ICP-MS U-Pb zircon data for the Southern Pines 100 K (detrital ages)

	Composition		Isotopic Ratios									Ages (Ma)					
ID	U (ppm)	Th/U	$^{206}Pb/^{204}Pb$	$^{206}Pb/^{207}Pb$	Error (%)	$^{207}Pb/^{235}U$	Error (%)	$^{206}Pb/^{238}U$	Error (%)	error correlation	concordia distance (d_c)[a]	$^{206}Pb/^{238}U$	Error (Ma)	$^{207}Pb/^{235}U$	Error (Ma)	$^{206}Pb/^{207}Pb$	Error (Ma)
146	267	0.83	86327	17.222	2.5	0.68861	3.6	0.08605	2.6	0.714	-0.029	532.1	13.3	532	15.1	531.3	55.9
148	232	0.60	18938	17.3585	3.7	0.68794	4.6	0.086648	2.7	0.579	-0.75	535.7	13.6	531.6	18.9	513.9	82
149	161	0.74	21873	17.3622	3.3	0.67142	4.3	0.084585	2.7	0.625	-0.34	523.4	13.4	521.6	17.5	513.4	73.4
151	385	0.70	45832	17.1566	2.3	0.70337	3.7	0.08756	2.9	0.78	-0.042	541.1	15.2	540.8	15.7	539.6	51.3
154	291	1.01	28750	17.4039	2.3	0.65846	4	0.083151	3.3	0.824	-0.19	514.9	16.3	513.7	16.1	508.2	49.6
155	130	0.48	40283	17.5438	4.9	0.68343	6.3	0.086998	4	0.636	-1.6	537.8	20.7	528.8	26	490.5	107.3
159	162	0.87	23310	17.3435	3.3	0.68339	5	0.086	3.7	0.752	-0.5	531.8	19	528.8	20.4	515.8	71.8
160	149	0.56	16500	17.601	3.9	0.67221	5.5	0.08585	3.9	0.712	-1.5	530.9	19.9	522.1	22.4	483.4	85.2
161	659	1.10	134731	17.1709	2.3	0.72261	4.2	0.090031	3.5	0.841	-0.51	555.7	18.8	552.2	17.8	537.7	49.5
162	186	0.65	127808	17.4364	3.1	0.69636	4.2	0.088101	2.8	0.672	-1.3	544.3	14.8	536.6	17.6	504.1	68.7
163	228	0.79	59846	17.1391	2.6	0.71287	4	0.088653	3	0.758	-0.17	547.6	15.8	546.5	16.8	541.8	56.6
167	191	0.59	37467	17.4563	2.6	0.68847	5.8	0.087203	5.2	0.891	-1.1	539	26.9	531.9	24.2	501.6	58.3
168	119	0.51	43962	17.5647	3.7	0.67071	5.3	0.08548	3.8	0.721	-1.3	528.8	19.3	521.1	21.5	487.9	80.7
169	118	0.66	5942	16.5319	6.8	0.71411	8.3	0.08566	4.8	0.576	3.2	529.8	24.4	547.2	35.2	620.1	146.7
171	202	0.94	15573	16.7191	3.8	0.74855	5	0.090809	3.2	0.648	1.2	560.3	17.3	567.4	21.6	595.8	82
172	204	0.64	63503	17.3782	3.1	0.68179	4.3	0.085971	3	0.699	-0.65	531.7	15.5	527.9	17.9	511.4	68.4
173	170	0.56	51605	17.4976	3.4	0.68477	5.2	0.08694	4	0.765	-1.2	537.4	20.5	529.7	21.5	496.3	73.9
174	151	0.53	249909	17.2968	3.4	0.70105	4.8	0.087985	3.5	0.715	-0.68	543.6	18	539.4	20.2	521.7	74.2
178	147	0.55	16043	17.5617	3.9	0.66863	5.2	0.085201	3.4	0.651	-1.3	527.1	17.1	519.9	21.1	488.3	86.7
179	120	0.53	11891	17.6027	4.8	0.68006	5.8	0.08686	3.2	0.552	-1.8	536.9	16.4	526.8	23.7	483.2	106
181	167	0.52	61590	17.2937	3.1	0.70198	4.2	0.088086	2.9	0.675	-0.71	544.2	14.9	540	17.8	522.1	68.7
182	123	0.53	62342	17.2017	3.8	0.70027	5.2	0.087403	3.6	0.691	-0.2	540.2	18.7	539	21.8	533.8	82.6
183	147	0.56	64812	17.1781	3.5	0.70154	5.5	0.087442	4.2	0.765	-0.11	540.4	21.8	539.7	23	536.8	77.5
184	194	0.66	284438	17.5654	3	0.69235	4.3	0.088242	3.1	0.719	-1.8	545.1	16	534.2	17.7	487.8	65.2
185	162	0.56	63235	17.4254	2	0.69119	3.3	0.087392	2.6	0.796	-1	540.1	13.5	533.5	13.6	505.5	43.5
186	134	0.68	11956	17.6937	3.8	0.67544	6.4	0.086716	5.1	0.803	-1.9	536.1	26.5	524	26.2	471.7	84.6
188	200	0.59	513440	17.4089	2.4	0.6872	4.5	0.086805	3.8	0.846	-0.83	536.6	19.4	531.1	18.4	507.6	52.2
189	191	0.55	24380	17.4944	3.1	0.71101	4.6	0.090255	3.5	0.748	-1.8	557	18.5	545.3	19.5	496.8	67.5
191	179	0.49	17652	17.5136	3.6	0.6854	5.7	0.087099	4.5	0.782	-1.3	538.4	23.2	530	23.7	494.3	78.9
192	176	0.68	9113	17.426	4.9	0.70578	5.6	0.08924	2.9	0.51	-1.6	551	15.2	542.2	23.7	505.4	106.8
195	79	0.66	14011	17.4478	5.7	0.65203	7.4	0.082548	4.7	0.64	-0.3	511.3	23.2	509.7	29.6	502.7	125
196	220	0.64	39559	17.4289	2.5	0.71239	4.2	0.090092	3.4	0.805	-1.5	556.1	18	546.2	17.7	505	54.7
199	170	0.53	171301	17.018	3.7	0.69464	4.9	0.085775	3.1	0.645	0.9	530.5	16	535.6	20.3	557.3	81.3
201	173	0.57	14424	17.5352	4.4	0.68943	6.3	0.08772	4.5	0.719	-1.6	542	23.4	532.5	26	491.6	96.1
203	149	0.54	76730	17.443	3.2	0.6839	4.6	0.086558	3.3	0.714	-1	535.1	16.8	529.1	18.9	503.2	70.5
205	47	0.67	15170	16.765	5.6	0.68955	9.3	0.083881	7.4	0.8	2.2	519.2	37.1	532.5	38.6	589.9	121.3
208	155	0.57	29573	17.3292	3.8	0.69346	5	0.087196	3.2	0.646	-0.71	538.9	16.8	534.9	20.9	517.6	84.3
210	195	0.77	74753	16.8582	2.2	0.72035	4.4	0.088115	3.8	0.862	0.95	544.4	19.6	550.9	18.5	577.8	48
214	308	1.01	29461	16.8792	2.8	0.66728	4	0.081725	2.9	0.719	2.2	506.4	14	519.1	16.2	575.1	60.2
218	193	0.94	54466	17.3454	2.7	0.70496	4.8	0.088724	4	0.831	-0.92	548	21.1	541.7	20.3	515.6	59.1
219	159	0.71	46533	17.1047	4	0.70494	5.9	0.087491	4.3	0.731	0.17	540.7	22.2	541.7	24.6	546.2	87.2
223	208	0.54	30170	17.1164	3.1	0.6955	4.7	0.086379	3.6	0.759	0.32	534.1	18.2	536.1	19.5	544.7	66.7
224	144	0.89	45754	17.5995	3.4	0.68041	5.1	0.086889	3.8	0.743	-1.6	537.1	19.3	527	20.8	483.6	74.7
225	194	0.54	123513	16.7807	3.5	0.71027	5.3	0.086482	3.9	0.741	1.7	534.7	20.1	544.9	22.3	587.8	77
228	170	0.53	139136	17.3834	2.9	0.6688	6	0.084358	5.2	0.875	-0.33	522.1	26.2	520	24.3	510.8	63.5
229	122	0.76	7756	17.5936	6.1	0.68816	7.4	0.087849	4.2	0.566	-2	542.8	21.8	531.7	30.7	484.3	134.8
231	185	0.62	47581	17.2199	2.4	0.70448	3.8	0.088023	2.9	0.777	-0.37	543.8	15.3	541.5	15.8	531.5	51.9
233	145	0.47	54967	17.6624	2.9	0.66823	4.6	0.085638	3.5	0.772	-1.6	529.7	17.9	519.6	18.5	475.7	64
234	221	0.76	41870	17.1654	2	0.68753	3.7	0.085633	3.1	0.839	0.25	529.7	15.9	531.3	15.4	538.4	44.5
235	317	0.93	158781	17.2693	2.5	0.69689	3.9	0.087324	3	0.768	-0.43	539.7	15.4	536.9	16.1	525.2	54.3
236	142	0.50	27665	17.7123	3.6	0.66106	5.3	0.084959	3.9	0.733	-1.7	525.7	19.6	515.3	21.4	469.4	79.7
237	141	0.79	10123	17.4236	5.5	0.6666	6.7	0.084275	3.8	0.572	-0.55	521.6	19.1	518.6	27.1	505.7	120.5
240	153	0.80	48063	17.245	4.4	0.69023	6.2	0.086368	4.3	0.696	-0.19	534	22.1	532.9	25.7	528.3	97.3
243	306	1.02	83593	17.2066	2.8	0.73097	3.9	0.091262	2.8	0.699	-0.92	563	14.9	557.1	16.9	533.2	61.7
244	146	0.49	13610	17.5114	4.5	0.67881	6.4	0.08625	4.5	0.703	-1.2	533.3	23	526.1	26.2	494.6	100.2
248	151	0.81	118557	17.223	3.8	0.67695	5.6	0.084598	4	0.721	0.25	523.5	20.1	524.9	22.8	531.1	84.3
249	127	0.62	13904	17.4267	4.6	0.68394	6.1	0.086483	3.9	0.65	-0.98	534.7	20.2	529.2	25	505.3	101.6
251	132	0.72	208845	16.8385	2.7	0.70173	3.9	0.085737	2.8	0.728	1.6	530.3	14.4	539.8	16.2	580.4	57.7
252	140	0.51	43929	17.1448	3.1	0.68942	4.7	0.085765	3.6	0.756	0.32	530.4	18.1	532.5	19.5	541.1	67.2
255	93	0.34	6449	17.5196	7.1	0.64726	8.3	0.08228	4.2	0.509	-0.56	509.7	20.6	506.8	32.9	493.6	156.8
259	177	0.50	41057	17.2858	3.9	0.67742	6.3	0.084965	5	0.791	-0.082	525.7	25.2	525.2	25.9	523.1	84.8
262	206	0.69	16086	17.1094	4.2	0.70614	5.5	0.087664	3.5	0.645	0.13	541.7	18.3	542.5	22.9	545.6	91
266	133	0.76	25796	17.4683	3.9	0.67977	5.3	0.08616	3.6	0.675	-1.1	532.8	18.4	526.6	21.9	500.1	86.6
268	233	0.56	11201	17.537	2.7	0.68806	3.8	0.087554	2.6	0.702	-1.6	541.1	13.7	531.6	15.5	491.4	58.9
271	159	0.80	19443	17.5681	3.3	0.67927	4.9	0.086588	3.5	0.726	-1.5	535.3	18.1	526.3	19.9	487.5	73.6
272	117	0.56	44060	17.1303	4.1	0.67615	6.1	0.084043	4.6	0.749	0.72	520.2	23	524.4	25.1	542.9	88.7
273	101	0.67	204398	17.325	3.8	0.73605	5.8	0.092528	4.5	0.767	-1.5	570.5	24.5	560.1	25.2	518.1	82.4
275	197	0.54	50473	17.3304	3.1	0.68304	4.3	0.085891	3	0.686	-0.44	531.2	15.1	528.6	17.8	517.5	68.8
277	111	0.80	30244	17.5812	4.2	0.68814	7	0.087784	5.6	0.796	-1.6	542.4	28.9	531.7	28.9	485.9	93.5
279	224	0.63	19983	17.3674	3.1	0.68447	3.8	0.086255	2.2	0.591	-0.71	533.4	11.5	529.5	15.7	512.8	67.3
280	103	0.54	13437	17.666	3.9	0.67189	5.9	0.086125	4.4	0.756	-1.8	532.6	22.7	521.9	24	475.2	85.3
284	194	0.66	67825	17.2575	2.8	0.6929	5.5	0.086764	4.7	0.862	-0.27	536.4	24.3	534.5	22.8	526.7	61
285	157	0.88	75681	17.14	3.5	0.68265	4.7	0.084899	3	0.652	0.56	525.3	15.3	528.4	19.2	541.7	77.2
287	873	1.09	434337	17.1901	1.9	0.69837	3.4	0.087108	2.8	0.83	-0.089	538.4	14.7	537.8	14.3	535.3	41.9
288	263	0.78	73675	16.9674	3.5	0.67931	5.6	0.083634	4.4	0.781	1.4	517.8	22	526.4	23.2	563.7	76.8
289	166	0.81	29287	16.5668	2.8	0.72948	4.1	0.087689	3	0.727	2.4	541.9	15.6	556.2	17.7	615.6	61.1
290	194	0.51	60107	17.3141	2.3	0.69636	4	0.087483	3.3	0.826	-0.6	540.6	17.2	536.6	16.8	519.5	49.8
291	166	0.50	8929	17.521	5.3	0.63862	6.2	0.081189	3.1	0.505	-0.35	503.2	15.1	501.5	24.5	493.4	117.7
292	146	0.52	135674	17.0848	4.2	0.68705	5.4	0.085171	3.4	0.632	0.74	526.9	17.4	531	22.5	548.7	92.1
293	268	0.55	20134	17.4282	3.4	0.68231	4.7	0.086284	3.2	0.68	-0.91	533.5	16.2	528.2	19.2	505.1	75.2
297	174	0.68	45351	17.2822	3.5	0.66739	4.8	0.08369	3.2	0.672	0.18	518.1	15.9	519.1	19.3	523.6	77.2
298	314	0.66	53197	17.0387	2.7	0.70208	4.1	0.0868	3.1	0.755	0.56	536.6	15.9	540	17.2	554.6	58.6
305	184	0.68	37490	17.3643	3.7	0.70118	5	0.088345	3.3	0.672	-1.1	545.7	17.4	539.5	20.7	513.2	80.7
308	162	0.61	45349	17.2823	3.8	0.68846	5.7	0.086333	4.2	0.745	-0.31	533.8	21.7	531.9	23.5	523.6	83.1
309	149	0.52	82216	17.0111	3	0.70206	5.4	0.086656	4.4	0.827	0.66	535.7	22.8	540	22.5	558.1	65.7
310	233	0.85	34723	17.4773	2.9	0.68726	4.2	0.087154	3	0.714	-1.2	538.7	15.4	531.2	17.3	498.9	64.5
311	397	1.35	50596	17.1088	2.8	0.66458	5	0.082502	4.1	0.824	1	511	20.1	517.4	20.2	545.6	61.6
312	200	0.85	55043	17.1406	3.1	0.7555	6.8	0.093962	6.1	0.889	-1.1	578.9	33.6	571.4	29.8	541.6	68.2
313	153	0.83	103967	17.092	3.1	0.73789	5.2	0.091512	4.2	0.801	-0.48	564.5	22.7	561.2	22.6	547.8	68.4
314	167	0.48	55448	17.1168	4.1	0.69817	5.8	0.086711	4.1	0.707	0.28	536.1	21.1	537.7	24.2	544.6	89.7
315	235	0.61	57934	17.2365	3	0.69125	4.5	0.086453	3.4	0.744	-0.15	534.5	17.2	533.6	18.7	529.4	65.9

Notes:

[a]Concordia distance (d_c) was calculated using IsoplotR (Vermeesch, 2018), and we discarded analyses outside of the range $-2 < d_c < 4.6$ (Vermeesch, 2021).