

Online supplementary material to: Mokhatla MM, Rödder D, Measey GJ. Assessing the effects of climate change on distributions of Cape Floristic Region amphibians. S Afr J Sci. 2015;111(11/12), Art. #2014-0389, 7 pages. <http://dx.doi.org/10.17159/sajs.2015/20140389>

Supplementary table 1: Cape Floristic Region endemic amphibian species grouped according to Family, IUCN category, life-history trait and altitudinal specialisation

Species name	Family	IUCN category	Egg deposition and development groups	Altitude
<i>Afrixalus knysnae</i>	Hyperoliidae	Endangered	mode18	Lowland
<i>Amietia vandijki</i>	Pyxicephalidae	Data Deficient	mode1	Highland
<i>Amietophrynus pantherinus</i>	Bufoidea	Endangered	mode1	Lowland
<i>Amietophrynus pardalis</i>	Bufoidea	Least Concern	mode1	Lowland
<i>Arthroleptella bicolor</i>	Pyxicephalidae	Least Concern	mode17	Highland
<i>Arthroleptella drewesii</i>	Pyxicephalidae	Data Deficient	mode17	Highland
<i>Arthroleptella landdrosia</i>	Pyxicephalidae	Near Threatened	mode17	Highland
<i>Arthroleptella lightfooti</i>	Pyxicephalidae	Near Threatened	mode17	Lowland
<i>Arthroleptella rugosa</i>	Pyxicephalidae	Critically Endangered	mode17	Lowland
<i>Arthroleptella subvoce</i>	Pyxicephalidae	Endangered	mode17	Highland
<i>Arthroleptella villiersi</i>	Pyxicephalidae	Least Concern	mode17	Highland
<i>Breviceps acutirostris</i>	Brevipectidae	Least Concern	mode17	Highland
<i>Breviceps fuscus</i>	Brevipectidae	Least Concern	mode17	Lowland
<i>Breviceps gibbosus</i>	Brevipectidae	Vulnerable	mode17	Lowland
<i>Breviceps macrops</i>	Brevipectidae	Vulnerable	mode17	Lowland
<i>Breviceps montanus</i>	Brevipectidae	Least Concern	mode17	Lowland
<i>Breviceps namaquensis</i>	Brevipectidae	Least Concern	mode17	Lowland
<i>Cacosternum capense</i>	Pyxicephalidae	Vulnerable	mode1	Lowland
<i>Cacosternum karoicum</i>	Pyxicephalidae	Data Deficient	mode1	Highland
<i>Cacosternum namaquense</i>	Pyxicephalidae	Least Concern	mode1	Highland
<i>Cacosternum platys</i>	Pyxicephalidae	Least Concern	mode1	Lowland
<i>Capensibufo rosei</i>	Bufoidea	Vulnerable	mode1	Highland

Species name	Family	IUCN category	Egg deposition and development groups	Altitude
<i>Capensibufo tradouwi</i>	Bufonidae	Least Concern	mode1	Highland
<i>Heleophryne hewitti</i>	Heleophrynidae	Critically Endangered	mode2	Lowland
<i>Heleophryne orientalis</i>	Heleophrynidae	Least Concern	mode2	Lowland
<i>Heleophryne purcelli</i>	Heleophrynidae	Least Concern	mode2	Highland
<i>Heleophryne regis</i>	Heleophrynidae	Least Concern	mode2	Lowland
<i>Heleophryne rosei</i>	Heleophrynidae	Critically Endangered	mode2	Lowland
<i>Hyperolius horstockii</i>	Hyperoliidae	Vulnerable	mode18	Lowland
<i>Microbatrachella capensis</i>	Pyxicephalidae	Critically Endangered	mode1	Lowland
<i>Poyntonia paludicola</i>	Pyxicephalidae	Near Threatened	mode1	Highland
<i>Strongylopus bonaespei</i>	Pyxicephalidae	Least Concern	mode13	Highland
<i>Strongylopus springbokensis</i>	Pyxicephalidae	Vulnerable	mode13	Highland
<i>Tomopterna delalandii</i>	Pyxicephalidae	Least Concern	mode1	Lowland
<i>Vandijkophrynus angusticeps</i>	Bufonidae	Least Concern	mode1	Highland
<i>Vandijkophrynus robinsoni</i>	Bufonidae	Least Concern	mode1	Highland
<i>Xenopus gilli</i>	Pipidae	Endangered	mode1	Lowland

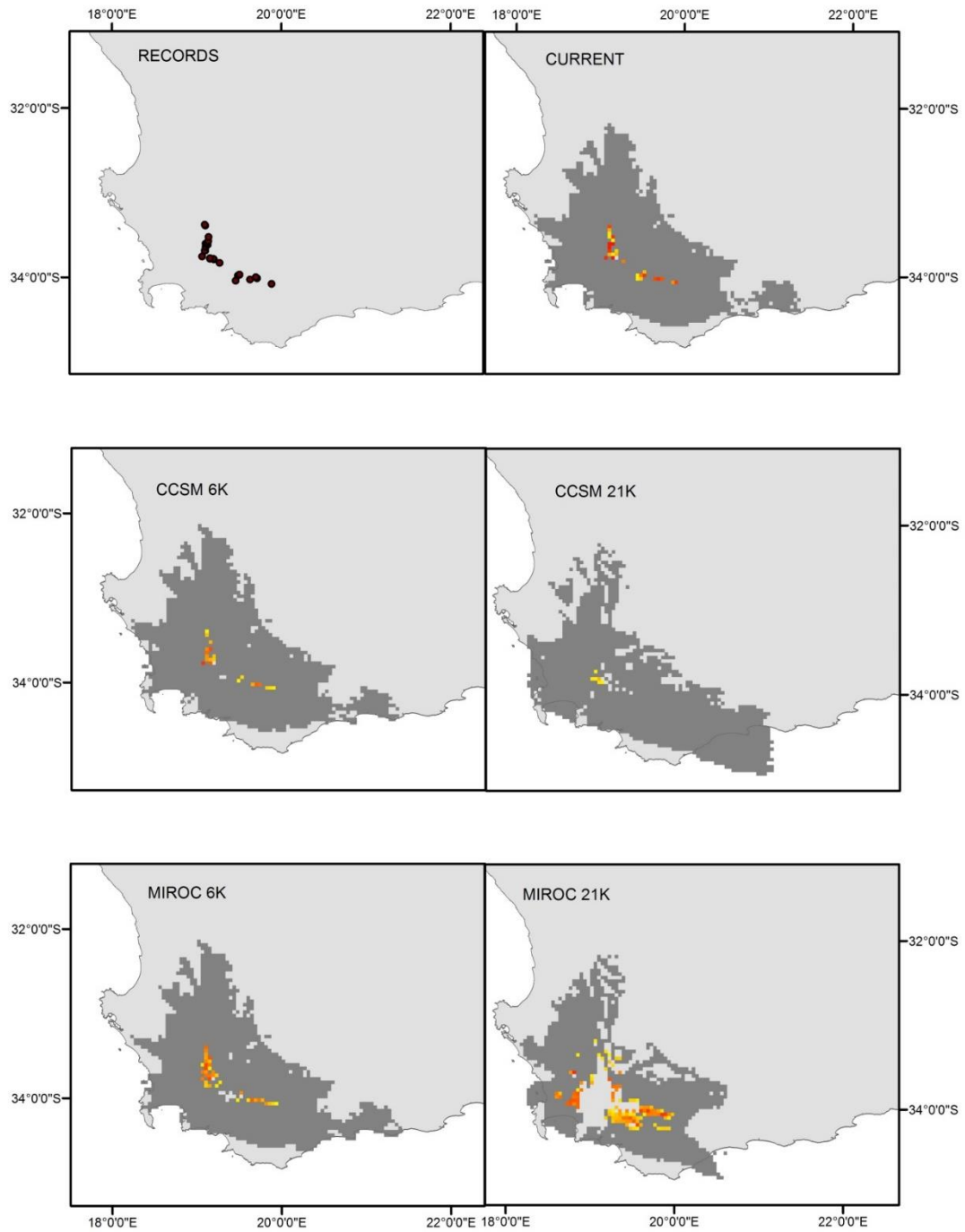
Supplementary table 2: Percentage contribution of final set of bioclimatic predictors used after determining the inter-correlation structure of 19 initial variables

Species	BIO10	BIO11	BIO13	BIO15	BIO17	BIO19	BIO3	BIO7	BIO8	BIO9
<i>Afrixalus knysnae</i>	7.743991	10.67119	14.3908	8.302279	11.936	13.72584	3.61571	14.46007	7.124749	8.029369
<i>Amietia vandijki</i>	17.39621	11.7875	9.669936	10.48824	13.11202	11.89466	6.872975	8.364904	4.991738	5.4218172
<i>Amietophrynus pantherinus</i>	7.805023	15.88895	12.91163	6.802673	7.670527	19.0036	2.600731	12.14429	6.162754	9.0098253
<i>Amietophrynus pardalis</i>	11.5093	10.8487	9.167925	12.87207	12.51675	11.91126	5.205984	7.003782	6.522108	12.442123
<i>Arthroleptella bicolor</i>	9.593349	15.68784	11.36405	9.505886	15.0933	10.08614	6.465105	8.637043	6.878256	6.6890372
<i>Arthroleptella drewesii</i>	12.54954	6.915392	14.26171	14.35277	12.08398	15.37238	5.216042	10.14865	2.822844	6.2766926
<i>Arthroleptella landdrosia</i>	11.23956	13.96334	8.472137	12.0075	12.90638	9.233001	6.649601	9.655311	9.536168	6.3369981
<i>Arthroleptella lightfooti</i>	9.159001	6.269758	8.414263	4.176516	12.66482	19.05989	6.229886	21.60311	3.212485	9.210264
<i>Arthroleptella rugosa</i>	8.219165	8.299981	11.63075	8.766596	9.186069	11.27862	13.807	13.14701	7.635174	8.0296325
<i>Arthroleptella subvoce</i>	6.85449	12.79548	10.68707	11.98805	15.05	12.49134	4.115075	10.07771	7.68573	8.2550437

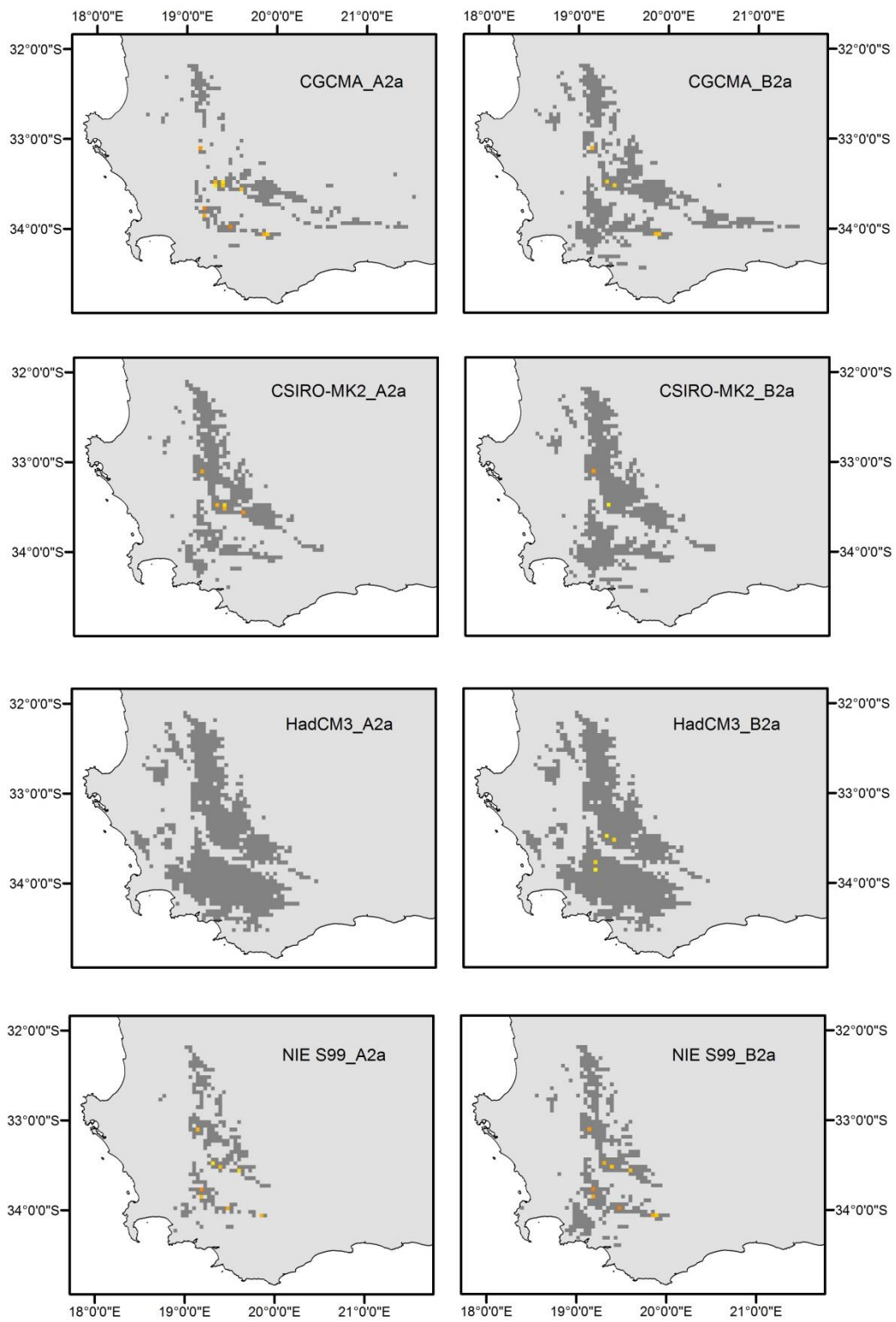
Species	BIO10	BIO11	BIO13	BIO15	BIO17	BIO19	BIO3	BIO7	BIO8	BIO9
<i>Arthroleptella villiersi</i>	8.581717	11.51247	8.470914	12.00443	13.35069	10.13629	9.807202	10.37784	6.00554	9.7529086
<i>Breviceps acutirostris</i>	17.12028	9.944252	9.098796	9.93576	12.96242	10.92705	4.649634	9.053386	6.970391	9.3380344
<i>Breviceps fuscus</i>	9.410888	10.00848	7.712176	9.319536	13.581	12.9834	9.492996	10.87741	6.937315	9.6767879
<i>Breviceps gibbosus</i>	11.99317	11.82804	15.90028	7.977323	7.941763	10.24663	4.697616	11.33469	7.905386	10.175103
<i>Breviceps macrops</i>	12.02958	10.37779	8.558153	10.38996	6.115747	8.767363	15.32464	12.31056	6.345635	9.7805727
<i>Breviceps montanus</i>	12.41313	10.94425	9.098796	9.93576	12.96242	12.92705	4.649634	10.05339	7.677591	9.3380344
<i>Breviceps namaquensis</i>	10.97418	10.54389	10.30435	7.621773	10.58291	13.60148	7.282522	8.984197	8.84221	11.262492
<i>Cacosternum capense</i>	10.92778	9.303938	14.2227	6.500397	10.58814	9.572234	8.317172	8.103138	8.874866	13.589638
<i>Cacosternum karoocicum</i>	9.841953	9.639938	10.74904	12.04431	13.36401	9.853836	7.262633	10.04859	9.221385	7.9743058
<i>Cacosternum namaquense</i>	8.452222	7.714444	14.75333	11.47667	9.856667	9.958889	7.681111	11.24	8.722222	10.144444
<i>Cacosternum platys</i>	16.11706	19.74557	6.099815	7.098588	9.11788	7.934264	5.981764	8.668976	10.17723	9.0588546
<i>Capensibufo rosei</i>	12.64284	8.556219	14.92428	8.332386	7.174805	9.265742	8.549163	13.73848	7.807888	9.0081968
<i>Capensibufo tradouwi</i>	10.94857	17.11476	7.518095	8.477619	10.68905	8.968571	11.44048	9.875714	7.72619	7.2409524
<i>Heleophryne hewitti</i>	12.82873	3.649309	7.024947	8.076017	11.98918	18.21056	6.112347	16.33957	7.221205	8.5481268
<i>Heleophryne orientalis</i>	14.59641	11.79025	10.08834	9.854428	11.28482	11.46847	5.655867	12.76073	6.335837	6.1648553
<i>Heleophryne purcelli</i>	12.61414	16.95195	8.33475	8.565762	8.216629	16.60586	4.725291	11.80778	6.054702	6.1231339
<i>Heleophryne regis</i>	8.30741	9.345133	10.25496	8.766069	14.25968	12.98771	8.529478	12.01885	6.835388	8.6953263
<i>Heleophryne rosei</i>	8.418422	10.64921	7.005147	3.950221	30.67999	15.13231	4.554256	7.542986	3.836034	8.2314197
<i>Hyperolius horstockii</i>	12.08828	11.51129	9.304369	8.985437	6.82694	6.540524	10.14148	18.52779	6.047944	10.025943
<i>Microbatrachella capensis</i>	8.626956	8.124454	13.81088	11.43938	8.258521	12.25669	14.65897	10.87431	5.976404	5.973425
<i>Poyntonia paludicola</i>	14.29412	10.64127	9.247158	10.00252	10.80411	12.75398	7.215347	10.03194	8.910974	6.0985859
<i>Strongylopus bonaespei</i>	9.218761	7.844743	15.25777	11.52598	11.61697	13.84634	5.846907	7.431223	9.536231	7.8750746
<i>Strongylopus springbokensis</i>	10.27146	8.848929	9.496718	9.104145	6.991789	13.24869	11.20913	10.40406	11.09214	9.3329289
<i>Tomopterna delalandii</i>	8.912257	6.837648	6.452227	6.318995	10.59669	31.56643	3.149981	13.52303	5.186525	7.4562238
<i>Vandijkophrynus angusticeps</i>	7.456201	5.850223	10.73342	9.747509	16.74682	18.55204	5.853659	13.52113	5.314325	6.2246651
<i>Vandijkophrynus robinsoni</i>	9.739188	7.401116	9.353274	7.739896	10.43933	9.250167	12.17644	13.50308	12.3748	8.0227032
<i>Xenopus gilli</i>	7.526525	12.74192	10.71201	9.417674	10.37676	15.22866	7.530209	12.87332	5.147853	8.445083

Supplementary table 3: Ensemble model accuracy score

	Kappa	TSS	ROC
<i>Afrivalus knysnae</i>	0.669	0.975	1
<i>Amietia vandijki</i>	0.556	0.969	0.999
<i>Amietophrynus pantherinus</i>	0.946	0.955	0.998
<i>Amietophrynus pardalis</i>	0.52	0.817	0.966
<i>Arthroleptella bicolor</i>	0.679	0.976	1
<i>Arthroleptella drewesii</i>	1	1	1
<i>Arthroleptella landdrosia</i>	0.972	0.976	0.999
<i>Arthroleptella lightfooti</i>	0.974	0.959	0.998
<i>Arthroleptella rugosa</i>	0.454	0.964	1
<i>Arthroleptella subvoce</i>	0.352	0.96	1
<i>Arthroleptella villiersi</i>	0.84	0.919	0.992
<i>Breviceps acutirostris</i>	0.686	0.947	0.995
<i>Breviceps fuscus</i>	0.553	0.897	0.986
<i>Breviceps gibbosus</i>	0.636	0.924	0.992
<i>Breviceps macrops</i>	0.637	0.973	0.998
<i>Breviceps montanus</i>	0.723	0.978	0.998
<i>Breviceps namaquensis</i>	0.353	0.872	0.964
<i>Cacosternum capense</i>	0.505	0.8	0.954
<i>Cacosternum karoicum</i>	0.306	0.959	0.997
<i>Cacosternum namaquense</i>	0.392	0.715	0.928
<i>Cacosternum platys</i>	0.289	0.957	1
<i>Capensibufo rosei</i>	0.654	0.952	0.995
<i>Capensibufo tradouwi</i>	0.519	0.917	0.99
<i>Heleophryne hewitti</i>	0.987	0.989	1
<i>Heleophryne orientalis</i>	0.647	0.971	0.997
<i>Heleophryne purcelli</i>	0.695	0.809	0.967
<i>Heleophryne regis</i>	0.848	0.898	0.989
<i>Heleophryne rosei</i>	1	1	1
<i>Hyperolius horstockii</i>	0.648	0.806	0.968
<i>Microbatrachella capensis</i>	0.967	0.992	1
<i>Poyntonina paludicola</i>	0.877	0.982	0.998
<i>Strongylopus bonaespei</i>	0.581	0.808	0.957
<i>Strongylopus springbokensis</i>	0.459	0.966	0.995
<i>Tomopterna delalandii</i>	0.471	0.566	0.854
<i>Vandijkophrynus angusticeps</i>	0.48	0.686	0.918
<i>Vandijkophrynus robinsoni</i>	0.404	0.777	0.95
<i>Xenopus gilli</i>	0.641	0.974	0.999



Supplementary figure 1: Distribution records, current (6 kya) and palaeoclimate (21 kya) projections for *Arthroleptella bicolor* projected using two different general circulation models (CCSM and MIROC).



Supplementary figure 2: Future (2080) climate projections for *Arthroleptella bicolor* projected using four different general circulation models (CGCMA2, CSIRO-MK2, HadCM3 and NIE S99) and two Intergovernmental Panel on Climate Change emission scenarios (A2a and B2a).