SPARQL queries generated for the STBioData system. These queries were used for the Project: Using a Provenance Model and Spatiotemporal Information to Integrate Heterogeneous Biodiversity Semantic Data.

1. Find Reithrodon typicus occurrences of species within Pampa Biome between 2005 and 2010

PREFIX bioprov: <http://java.icmc.usp.br/bioprov/>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX geo: <http://www.opengis.net/ont/geosparql#>
PREFIX geof: <http://www.opengis.net/def/function/geosparql/>
PREFIX prov: <http://www.w3.org/ns/prov#>
PREFIX dwc: <http://rs.tdwg.org/dwc/terms/>
PREFIX ogc: <http://www.opengis.net/ont/geosparql#>
PREFIX uom: <http://www.opengis.net/def/uom/OGC/1.0/>
PREFIX foaf: <http://xmlns.com/foaf/0.1/>
SELECT ?CodSpecie ?scientificname ?pontowkt ?dateCollected
WHERE {
?CodSpecie geo:hasGeometry/geo:asWKT ?pontowkt .
?CodSpecie dwc:scientificName ?scientificname.
?CodSpecie prov:hadMember/bioprov:wasCollectedBy/prov:startedAtTime ?dateCollected.
FILTER (?scientificname = "Reithrodon typicus").
FILTER (geof:sfWithin(?pontowkt, "Polygon((-27.9438669010023 -55.5745701702228, -30.2972789744283 -57.6758585048672, -30.5494356962113 -56.4361061366932, -31.2428560773902 -55.8477519083719, -32.8188162630597 -53.2842006474188, -33.8904608768471 -53.683449586842, -33.0289472564115 -52.1705238872333, -29.2046484872924 -49.5018807919052, -27.9438669010023 -55.5745701702228))"^^ogc:wktLiteral))
} order by ?scientificname

2. Find all the occurrences of species intersects Pampa Biome and Atlantic Forest between 1950 and 2016
Phyllomys dasythrix
PREFIX bioprov: <http://java.icmc.usp.br/bioprov/>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX geo: <http://www.opengis.net/ont/geosparql#>
PREFIX geof: <http://www.opengis.net/def/function/geosparql/>
PREFIX prov: <http://www.w3.org/ns/prov#>
PREFIX dwc: <http://rs.tdwg.org/dwc/terms/>
PREFIX ogc: <http://www.opengis.net/ont/geosparql#>
PREFIX uom: <http://www.opengis.net/def/uom/OGC/1.0/>
PREFIX foaf: <http://xmlns.com/foaf/0.1/>
SELECT ?CodSpecie ?scientificname ?pontowkt ?dateCollected
WHERE {
?CodSpecie geo:hasGeometry/geo:asWKT ?pontowkt .
?CodSpecie dwc:scientificName ?scientificname.
?CodSpecie prov:hadMember/bioprov:wasCollectedBy/prov:startedAtTime ?dateCollected.
FILTER (geof:sfIntersects(?pontowkt, "Polygon((-27.9438669010023 -55.5745701702228, -30.2972789744283 -57.6758585048672, -30.5494356962113 -56.4361061366932, -31.2428560773902 -55.8477519083719, -32.8188162630597 -53.2842006474188, -33.8904608768471 -53.683449586842, -33.0289472564115 -52.1705238872333, -

29.2046484872924 -49.5018807919052, -27.9438669010023 -
55.5745701702228))"^^ogc:wktLiteral))
   FILTER (geof:sfIntersects(?pontowkt, "Polygon((-4.89075599769349 -
36.0543288853819, -23.2874195948358 -57.7625109158595, -31.3819547280339 -
54.5431181892287, -26.1389521230818 -39.9176816684723, -5.35067549011898 -
33.9387020671285, -4.89075599769349 -36.0543288853819))"^^ogc:wktLiteral))
} order by ?scientificname

**3. Find Bacopa monnierioides occurrences of species within Pantanal Biome and Cerrado
Biome between 1980 and 2000**

PREFIX bioprov: <http://java.icmc.usp.br/bioprov/>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX geo: <http://www.opengis.net/ont/geosparql#>
PREFIX geof: <http://www.opengis.net/def/function/geosparql/>
PREFIX prov: <http://www.w3.org/ns/prov#>
PREFIX dwc: <http://rs.tdwg.org/dwc/terms/>
PREFIX ogc: <http://www.opengis.net/ont/geosparql#>
PREFIX uom: <http://www.opengis.net/def/uom/OGC/1.0/>
PREFIX foaf: <http://xmlns.com/foaf/0.1/>
SELECT ?CodSpecie ?scientificname ?pontowkt ?dateCollected
WHERE {
?CodSpecie geo:hasGeometry/geo:asWKT ?pontowkt .
?CodSpecie dwc:scientificName ?scientificname.
?CodSpecie prov:hadMember/bioprov:wasCollectedBy/prov:startedAtTime ?dateCollected.
FILTER (?scientificname = "Bacopa monnierioides").
   FILTER (geof:sfWithin(?pontowkt, "Polygon((-15.3040028213148 -59.3549951567885,-
15.7444231432591 -54.3147335282668, -21.2006133574037 -55.6359816854109, -
22.2771644889397 -57.9848457675719, -15.3040028213148 -
59.3549951567885))"^^ogc:wktLiteral))
   FILTER (geof:sfWithin(?pontowkt, "Polygon((-1.78245627439619 -43.7797486666813, -
5.41044655025951 -48.8919241365655, -12.7488716512682 -53.3444687732311, -
10.7699601778881 -60.682900264666, -18.0259267186175 -58.7864660962642, -
24.1275306005828 -57.7145787023755, -22.3960117465476 -51.8603123351715, -
25.4468184394088 -50.1287796173756, -18.4382338087296 -41.7184051955491, -
12.7488887934788 -41.3885777268875, -2.35963777005602 -41.2236607494585, -
1.78245627439619 -43.7797486666813))"^^ogc:wktLiteral))

} order by ?scientificname

**4. Find all the occurrences of species intersects Caatinga and Atlantic Forest between 1980
and 1985**

PREFIX bioprov: <http://java.icmc.usp.br/bioprov/>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX geo: <http://www.opengis.net/ont/geosparql#>
PREFIX geof: <http://www.opengis.net/def/function/geosparql/>
PREFIX prov: <http://www.w3.org/ns/prov#>
PREFIX dwc: <http://rs.tdwg.org/dwc/terms/>
PREFIX ogc: <http://www.opengis.net/ont/geosparql#>
PREFIX uom: <http://www.opengis.net/def/uom/OGC/1.0/>
PREFIX foaf: <http://xmlns.com/foaf/0.1/>
SELECT ?CodSpecie ?scientificname ?pontowkt ?dateCollected
WHERE {

?CodSpecie geo:hasGeometry/geo:asWKT ?pontowkt .
?CodSpecie dwc:scientificName ?scientificname.
?CodSpecie prov:hadMember/bioprov:wasCollectedBy/prov:startedAtTime ?dateCollected.
FILTER (?scientificname = "Eugenia punicifolia").
   #Caatinga
   FILTER (geof:sfIntersects(?pontowkt, "Polygon((-2.34926294313179 -42.1383883080881,
-6.4820615605329 -44.4015916150107, -16.617249752875 -44.6476047821241, -
12.7796663487531 -36.283589644394, -5.05526693050875 -34.5615809528797, -
2.59526354099341 -40.1211867181028, -2.34926294313179 -
42.1383883080881))"^^ogc:wktLiteral))

#atlantic
   FILTER (geof:sfIntersects(?pontowkt, "Polygon((-4.89075599769349 -
36.0543288853819, -23.2874195948358 -57.7625109158595, -31.3819547280339 -
54.5431181892287, -26.1389521230818 -39.9176816684723, -5.35067549011898 -
33.9387020671285, -4.89075599769349 -36.0543288853819))"^^ogc:wktLiteral))
} order by ?scientificname

5. Find Tapirus terrestris occurrences of species within Mapinguari National Park
between 2013 and 2016

PREFIX bioprov: <http://java.icmc.usp.br/bioprov/>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX geo: <http://www.opengis.net/ont/geosparql#>
PREFIX geof: <http://www.opengis.net/def/function/geosparql/>
PREFIX prov: <http://www.w3.org/ns/prov#>
PREFIX dwc: <http://rs.tdwg.org/dwc/terms/>
PREFIX ogc: <http://www.opengis.net/ont/geosparql#>
PREFIX uom: <http://www.opengis.net/def/uom/OGC/1.0/>
PREFIX foaf: <http://xmlns.com/foaf/0.1/>
SELECT ?CodSpecie ?scientificname ?pontowkt ?dateCollected
WHERE {
?CodSpecie geo:hasGeometry/geo:asWKT ?pontowkt .
?CodSpecie dwc:scientificName ?scientificname.
?CodSpecie prov:hadMember/bioprov:wasCollectedBy/prov:startedAtTime ?dateCollected.
FILTER (?scientificname = "Tapirus terrestris").
   FILTER (geof:sfWithin(?pontowkt, "Polygon((-7.58139395901241 -64.4932068242082,-
7.7163645154731 -64.5067038798542, -7.79734684934951 -64.524699954049,-
7.85133507193378 -64.565191120987,-8.01329973968661 -64.6641695290584, -
8.30573594535143 -64.655171491961,-8.51269079859115 -64.5921852322793,-
8.52618785423722 -64.5516940653411,-8.64766135505183 -64.6596705105097,-
8.4452055203608 -64.8081381226164,-8.41821140906867 -64.8756234008468,-
8.51269079859115 -64.8891204564928,-8.56218000262673 -65.190554699255,-
8.74214074457431 -65.4829909049199,-9.05707204298258 -65.6719496839648,-
9.19204259944327 -65.3255252557157,-9.31351610025789 -65.4469987565303,-
9.4799797865594 -65.451497775079,-9.59695426882533 -65.4110066081408,-
9.54296604624105 -65.1635605879629,-9.59245525027664 -65.0780792355378,-
9.51147291640023 -64.8306332153599,-9.16504848815113 -64.6101813064741,-
8.96709167200879 -64.524699954049,-8.85461620829155 -64.2862519709684,-
8.76913485586645 -64.2547588411276,-8.52168883568853 -64.191772581446,-
8.24274968566978 -64.0927941733748,-8.08528403646564 -64.1017922104722,-
7.87832918322592 -63.7148766152849,-7.90082427596937 -63.6248962443111,-
7.66237629288882 -63.5754070402755, -7.60388905175586 -63.5754070402755,-

7.54090279207421 -63.7148766152849,-7.51390868078207 -64.3672343048448,-
7.58139395901241 -64.4932068242082))"^^ogc:wktLiteral))

} order by ?scientificname

6. Find all the occurrences of species intersects Jaú National Park between 2007 and 2012

PREFIX bioprov: <http://java.icmc.usp.br/bioprov/>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX geo: <http://www.opengis.net/ont/geosparql#>
PREFIX geof: <http://www.opengis.net/def/function/geosparql/>
PREFIX prov: <http://www.w3.org/ns/prov#>
PREFIX dwc: <http://rs.tdwg.org/dwc/terms/>
PREFIX ogc: <http://www.opengis.net/ont/geosparql#>
PREFIX uom: <http://www.opengis.net/def/uom/OGC/1.0/>
PREFIX foaf: <http://xmlns.com/foaf/0.1/>
SELECT ?CodSpecie ?scientificname ?pontowkt ?dateCollected
WHERE {
?CodSpecie geo:hasGeometry/geo:asWKT ?pontowkt .
?CodSpecie dwc:scientificName ?scientificname.
?CodSpecie prov:hadMember/bioprov:wasCollectedBy/prov:startedAtTime ?dateCollected.

  #Jaú National Park
  FILTER (geof:sfIntersects(?pontowkt, "Polygon((-1.98455254212069 -63.4361231313596,
-2.12625175287864 -63.5999628437985, -2.22366996027473 -63.6132471448071, -
2.25023856229185 -63.7505182552288, -2.31223196699845 -63.7903711582545, -
2.40522207405836 -63.7416620545565, -2.44507497708403 -63.9276422686763, -
2.56463368616105 -63.9896356733829, -2.56020558582487 -63.7903711582545, -
2.78161060263416 -63.7239496532117, -2.83031970633221 -63.6619562485051, -
2.7373295992723 -63.5025446364024, -2.70190479658282 -63.3519892249721, -
2.77718250229798 -63.2457148169036, -2.84803210767695 -63.1970057132056, -
2.82589160599602 -62.9888849974049, -2.94987841540923 -62.873754388664, -
2.98087511776253 -62.825045284966, -2.88788501070263 -62.6434931711824, -
2.72404529826375 -62.4353724553816, -2.52478078313538 -62.0811244284867, -
2.48492788010971 -61.9172847160479, -2.40079397372217 -61.8995723147031, -
2.39636587338599 -61.7667293046175, -2.27680716430897 -61.7268764015919, -
2.26352286330041 -61.5896052911701, -2.21481375960236 -61.5674647894892, -
2.0775426491806 -61.5807490904977, -1.95355583976739 -61.5276118864635, -
1.93584343842265 -61.4523341807483, -1.8871343347246 -61.3682002743608, -
1.77643182631995 -61.3947688763779, -1.63030451522582 -61.4124812777227, -
1.56831111051921 -61.4833308831016, -1.5417425085021 -61.5231837861273, -
1.65687311724293 -61.5187556857911, -1.634732615562 -61.611745792851, -
1.6657293179153 -61.780013605626, -1.74100702363047 -61.9704219200821, -
1.72329462228572 -62.0722682278144, -1.75871942497521 -62.2405360405894, -
1.825140930018 -62.3910914520198, -1.81185662900944 -62.4398005557178, -
1.86499383304367 -62.5106501610968, -1.81185662900944 -62.5549311644586, -
1.73657892329428 -62.6479212715185, -1.70115412060479 -62.7674799805955, -
1.71443842161335 -62.8693262883278, -1.80742852867325 -63.015453599422, -
1.89156243506079 -63.2634272182484, -1.98455254212069 -
63.4361231313596))"^^ogc:wktLiteral))

} order by ?scientificname

7. Find Inia geoffrensis occurrences of species within Amazon Forest

PREFIX bioprov: <http://java.icmc.usp.br/bioprov/>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX geo: <http://www.opengis.net/ont/geosparql#>
PREFIX geof: <http://www.opengis.net/def/function/geosparql/>
PREFIX prov: <http://www.w3.org/ns/prov#>
PREFIX dwc: <http://rs.tdwg.org/dwc/terms/>
PREFIX ogc: <http://www.opengis.net/ont/geosparql#>
PREFIX uom: <http://www.opengis.net/def/uom/OGC/1.0/>
PREFIX foaf: <http://xmlns.com/foaf/0.1/>
SELECT ?CodSpecie ?scientificname ?pontowkt ?dateCollected
WHERE {
?CodSpecie geo:hasGeometry/geo:asWKT ?pontowkt .
?CodSpecie dwc:scientificName ?scientificname.
?CodSpecie prov:hadMember/bioprov:wasCollectedBy/prov:startedAtTime ?dateCollected.
FILTER (?scientificname = "Inia geoffrensis").
   FILTER (geof:sfWithin(?pontowkt, "Polygon((-1 -58, -7 -58, -7 -69, -1 -69, -1 -
58))"^^ogc:wktLiteral))
} order by ?scientificname

8. Find Cardiospermum anomalum occurrences of species intersects Cerrado and Caatinga
between 1980 and 1985

PREFIX bioprov: <http://java.icmc.usp.br/bioprov/>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX geo: <http://www.opengis.net/ont/geosparql#>
PREFIX geof: <http://www.opengis.net/def/function/geosparql/>
PREFIX prov: <http://www.w3.org/ns/prov#>
PREFIX dwc: <http://rs.tdwg.org/dwc/terms/>
PREFIX ogc: <http://www.opengis.net/ont/geosparql#>
PREFIX uom: <http://www.opengis.net/def/uom/OGC/1.0/>
PREFIX foaf: <http://xmlns.com/foaf/0.1/>
SELECT ?CodSpecie ?scientificname ?pontowkt ?dateCollected
WHERE {
?CodSpecie geo:hasGeometry/geo:asWKT ?pontowkt .
?CodSpecie dwc:scientificName ?scientificname.
?CodSpecie prov:hadMember/bioprov:wasCollectedBy/prov:startedAtTime ?dateCollected.
FILTER (?scientificname = "Cardiospermum anomalum").
   FILTER (geof:sfIntersects(?pontowkt, "Polygon((-2.34926294313179 -42.1383883080881,
-6.4820615605329 -44.4015916150107, -16.617249752875 -44.6476047821241, -
12.7796663487531 -36.283589644394, -5.05526693050875 -34.5615809528797, -
2.59526354099341 -40.1211867181028, -2.34926294313179 -
42.1383883080881))"^^ogc:wktLiteral))

   FILTER (geof:sfIntersects(?pontowkt, "Polygon((-1.78245627439619 -43.7797486666813,
-5.41044655025951 -48.8919241365655, -12.7488716512682 -53.3444687732311, -
10.7699601778881 -60.682900264666, -18.0259267186175 -58.7864660962642, -
24.1275306005828 -57.7145787023755, -22.3960117465476 -51.8603123351715, -
25.4468184394088 -50.1287796173756, -18.4382338087296 -41.7184051955491, -
12.7488887934788 -41.3885777268875, -2.35963777005602 -41.2236607494585, -
1.78245627439619 -43.7797486666813))"^^ogc:wktLiteral))

} order by ?scientificname

9. Find Akodon montensis occurrences of species within Atlantic Forest between 2000 and 2010

PREFIX bioprov: <http://java.icmc.usp.br/bioprov/>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX geo: <http://www.opengis.net/ont/geosparql#>
PREFIX geof: <http://www.opengis.net/def/function/geosparql/>
PREFIX prov: <http://www.w3.org/ns/prov#>
PREFIX dwc: <http://rs.tdwg.org/dwc/terms/>
PREFIX ogc: <http://www.opengis.net/ont/geosparql#>
PREFIX uom: <http://www.opengis.net/def/uom/OGC/1.0/>
PREFIX foaf: <http://xmlns.com/foaf/0.1/>
SELECT ?CodSpecie ?scientificname ?pontowkt ?dateCollected
WHERE {
?CodSpecie geo:hasGeometry/geo:asWKT ?pontowkt .
?CodSpecie dwc:scientificName ?scientificname.
?CodSpecie prov:hadMember/bioprov:wasCollectedBy/prov:startedAtTime ?dateCollected.
FILTER (?scientificname = "Akodon montensis").
   FILTER (geof:sfWithin(?pontowkt, "Polygon((-4.89075599769349 -36.0543288853819, -23.2874195948358 -57.7625109158595, -31.3819547280339 -54.5431181892287, -26.1389521230818 -39.9176816684723, -5.35067549011898 -33.9387020671285, -4.89075599769349 -36.0543288853819))"^^ogc:wktLiteral))
} order by ?scientificname

10. Find all occurrences of species within Amazon Forest
PREFIX bioprov: <http://java.icmc.usp.br/bioprov/>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX geo: <http://www.opengis.net/ont/geosparql#>
PREFIX geof: <http://www.opengis.net/def/function/geosparql/>
PREFIX prov: <http://www.w3.org/ns/prov#>
PREFIX dwc: <http://rs.tdwg.org/dwc/terms/>
PREFIX ogc: <http://www.opengis.net/ont/geosparql#>
PREFIX uom: <http://www.opengis.net/def/uom/OGC/1.0/>
PREFIX foaf: <http://xmlns.com/foaf/0.1/>
SELECT ?CodSpecie ?scientificname ?pontowkt ?dateCollected
WHERE {
?CodSpecie geo:hasGeometry/geo:asWKT ?pontowkt .
?CodSpecie dwc:scientificName ?scientificname.
?CodSpecie prov:hadMember/bioprov:wasCollectedBy/prov:startedAtTime ?dateCollected.
FILTER (?scientificname = "Tapirus terrestris").
   FILTER (geof:sfWithin(?pontowkt, "Polygon((-7.58139395901241 -64.4932068242082,-7.7163645154731 -64.5067038798542, -7.79734684934951 -64.524699954049,-7.85133507193378 -64.565191120987,-8.01329973968661 -64.6641695290584, -8.30573594535143 -64.655171491961,-8.51269079859115 -64.5921852322793,-8.52618785423722 -64.5516940653411,-8.64766135505183 -64.6596705105097,-8.4452055203608 -64.8081381226164,-8.41821140906867 -64.8756234008468,-8.51269079859115 -64.8891204564928,-8.56218000262673 -65.190554699255,-8.74214074457431 -65.4829909049199,-9.05707204298258 -65.6719496839648,-9.19204259944327 -65.3255252557157,-9.31351610025789 -65.4469987565303,-9.4799797865594 -65.451497775079,-9.59695426882533 -65.4110066081408,-

9.54296604624105 -65.1635605879629,-9.59245525027664 -65.0780792355378,-9.51147291640023 -64.8306332153599,-9.16504848815113 -64.6101813064741,-8.96709167200879 -64.524699954049,-8.85461620829155 -64.2862519709684,-8.76913485586645 -64.2547588411276,-8.52168883568853 -64.191772581446,-8.24274968566978 -64.0927941733748,-8.08528403646564 -64.1017922104722,-7.87832918322592 -63.7148766152849,-7.90082427596937 -63.6248962443111,-7.66237629288882 -63.5754070402755, -7.60388905175586 -63.5754070402755,-7.54090279207421 -63.7148766152849,-7.51390868078207 -64.3672343048448,-7.58139395901241 -64.4932068242082))"^^ogc:wktLiteral))