

Supplemental Material Table 1: Details for Table 1 of the paper.

Ichnotaxon	Biological Counterpart (Trackmaker)
<i>Ameghinichnus</i>	advanced synapsid, possibly trithelodontid (1)
<i>Rhynchosauroides hyperbates</i>	lepidosauromorph or primitive archosauromorph (2,3)
<i>Rhynchosauroides</i> spp.	lepidosauromorphs (2,3)
<i>Chirotherium lulli</i>	crurotarsan, possibly aetosaurid (4)
<i>Procolophonichnium</i>	procolophonid parareptile (5)
<i>Gwyneddichnium</i>	tanystropheid (6)
<i>Apatopus</i>	phytosaur (3)
<i>Brachychirotherium parvum</i>	rauisuchian crurotarsan (7)
new taxon B	crurotarsan, possibly crocodylomorph (8)
<i>Batrachopus deweyii</i>	crocodylomorph (9)
“ <i>Batrachopus</i> ” <i>gracilis</i>	crocodylomorph (9)
unnamed dinosaurian genus 1	unknown dinosaur, perhaps herrerasaurid
<i>Otozoum</i>	prosauropod dinosaurs (10,11)
“ <i>Grallator</i> ”	small theropod dinosaur (12)
“ <i>Anchisauripus</i> ”	small to medium sized theropod dinosaur (12)
<i>Eubrontes giganteus</i>	large theropod dinosaur (12)
<i>Atreipus</i> spp.	ornithischian dinosaur (13)
<i>Anomoepus scambus</i>	ornithischian dinosaur (14)

Supplementary Materials: Table 2: Ages and localities for Figure 2 of paper and Figures 1 and 2 of supplementary materials. na, indicates that although many tracks are known from the locality and are in various institutions, we have not attempted to quantify their numbers for this study; Maximum size is based on a survey of the largest of the specimens (¹⁵).

Ichnotaxa

age Ma	Formation	Abbreviation	Basin	Locality	Age	Ichnotaxa	#Non-Dinosaur Tracks	#Dinosaur Tracks	%Dinosaur Tracks	Max. Theropod Track Size	#Non-Dinosaur Taxa	#Dinosaur Taxa	%Dinosaur Taxa	Comments
199	Portland	1	Hartford	Stony Brook, Kelsey Furguson Quarry, Simsbury, CT	Hettangian-Sinemurian	<i>Batrachopus deweyii</i> , <i>Grallator parallelus</i> , <i>Anchisauripus tuberosus</i> , <i>Eubrontes giganteus</i> , <i>Otozoum moodii</i> , <i>Anomoepus scambus</i>	na	na	na	34	1	5	83	(16)
199	McCoy Brook	2	Fundy	Five Islands Provincial Park, Blue Sac shore	Hettangian-Sinemurian	<i>Batrachopus deweyii</i> , <i>Batrachopus gracilis</i> , <i>Grallator parallelus</i> , <i>Anchisauripus tuberosus</i> , <i>Eubrontes giganteus</i> , <i>Anomoepus scambus</i> , <i>Otozoum moodii</i>	na	na	na	35	2	5	71	(14,27)
200	Portland	3	Hartford	Chicopee, MA	Hettangian-Sinemurian	<i>Batrachopus deweyii</i> , <i>Grallator parallelus</i> , <i>Anchisauripus tuberosus</i> , <i>Anomoepus scambus</i>	na	na	na	20	1	3	75	(revised from ref. 17)
200	Turners Falls	4	Deerfield	Stoughton Quarry, Montague, MA	Hettangian	<i>Batrachopus deweyii</i> , <i>Batrachopus gracilis</i> , <i>Grallator parallelus</i> , <i>Anchisauripus tuberosus</i> , <i>Eubrontes giganteus</i>	na	na	na	35	2	3	60	(revised from ref. 17,)
200	Turners Falls	5	Deerfield	Barton Cove, Lily Pond, Gill, MA	Hettangian	<i>Batrachopus deweyii</i> , <i>Batrachopus gracilis</i> , <i>Grallator parallelus</i> , <i>Anchisauripus tuberosus</i> , <i>Eubrontes giganteus</i> , <i>Anomoepus scambus</i>	na	na	na	35	2	4	67	(revised from ref. 17)
201	Portland	6	Hartford	Portland brownstone Quarry, Portland, CT	Hettangian	<i>Batrachopus deweyii</i> , <i>Grallator parallelus</i> , <i>Anchisauripus tuberosus</i> , <i>Anomoepus scambus</i> , <i>Otozoum moodii</i>	na	na	na	25	1	4	80	(revised from ref. 17)
201	Boonton	7	Newark	Boonton Dam, Boonton, NJ	Hettangian	<i>Batrachopus deweyii</i> , <i>Grallator parallelus</i> , <i>Anchisauripus tuberosus</i> , <i>Eubrontes giganteus</i> , <i>Anomoepus scambus</i>	1	9	82	35	1	4	80	youngest Newark basin assemblage (16)

201	Towaco	8	Newark	Riker Hill Quarry, Roseland, NJ	Hettangian	<i>Ameghinichnus</i> n. sp., <i>Batrachopus deweyii</i> , <i>Grallator parallelus</i> , <i>Anchisauripus tuberosus</i> , <i>Eubrontes giganteus</i> , <i>Anomoepus scambus</i>	100	1400	93	35	2	4	67	the most densely sampled locality in Newark basin (17)
201	Towaco	9	Newark	Stephen Drive, Montville, NJ	Hettangian	<i>Rhynchosaurooides</i> sp., <i>Grallator parallelus</i> , <i>Anchisauripus tuberosus</i>	1	9	82	20	1	2	67	LA Rhynchosaurooides (16)
201	East Berlin and lower Turners Falls	10	Hartford		Hettangian	<i>Batrachopus deweyii</i> , <i>Grallator parallelus</i> , <i>Anchisauripus tuberosus</i> , <i>Eubrontes giganteus</i> , <i>Anomoepus scambus</i>	na	na	na	36	1	4	80	(revised from ref.17)
201	Towaco	11	Newark	Vreeland Quarry, Montville, NJ	Hettangian	<i>Batrachopus deweyii</i> , <i>Grallator parallelus</i> , <i>Anchisauripus tuberosus</i> , <i>Eubrontes giganteus</i> , <i>Anomoepus scambus</i>	1	404	100	35	1	4	80	(16)
201	Towaco	12	Newark	Toms Point, Lincoln Park, NJ	Hettangian	<i>Batrachopus deweyii</i> , <i>Grallator parallelus</i> , <i>Anchisauripus tuberosus</i> , <i>Eubrontes giganteus</i> , <i>Anomoepus scambus</i>	1	99	98	35	1	4	80	(16)
201	Feltonville	13	Newark	Shrump Quarry, Roseland, NJ	Hettangian	<i>Batrachopus deweyii</i> , <i>Grallator parallelus</i> , <i>Anchisauripus tuberosus</i> , <i>Anomoepus scambus</i>	1	9	82	25	1	3	75	(16)
201	Turkey Run	14	Culpeper	Oak Hill Estate, Aldie, VA	Hettangian	<i>Grallator parallelus</i> , <i>Anchisauripus tuberosus</i> , <i>Eubrontes giganteus</i> , cf. <i>Anomoepus scambus</i>	na	na	na	35	0	4	100	(27)
201	Feltonville	15	Newark	Exeter Golf Course, Exeter, PA	Hettangian	<i>Grallator</i> cf. <i>G. parallelus</i> , <i>Anchisauripus tuberosus</i> , <i>Eubrontes giganteus</i>	0	4	100	33	0	3	100	(16)
201	McCoy Brook	16	Fundy	Wasson Bluff	Hettangian	<i>Batrachopus deweyii</i> , <i>Grallator parallelus</i> , <i>Anchisauripus tuberosus</i> , <i>Eubrontes giganteus</i> , <i>Anomoepus scambus</i> , <i>Otozoum moodii</i>	na	na	na	35	1	5	83	(27)
201	Shuttle Meadow	17	Hartford		Hettangian	<i>Batrachopus deweyii</i> , <i>Grallator parallelus</i> , <i>Anchisauripus tuberosus</i> , <i>Eubrontes giganteus</i>	na	na	na	34	1	3	75	(revised from ref. 17)

201	Midland	18	Culpeper	Licking Run Reservoir, Midland, VA	Hettangian	<i>Grallator parallelus</i> , <i>Anchisauripus tuberosus</i> , <i>Eubrontes giganteus</i> , <i>Batrachopus deweyii</i>	na	na	na	34	1	4	80	(16)
201	Feltonville	19	Newark	Vosseller Rd., Martinsville, NJ	Hettangian	<i>Anchisauripus tuberosus</i> , <i>Eubrontes giganteus</i>	0	6	100	35	0	2	100	oldest interflow assemblage (16)
201	Passaic	20	Newark	Exeter Village, Exeter, PA	Hettangian	<i>Rhynchosauroides</i> sp., <i>Grallator parallelus</i>	1	3	60	11	1	1	50	(16)
201	Passaic	21	Newark	R. H. Hamilton Quarry, and Montclair State Univ., Clifton and Paterson, NJ	Hettangian	<i>Rhynchosauroides</i> n. sp., <i>Batrachopus deweyii</i> , <i>Grallator parallelus</i> , <i>Anchisauripus tuberosus</i> , <i>Eubrontes giganteus</i>	200	1000	83	35	2	3	60	FA, <i>Eubrontes giganteus</i> ; superb specimens of all taxa (16)
202	Passaic	22	Newark	Exeter Village, Exeter, PA	Rhaetian	<i>Batrachopus deweyii</i> , <i>Rhynchosauroides</i> sp., <i>Grallator parallelus</i> , <i>Anchisauripus tuberosus</i>	50	2	4	20	2	2	50	(16)
202	Passaic	23	Newark	Exeter Village, Exeter, PA	Rhaetian	<i>Rhynchosauroides</i> sp., <i>Grallator parallelus</i>	120	60	33	23	1	1	50	(16)
202	Passaic	24	Newark	Friendship Home, Exeter, PA	Rhaetian	<i>Rhynchosauroides</i> sp., <i>Batrachopus gracilis</i> , <i>Apatopus</i> sp., <i>?Brachychirotherium</i> , New taxon B, <i>Grallator parallelus</i> , <i>Anchisauripus tuberosus</i>	20	10	33	20	5	2	29	LA, definite <i>Apatopus</i> sp. modified from ref. (18)
202	Passaic	25	Newark	Friendship Home, Exeter, PA	Rhaetian	<i>Brachychirotherium</i> sp., <i>Grallator parallelus</i>	1	1	50	13	1	1	50	LA, definite <i>Brachychirotherium</i> (16)
202	Passaic	26	Newark	Friendship Home, Exeter, PA	Rhaetian	<i>Rhynchosauroides</i> , <i>Batrachopus gracilis</i> , <i>Brachychirotherium</i> , New taxon B, <i>Grallator parallelus</i> , <i>Anchisauripus tuberosus</i>	150	200	57	22	4	2	33	very good and abundant <i>Brachychirotherium</i> . Modified from ref. (18)

202	Passaic	27	Newark	Wingspread, Exeter, PA	Rhaetian	<i>Rhynchosauroides</i> sp., <i>Gwyneddichnium</i> sp., <i>Batrachopus gracilis</i> , <i>Brachychirotherium</i> , New Taxon B, <i>Grallator parallelus</i> , <i>Anchisauripus tuberosus</i>	~50	100	67	20	5	2	29	LA, <i>Gwyneddichnium</i> , very good <i>Anchisauripus tuberosus</i> . Modified from ref. (18)
202	Passaic	28	Newark	Type Pine Ridge, Exeter, PA	Rhaetian	<i>Grallator parallelus</i>	0	4	100	12	0	1	100	(16)
202	Passaic	29	Newark	Pathfinder Meadows, Exeter	Rhaetian	<i>Grallator parallelus</i>	0	2	100	11	0	1	100	(16)
202	Passaic	30	Newark	Pathfinder Meadows, Exeter Township	Rhaetian	NewTaxon B, ? <i>Brachychirotherium</i> sp., <i>Rhynchosauroides</i> sp., <i>Grallator parallelus</i>	5	30	86	17	3	1	25	major reptile bone site (26,16)
202	Passaic	31	Newark	West Orange, NJ	Rhaetian	<i>Apatopus</i> sp.	1	0	0	na	1	0	0	(19)
204	Passaic	32	Newark	Heister's Creek, Exeter Township, PA	Rhaetian	<i>Rhynchosauroides</i> sp., New Taxon B, ? <i>Gwyneddichnium</i> sp., <i>Grallator parallelus</i>	4	75	95	9	3	1	25	Modified from ref. (8)
204	Passaic	33	Newark	Tulpehocken Rd., Exeter Township	Rhaetian	<i>Grallator parallelus</i>	0	2	100	16	0	1	100	(16)
204	Passaic	34	Newark	Shelbourn Square, Exeter Township, PA	Rhaetian	<i>Rhynchosauroides</i> sp., New Taxon B, <i>Batrachopus gracilis</i> , <i>Brachychirotherium</i> sp., <i>Grallator parallelus</i>	10	20	67	9	4	1	20	Modified from ref. (8)
205	Passaic	35	Newark	Valley Ridge, Exeter Township, PA	Rhaetian	<i>Grallator parallelus</i>	0	12	100	9	0	1	100	(16)
205	Passaic	36	Newark	Fairview Chapel, Exeter Township, PA	Rhaetian	<i>Rhynchosauroides</i> sp.	20	0	0	na	1	0	0	(16)
206	Passaic	37	Newark	Passaic, NJ	Rhaetian	<i>Procolophonichnium</i> sp., ? <i>Gwyneddichnium</i> sp.	3	0	0	na	2	0	0	(19)

206	Passaic	38	Newark	Furnace Hill, Exeter Township, PA	Rhaetian	<i>Rhynchosauroides</i> sp., <i>Batrachopus</i> cf. <i>B. gracilis</i> , <i>Brachychirotherium</i> sp., <i>Chirotherium lulli</i> , <i>Atreipus</i> sp., <i>Grallator parallelus</i>	75	40	35	10	6	1	14	modified from Szajna and Hartline (20) LA <i>C. lulli</i> , LA <i>Atreipus</i>
206	Blomidon	39	Fundy	Red Head, Rossway, Nova Scotia	?Rhaetian	<i>Rhynchosauroides</i> sp., <i>Apatopus</i> cf. <i>A. lineatus</i> , <i>Brachychirotherium</i> , cf. <i>Atreipus</i> sp., <i>Grallator parallelus</i> , <i>Anchisauripus tuberosus</i>	na	na	na	18	3	3	50	(27)
207	Passaic	40	Newark	Monacacy Hill, Amity Township, PA	?Rhaetian	<i>Rhynchosauroides</i> sp., <i>Brachychirotherium</i> sp., <i>Atreipus</i> sp.	8	2	20	na	2	1	33	(16)
208	Passaic	41	Newark	Victoria Hill, Amity Township, PA	?Rhaetian	<i>Rhynchosauroides</i> sp., <i>Apatopus lineatus</i> , New Taxon B, <i>Grallator parallelus</i> , <i>Anchisauripus tuberosus</i>	7	5	42	25	3	2	40	FA <i>Batrachopus</i> cf. <i>B. gracilis</i> (16)
208	Passaic	42	Newark	Douglassville, Amity Township, PA	?Norian	<i>Rhynchosauroides</i> sp., <i>Gwyneddichnium</i> sp., ? <i>Batrachopus</i> sp., <i>Brachychirotherium</i> sp., <i>Atreipus</i> sp., <i>Grallator parallelus</i>	5	200	98	10	4	2	33	modified from ref. (8)
209	Balls Bluff	43	Culpeper	Floris, VA	Norian	<i>Apatopus</i> sp.	na	na	na	na	1	0	0	(21)
209	Balls Bluff	44	Culpeper	Manassas National Park, VA	Norian	<i>Rhynchosauroides</i> sp.	na	na	na	na	1	0	0	(22)
210	Passaic	45	Newark	East Greenville	Norian	<i>Atreipus</i> sp.	0	6	100	14	0	1	100	(16)
211	Balls Bluff	46	Culpeper	Culpeper Crushed Stone Quarry, Stevensburg, VA	Norian	<i>Rhynchosauroides</i> sp., <i>Brachychirotherium</i> spp., <i>Anchisauripus tuberosus</i> , <i>Anchisauripus</i> sp.	na	na	na	25	2	2	50	(23)
211	Passaic	47	Newark	Rutherford, NJ	Norian	<i>Rhynchosauroides</i> sp., <i>Apatopus</i> sp., <i>Brachychirotherium</i> sp., unnamed dinosaurian genus 1, <i>Atreipus</i> sp., <i>Grallator parallelus</i> , <i>Anchisauripus tuberosus</i>	50	50	50	16	3	4	57	FA <i>Anchisauripus tuberosus</i> Modified from ref. (13)

Supplementary Material

214	Passaic	48	Newark	Limrick Airport Business Campus, Limerick, PA	Norian	<i>Rhynchosauroides</i> sp., <i>Atreipus</i> sp., <i>Grallator parallelus</i>	6	6	50	5	1	2	67	(16)
214	Passaic	49	Newark	Sanatoga Commons, Liberty Hill, Sanatoga, PA	Norian	<i>Gwyneddichnium</i> sp., <i>Atreipus</i> sp.	2	2	50	11	1	1	50	(16)
214	Passaic	50	Newark	Sanatoga Auto Body Shop, Sanatoga, PA	Norian	<i>Rhynchosauroides</i> sp., <i>Brachychirotherium</i> sp., <i>Atreipus</i> sp.	32	8	20	14	2	1	33	(16)
215	Passaic	51	Newark	Smith-Clark Quarry, Milford, NJ	Norian	<i>Rhynchosauroides</i> sp., <i>R. hyperbates</i> , <i>Apatopus lineatus</i> , <i>Chirotherium lulli</i> , <i>Brachychirotherium</i> sp., <i>Atreipus</i> sp., <i>Grallator parallelus</i> , new genus 2	25	200	89	12	5	4	44	FA <i>C. lulli</i> . Modified from ref. (13)
215	Passaic	52	Newark	Sanatoga Quarry, Sanatoga, PA	Norian	<i>Rhynchosauroides</i> sp., <i>Brachychirotherium</i> sp., <i>Atreipus acadianus</i> , New Genus 1	900	250	22	10	2	2	50	Modified from ref. (13)
215	Blomidon	53	Fundy	Paddy Island area, Medford, Nova Scotia	Norian	<i>Rhynchosauroides</i> sp., <i>R. hyperbates</i> , <i>Apatopus lineatus</i> , <i>Chirotherium lulli</i> , <i>Brachychirotherium</i> , <i>Atreipus</i> , unnamed dinosaurian genus 1	na	na	na	na	5	3	38	
216	Passaic	54	Newark	Heather Glen, Limerick, PA	Norian	<i>Rhynchosauroides</i> sp., <i>Atreipus</i> sp.	12	3	20	12	1	1	50	(16)
216	Passaic	55	Newark	Graterford Prison, Graterford, PA	Norian	<i>Rhynchosauroides</i> sp., <i>Atreipus</i> sp.	20	200	91	12	1	1	50	
217	Passaic	56	Newark	Nishisackawick Creek,	Carno-Norian	<i>Rhynchosauroides</i> sp., <i>Brachychirotherium</i> sp., <i>Atreipus</i> sp.	50	80	62	13	2	1	33	Modified from ref. (13)

217	Passaic	57	Newark	Mainland, PA	Carno-Norian	<i>Rhynchosauroides</i> sp., <i>Gwyneddichnium</i> sp., <i>Brachychirotherium</i> sp., <i>Atreipus</i> sp., <i>Grallator parallelus</i>	20	25	56	10	3	2	40	(16)
217	Passaic	58	Newark	Ridge Pike & Township Ln. Rd., Trappe, PA	Carno-Norian	<i>Rhynchosauroides</i> sp., <i>Brachychirotherium</i> sp., <i>Atreipus</i> sp., <i>Grallator parallelus</i>	38	12	24	10	2	2	50	(16)
218	Passaic	59	Newark	Blooming Glen Quarry, Blooming Glen, PA	Carnian	<i>Rhynchosauroides</i> sp., <i>Apatopus lineatus</i> , <i>Gwyneddichnium</i> sp., <i>Brachychirotherium</i> sp., <i>Atreipus</i> sp.	21	6	22	15	4	1	20	(16)
219	Lokatong	60	Newark	Upper Fairview, PA	Carnian	<i>Rhynchosauroides</i> sp., <i>Brachychirotherium</i> sp., indt. dinosaur	28	2	7	na	2	1	33	(16)
221	Lokatong	61	Newark	Arcola, PA	Carnian	<i>Rhynchosauroides</i> sp., <i>R. hyperbates</i> , <i>Gwyneddichnium</i> sp., <i>Apatopus</i> sp., <i>Brachychirotherium</i> sp., <i>Atreipus</i> sp., <i>Grallator parallelus</i>	200	10	5	12	5	2	29	FA <i>R. hyperbates</i> , Modified from ref. (13)
222	Lokatong	62	Newark	Gwynedd, PA	Carnian	<i>Gwyneddichnium</i> sp., ? <i>Atreipus</i> sp.	20	2	9	12	1	1	50	FA <i>Gwyneddichnium</i> (13)
222	Stockton	63	Newark	Grandview and South Nyack, NY	Carnian	<i>Brachychirotherium</i> sp., <i>Atreipus</i> sp.	4	2	33	12	1	1	50	(16)
222	Stockton	64	Newark	Haverstraw (south), NY	Carnian	<i>Brachychirotherium</i> sp., <i>Grallator parallelus</i>	3	2	40	7	1	1	50	FA <i>Grallator parallelus</i> . Modified from ref. (24)
222	Stockton	65	Newark	Haverstraw (north), NY	Carnian	<i>Rhynchosauroides</i> sp., <i>Apatopus</i> sp., <i>Brachychirotherium</i> sp., <i>Atreipus</i> sp., ? <i>Grallator parallelus</i> sp.	10	4	29	9	3	2	40	FA listed taxa; oldest Newark basin track assemblage? Modified from ref. (24)

Age Ma	Formation	Abbreviation	Basin	Locality	Age	Osteological Taxon	Comments
199	Portland	66	Hartford	Hines Quarry, Longmeadow, MA	Sinemurian	protosuchian <i>Stegomus longipes</i>	type specimen, partial skeleton and skull (17)
201	McCoy Brook	67	Fundy	Wasson Bluff, Cumberland County, Nova Scotia	Hettangian	protosuchian <i>Protosuchus micmac</i>	Abundant skeletal elements, site also has produced abundant prosauropod dinosaurs, rare ornithischian and possible theropod dinosaur teeth and bones, and abundant sphenosuchian skeletons and elements, and rare trithelodonts (25)
202	Passaic	68	Newark	Pathfinder Meadows, Exeter Township	Rhaetian	protosuchian <i>Protosuchus</i> sp., <i>Hypsognathus fennerii</i>	<i>Protosuchus</i> : osteoderms, jaw, postcranial fragments. <i>Hypsognathus</i> , abundant skulls, partial skeletons and individual bones and teeth (16)
202	Passaic	69	Newark	Walnut Street, Exeter Township, PA	Rhaetian	phytosauria indet.	teeth (16)
202	Passaic	70	Newark	Clifton, NJ	Rhaetian	<i>Hypsognathus fennerii</i>	type specimen, partial skeleton and mandibles (26)
205	Passaic	71	Newark	Passaic, NJ	Rhaetian	<i>Hypsognathus fennerii</i>	several partial skulls and skeletons (26)
206	Passaic	72	Newark	Passaic, NJ	Rhaetian	<i>Hypsognathus fennerii</i>	partial skull (26)
206	Blomidon	73	Fundy	Red Head, Rossway, Annapolis Co., Nova Scotia	Norian-Rhaetian	phytosauria indet.	rostrum, fragmentary mandible, osteoderm (27)
210	Passaic	74	Newark	East Greenville	Norian	<i>Hypsognathus fennerii</i>	partial skull (26)
211	Passaic	75	Newark	Hosensack Creek, lower Milford, PA	Norian	phytosaur: <i>Clepsysaurus pennsylvanicus</i>	teeth, skull and postcranial fragments (28)
214	Passaic	76	Newark	Sanatoga Auto Body Shop, Sanatoga, PA	Norian	phytosauria indet.	postcranial elements and teeth (16)
215	Passaic	77	Newark	Smith-Clark Quarry, Milford, NJ	Norian	phytosauria indet.	tooth (16)
215	Blomidon	78	Fundy	Paddy Island area, Medford, Nova Scotia	Norian	<i>Hypsognathus</i> cf. <i>H. fennerii</i>	Complete skull and fragmentary postcranial elements, partial mandible (26)
221	Locketong	79	Newark	Granton Quarry, North Bergen, NJ	Carnian	phytosaur, cf. <i>Rutiodon</i>	partial juvenile skull (29)
222	Stockton	80	Newark	Edgewater, NJ	Carnian	<i>Rutiodon manhattanensis</i>	partial postcranial skeleton (30)

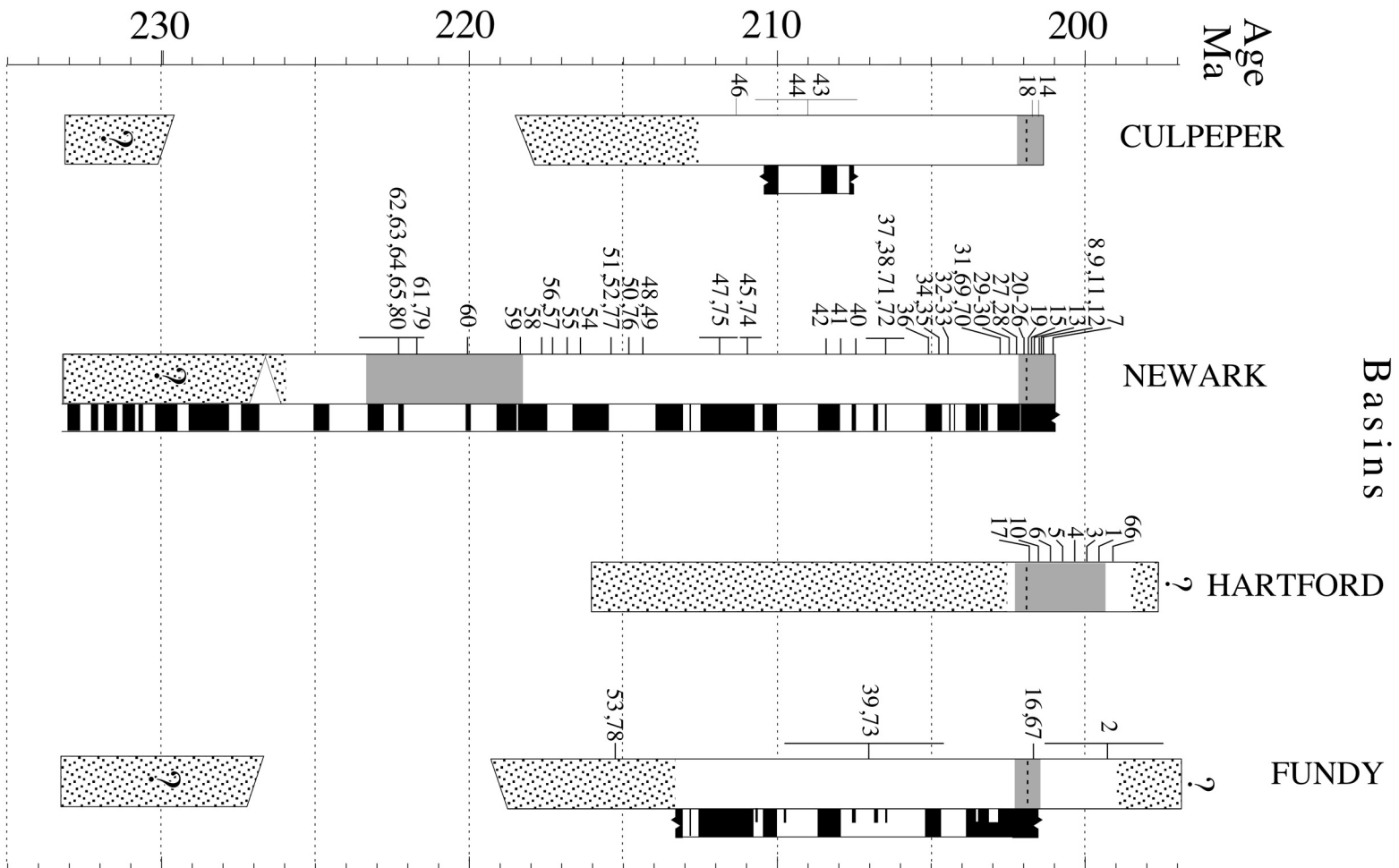


Figure 1

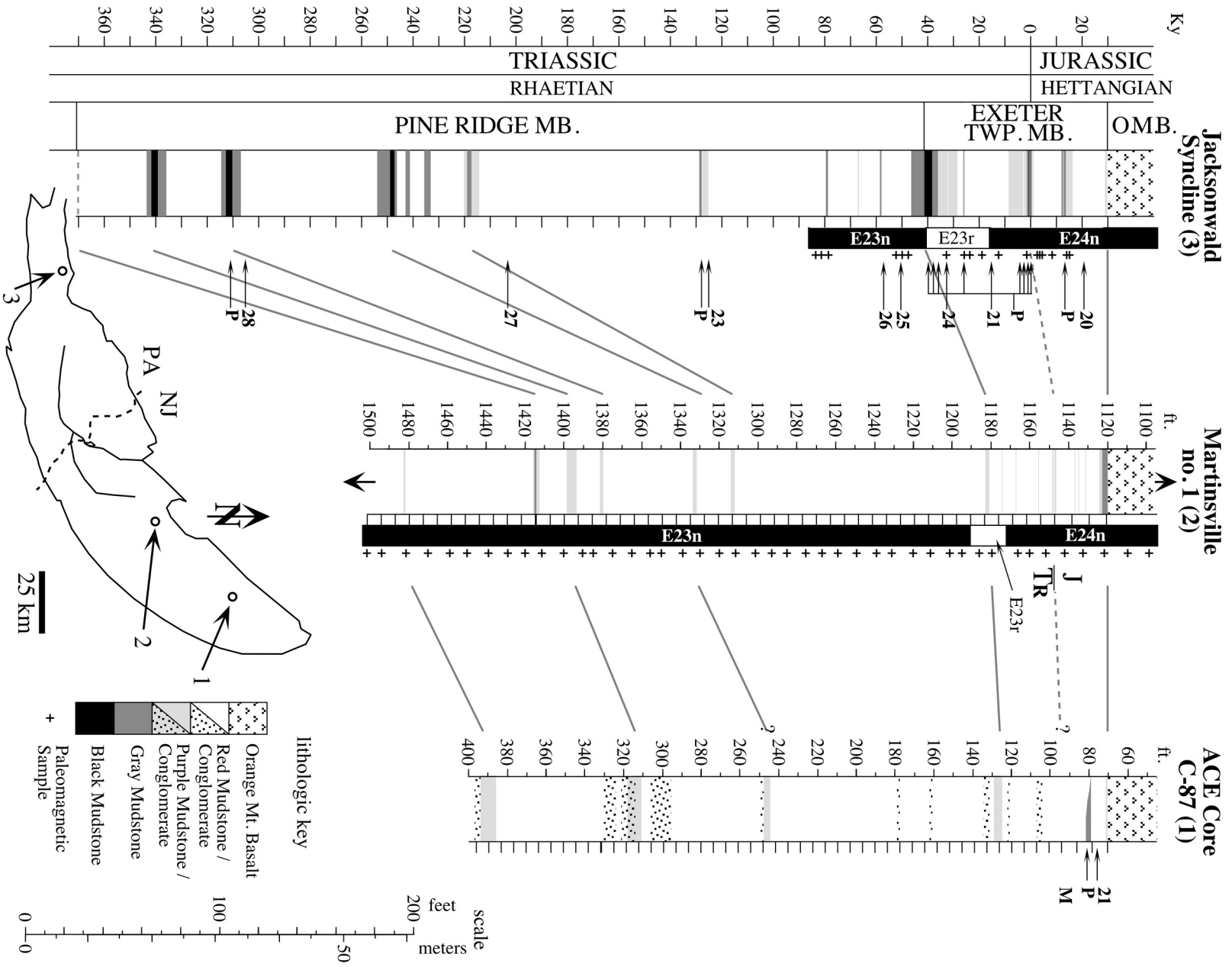


Figure 2

Jacksonwald Syncline Triassic-Jurassic Boundary

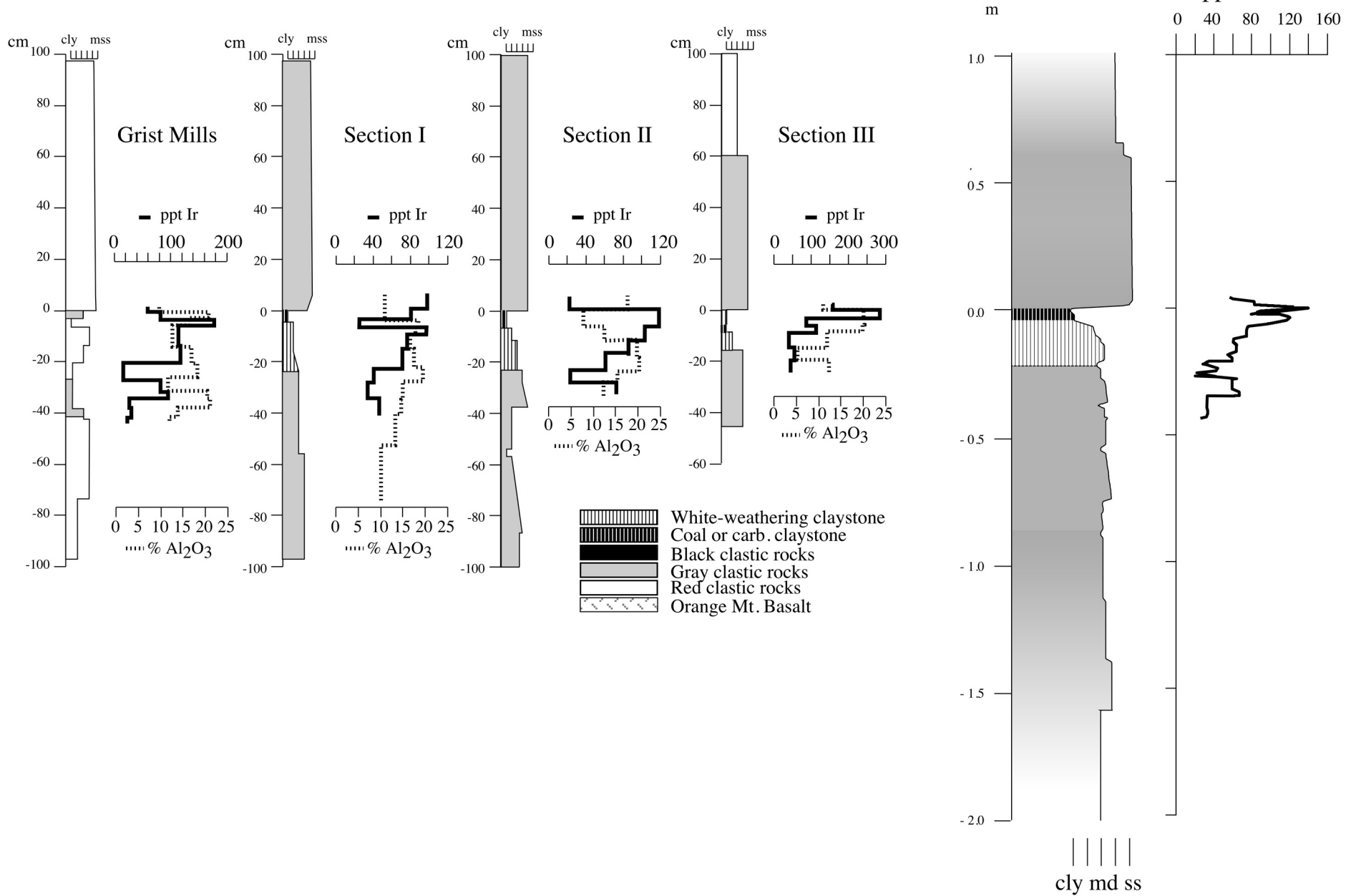


Figure 3

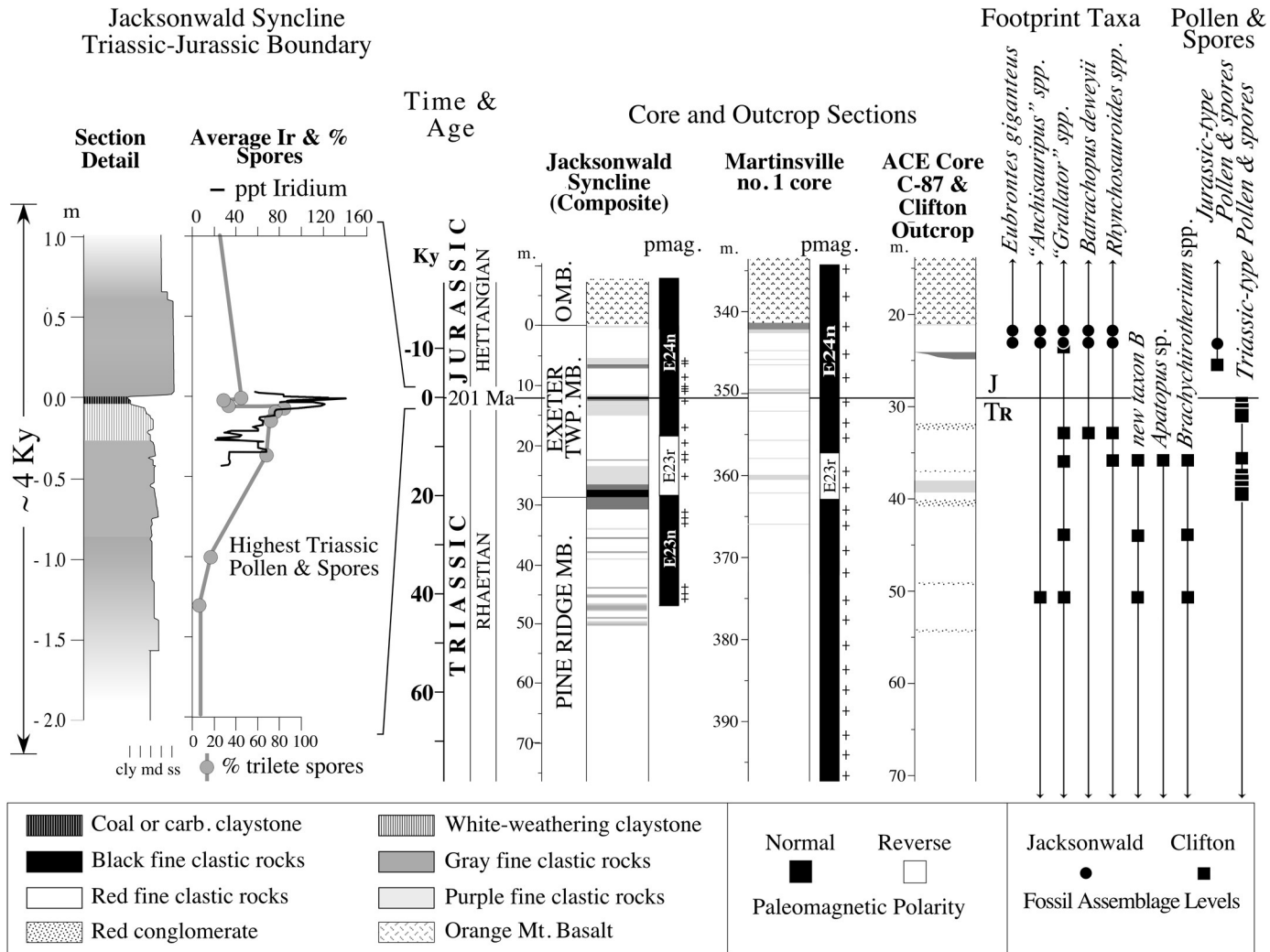


Figure 4

Supplemental Material Table 4: Average Ir values for the four sites in Supplemental Material Figure 3 and Table 4 (32).

Depth (cm)	average IR
-2	59.0
-1	84.0
0	84.0
1	141.2
2	91.1
3	80.9
4	109.8
5	121.9
6	118.1
7	101.5
8	77.0
9	75.8
10	75.8
11	75.8
12	75.8
13	62.0
14	62.0
15	66.3
16	65.0
17	65.0
18	65.0
19	55.5
20	60.8
21	60.8
22	36.5
23	30.0
24	46.7
25	43.7
26	43.7
27	43.7
28	65.0
29	61.0
30	61.0
31	61.0
32	61.0
33	68.0
34	68.0
35	68.0
36	33.5
37	33.5
38	33.5
39	33.5
40	34.5
41	34.5
42	34.5
43	34.5
44	32.0
45	25.0

Captions for Supplemental Material

Supplemental Material Figure 1, Detailed locality information for Figure 1 of paper. Numbers adjacent to ticks at specific stratigraphic levels refer to localities listed in Supplemental Material Table 2.

Supplemental Material Figure 2: Detailed sections for footprint localities (numbers), pollen- and spore-producing levels (P), and microfossil plant localities (M). Numbers for footprint localities refer to Supplemental Material Table 2.

Supplemental Material Figure 3: Measured sections for four along strike sections and the average Ir concentrations (34, 35). Data from Supplemental Material Tables 2, 3, and 4. Note that the highest Ir levels tend to be associated with the white-weathering claystone or adjacent coaly unit (Sections 1-III). However, in the Grist Mills section, the highest Ir is within a red claystone under a light gray siltstone. We believe this red claystone correlates with some part of the white claystone in the other sections, but contains hematite because it was formed under a more oxidizing environment, closer to the border fault. In addition, there is another gray claystone lower in the Grist Mills section without an adjacent Ir anomaly. Because, red units have the lowest organic C content (oxidizing depositional and diagenetic environment) and black units the highest organic C content (reducing depositional and diagenetic environment), it is clear that there is no consistent pattern between the Ir anomaly and redox state of the strata, arguing against a diagenetic origin of the Ir anomaly. Note also that the uppermost Ir maximum in Section I, is within a gray sandstone containing visible clasts of white claystone, and the relatively high Ir levels probably reflect a reworked clast eroded from the underlying white claystone.

Supplemental Material Figure 4: Detail and added contextual information for Figure 2 of text showing position detail of boundary section in the Jacksonwald Syncline Composite section as well as correlation to two other Newark basin boundary sections, paleomagnetic polarity data, and footprint and pollen and spore assemblage distribution. Note that “new taxon B” is the term applied to an unnamed form by (8), and cly, md, and ss, refer to claystone, mudstone, and sandstone, respectively. Average Ir and pollen and spore percentages from Supplemental Material Figure 3. Interval of time represented by Jacksonwald syncline detailed section based on linear extrapolation from the average accumulation rate implied by the astronomical calibration of the Jacksonwald syncline composite section. Correlation throughout the Newark basin is based on the distinctive magnetic polarity and cycle stratigraphy and the basalts.

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15. We are especially grateful to the many amateur paleontologists who allowed us access to their collections, without which this paper would have been impossible. Most of the Late Triassic age footprint assemblages with quantitative data are in the private collections of M.J.S. and B.W.H. Most of the Clifton locality data are from the collections of Donald Carter, Fred Cassel, and Ken McKim.
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31. All analyses by XRF and INAA except as noted.
32. Common datum for averaging is the base of the "blue-gray sandstone" at 0 m. Averaging performed by interpolated Ir values to common depth scale, in 1 cm increments in columns and then averaging across equal depths in rows.
33. Material consisted of channel samples (i.e. contiguous, continuously sampled intervals) covering an average of 3 cm. Samples were manually crushed in plastic wrap, then mechanically in an alumina (ceramic) jaw crusher, and powdered using an automatic agate mill. Analyses for major and selected trace elements was done by standard X-ray fluorescence spectrometry (XRF) procedures (for information on standards, procedures, accuracy and precision, see W. U. Reimold, C. Koeberl, J. Bishop, *Geochim. Cosmochim. Acta*, **58**, 2689, 1994). The rest of the elements, except the ICS Ir (see ref. 36), were measured using instrumental neutron activation analysis (INAA). For details on the method, instrumentation, procedures, standards, data reduction, accuracy, precision, etc., see C. Koeberl, *J. Radioanalytic. Nuclear Chem.*, **168**, 47 (1993). Samples were irradiated at the TRIGA Mark II type reactor at the Atominstitut der Österreichischen Universitäten in Vienna for 7 hours at a flux of about $2 \times 10^{12} \text{ ncm}^{-2}\text{s}^{-1}$.
34. Section I, lat $40^{\circ}18'76''$, long $075^{\circ}50'56''$; Section II, lat $40^{\circ}18'76''$, long $075^{\circ}50'55''$; Section III, lat $40^{\circ}18'81''$, long $075^{\circ}50'38''$; Grist Mills, lat $40^{\circ}18'85''$, long $075^{\circ}51'20''$.
35. Ir content was measured with the ICS (iridium coincidence spectrometry) system at the Institute of Geochemistry at the University of Vienna. Crushed and powdered samples of about 50 mg each, as well as standards, were sealed into high purity quartz glass tubes, packed into aluminum foil and an aluminum capsule, and irradiated for 24 to 48 at a flux of about $7 \times 10^{13} \text{ ncm}^{-2}\text{s}^{-1}$. After a cooling period of about ten weeks, the samples were first measured for five to eight hours. The lines of ^{192}Ir at 316 and 468 keV were used, and the method requires that only coincident signals at both lines are used for further processing. Samples that yielded results close to the detection limit (ca. 5 ppt) were measured for at least another 24 hours. The precision of the Ir measurements follows a logarithmic error function with the lowest relative errors in the highest concentrations (e.g., 21 ± 9 ppt vs. 285 ± 33 ppt). For details on this method (standards, instrumentation, data reduction, precision, accuracy, etc.), see C. Koeberl, and H. Huber, *J. Radioanalytic. Nuclear Chem.*, **244**, 655. (2000).
36. INAA data for Ir have detection limits of 1 - 2 ppb and are hence not reliable.