



Ecogrid

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<http://seek.ecoinformatics.org/Wiki.jsp?page=EcoGrid>





EcoGrid Focus

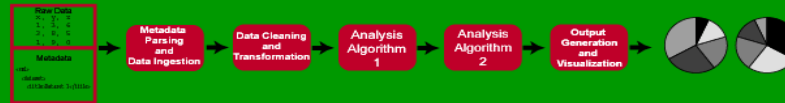
- Data and Metadata
 - Distributed Data
 - XML-based Metadata
- Service to Semantic Mediation Layer
 - Access to Ontologies and Taxon Services
 - Helping with Semantic Data Integration
- Service to Analysis and Modelling Layer
 - Interaction with Kepler - Workflows
 - Interaction with Grid Computing Facilities
- Access to Legacy Apps
 - LifeMapper
 - Spatial Data Workbench





System Overview

Analysis and Modeling System (Kepler)



Semantic Mediation System



EcoGrid

Data/Metadata Repository

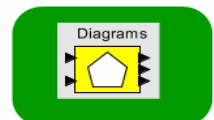
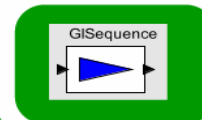
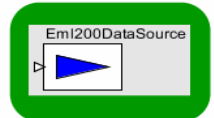
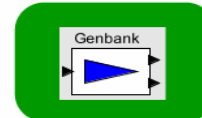
Raw Data x, y, z 1, 3, 6 3, 8, 5 1, 9, 0	Metadata <eml> <dataset> <title>Dataset 1</title> ...
--	---

Raw Data a, b, c, d 1, 3, 6, 4 3, 8, 5, 1 1, 9, 0, 1	Metadata <eml> <dataset> <title>Dataset 2</title> ...
--	---

Raw Data m, n, o 1, 3, 6 3, 8, 5 1, 9, 0	Metadata <eml> <dataset> <title>Dataset 3</title> ...
--	---

Raw Data p, q 1, 3 3, 8 1, 9	Metadata <eml> <dataset> <title>Dataset 4</title> ...
--	---

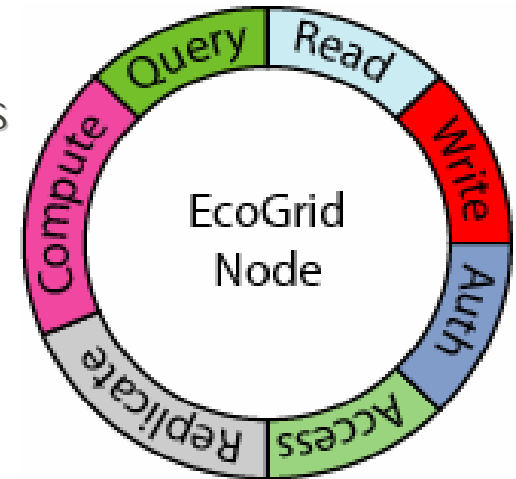
Analysis Library





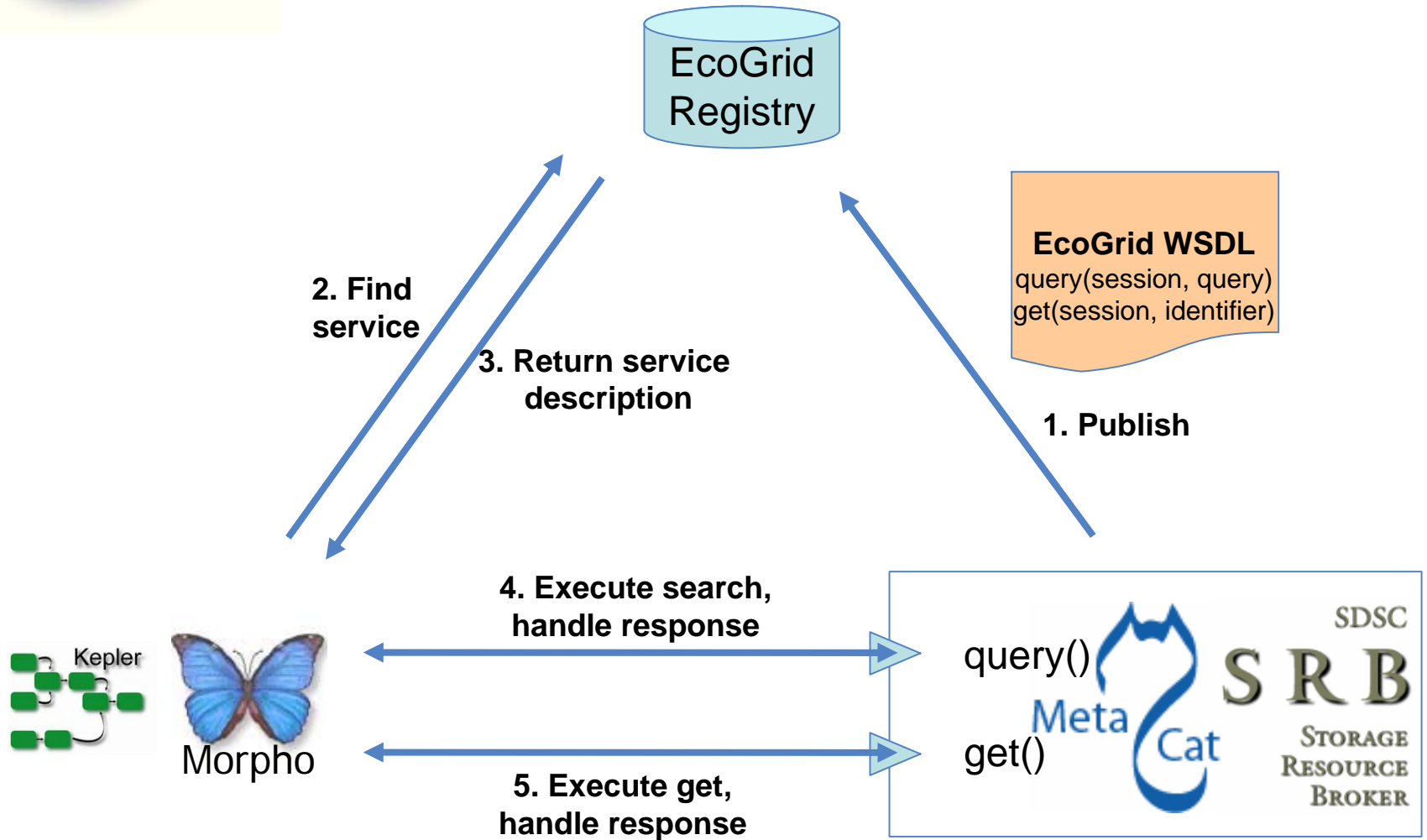
SEEK EcoGrid

- Goal: allow diverse environmental data systems to interoperate
 - Hides complexity of underlying systems using lightweight interfaces
 - Integrate diverse data networks from ecology, biodiversity, and environmental sciences
- Data systems
 - Any system can implement these interfaces
 - Prototyping using:
 - Metacat, SRB, DiGIR, Xanthoria, etc.
- Supports multiple metadata standards
 - EML, Darwin Core as foci



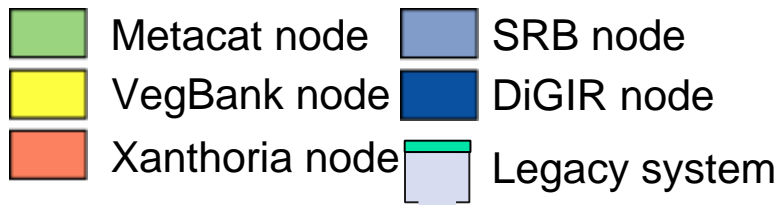
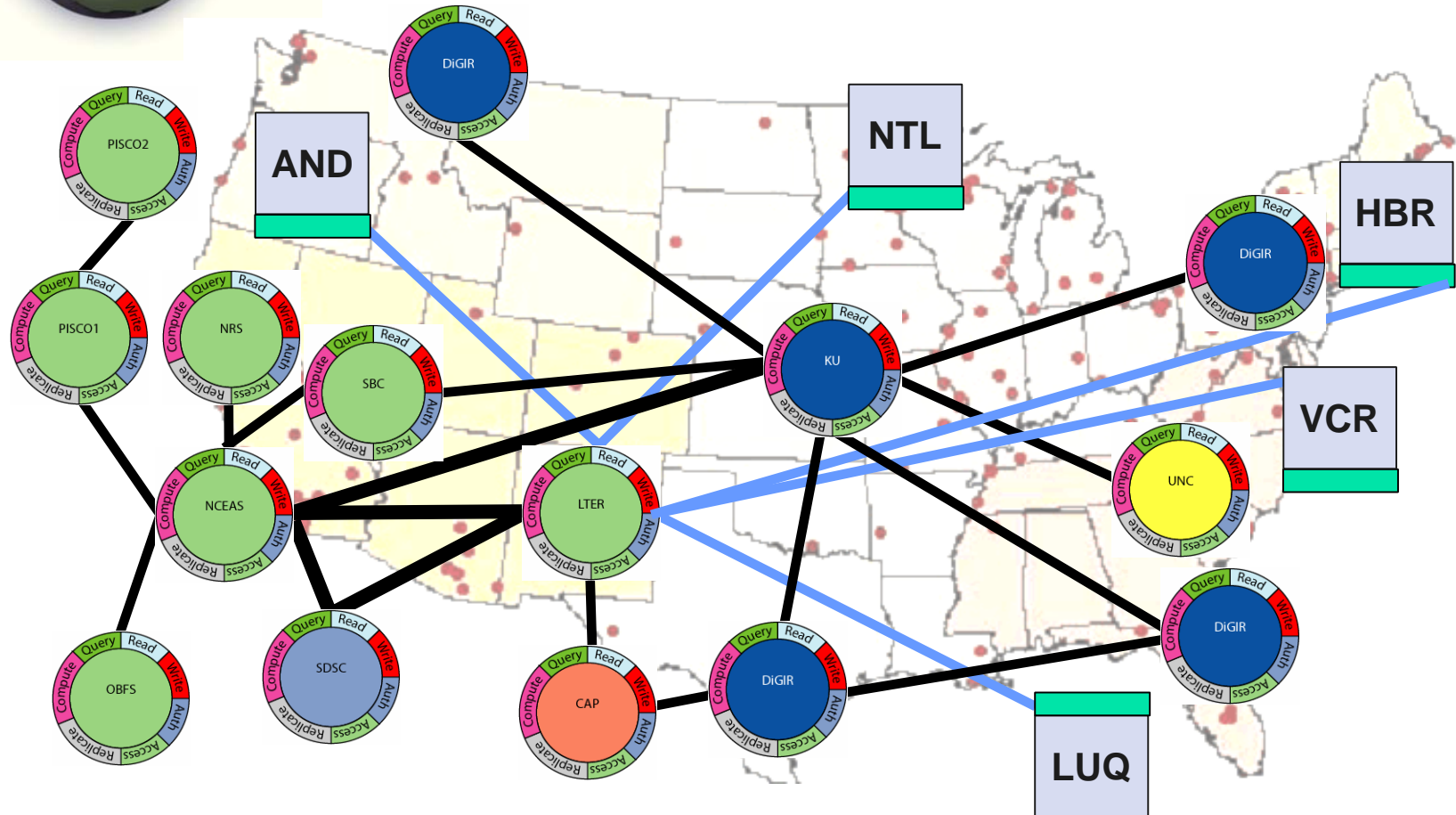


EcoGrid Example





Building the EcoGrid

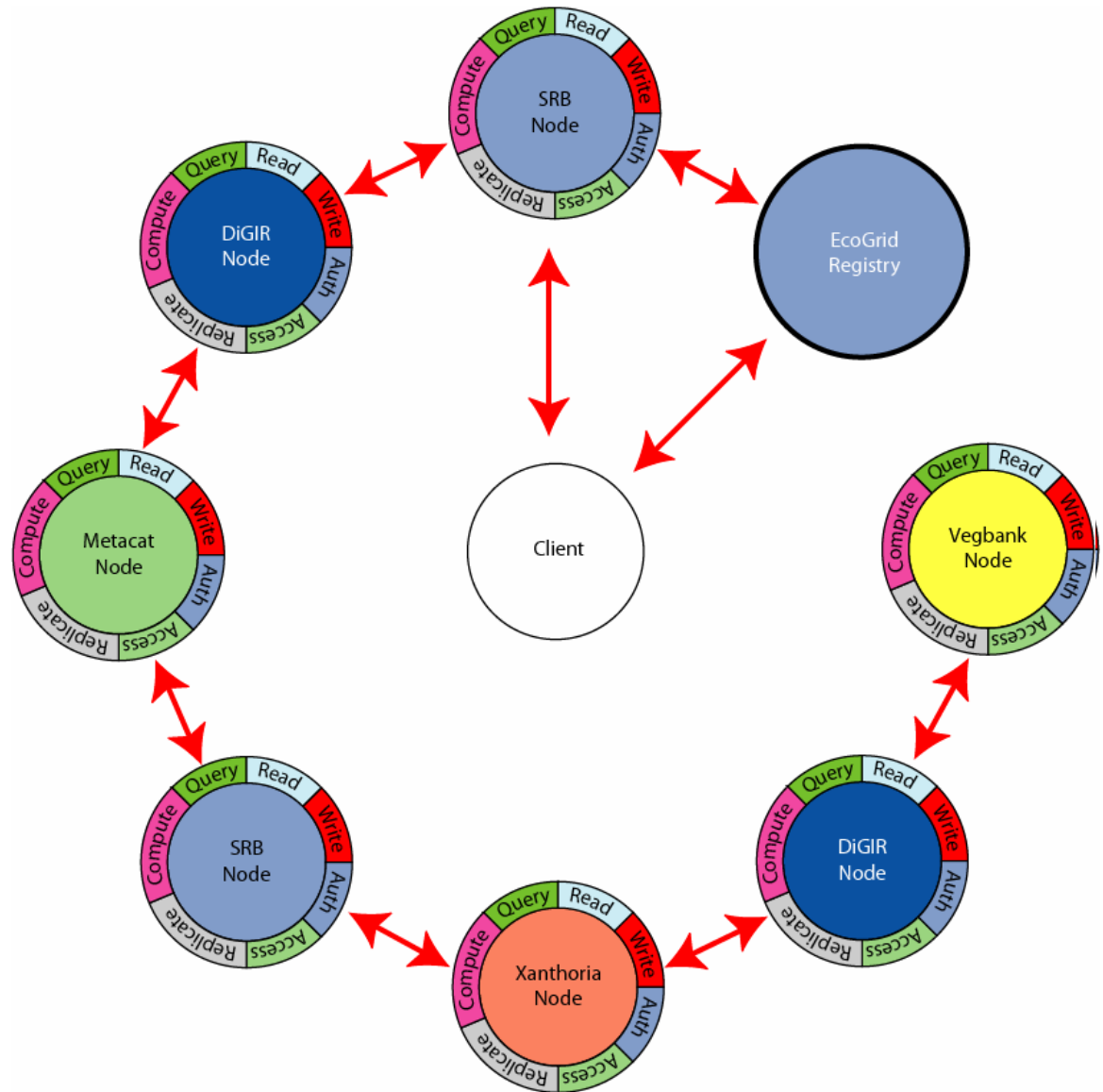


LTER Network (24) Natural History Collections (>> 100)
 Organization of Biological Field Stations (180)
 UC Natural Reserve System (36)
 Partnership for Interdisciplinary Studies of Coastal Oceans (4)
 Multi-agency Rocky Intertidal Network (60)



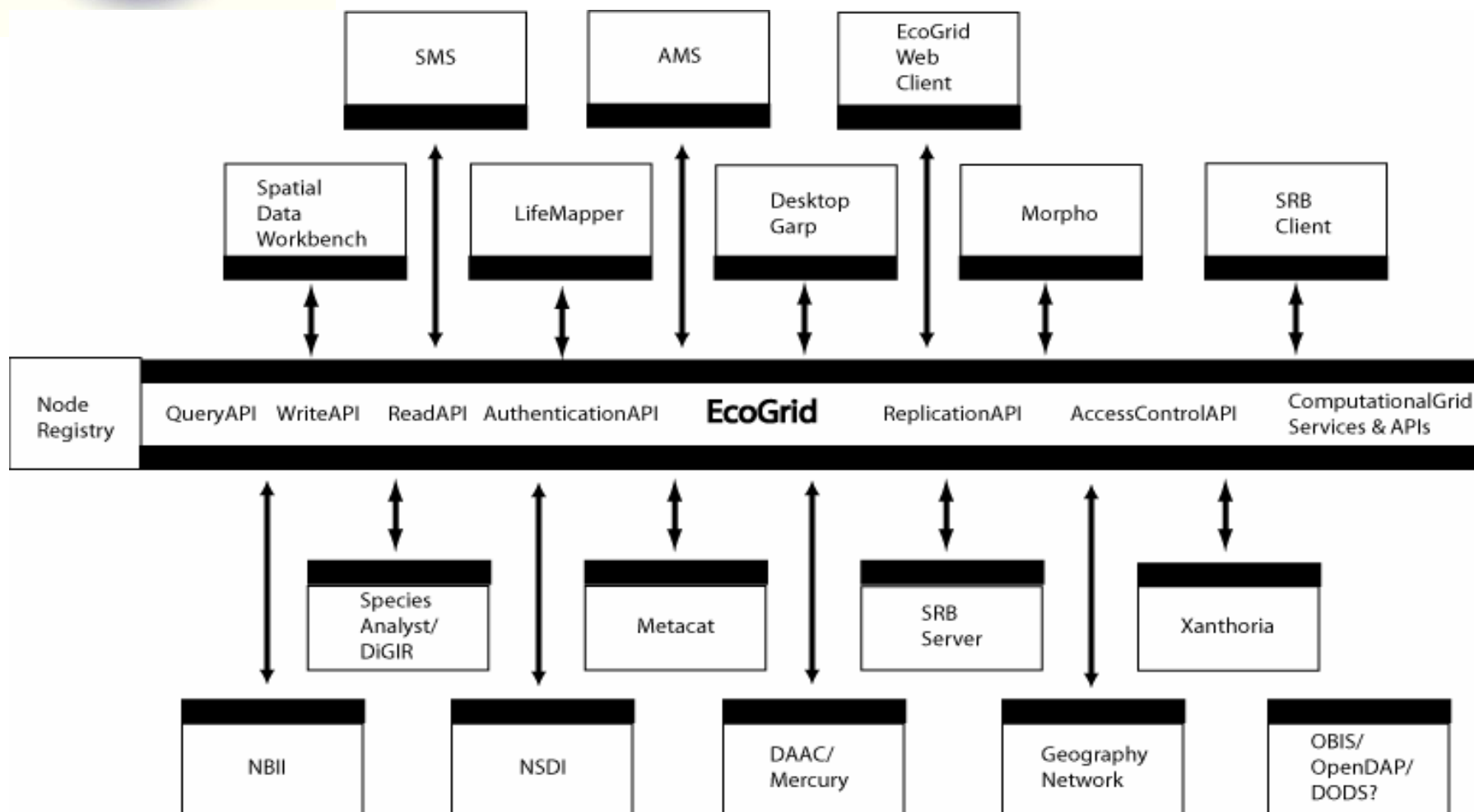
EcoGrid Client Interactions

- Modes of interaction
 - Client-server
 - Fully distributed
 - Peer-to-peer
- EcoGrid Registry
 - Node discovery
 - Service discovery
- Aggregation services
 - Centralized access
 - Reliability
 - Data preservation



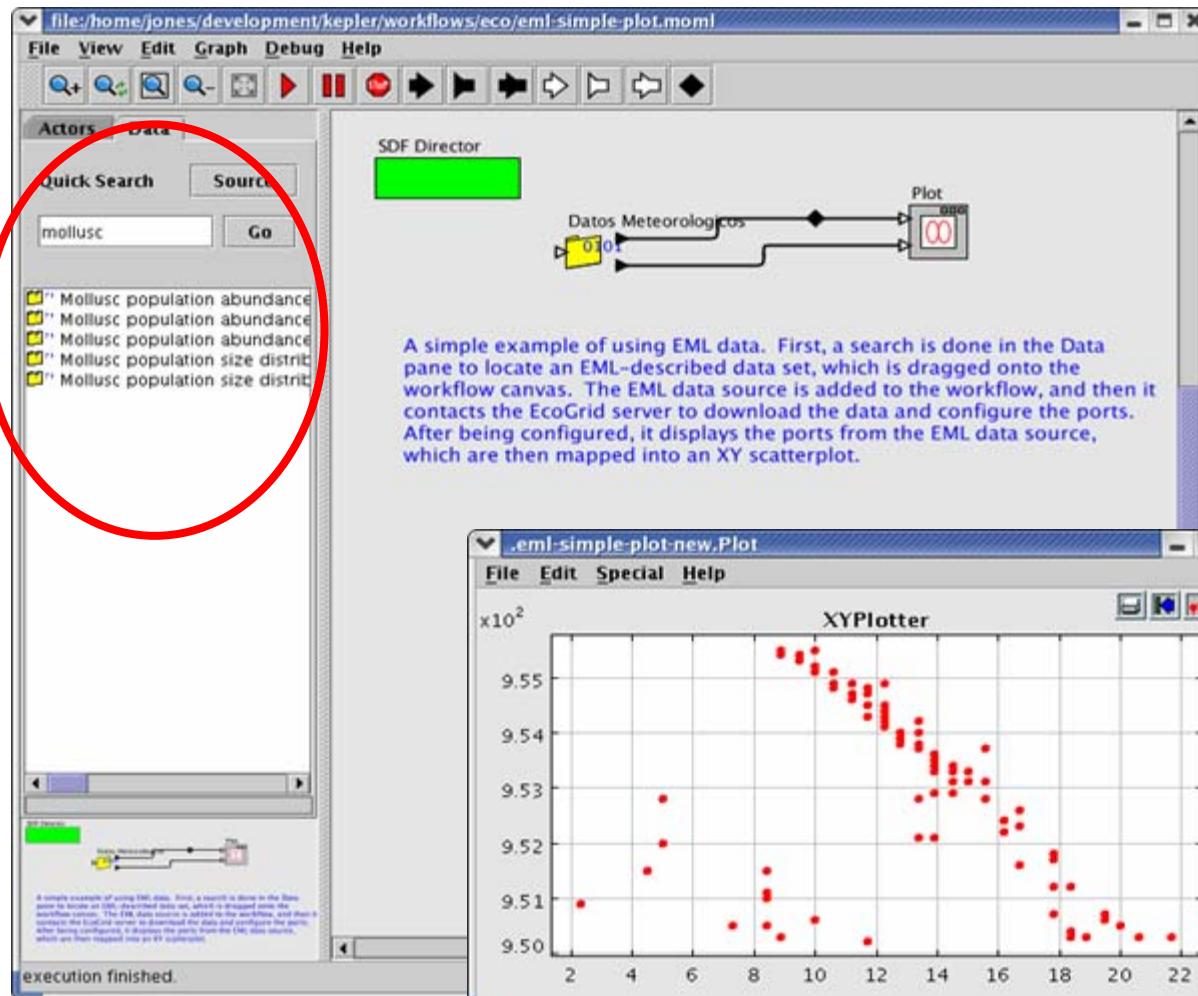


Layers in EcoGrid





Ecogrid Queries in Kepler





EcoGrid in Kepler

Unnamed

File View Edit Graph Debug Help

Components Data

Search

mephitis

Search Reset Cancel Sources

34 results returned.

Services List

Current Data Source(s):

Service Name	Document Type
KNB Metacat EcoGrid QueryInterface	Ecological Metadata Language 2.0.0
	Ecological Metadata Language 2.0.1
KU Digir EcoGrid QueryInterface	Darwin Core 1.0
GEON Search QueryInterface	ADEPT/DLESE/NASA 0.6.50

Add Ok Cancel



Species Search Parameters

Unnamed

File View Edit Graph Debug Help

Components Data

Search

mephitis

Search Reset Cancel

Sources

- disphragis mephitis
- luteimonas mephitis
- mephitis
- mephitis macroura
- mephitis macroura macroura
- mephitis macroura milleri
- mephitis mephitis**
- mephitis mephitis avia
- mephitis mephitis elongata
- mephitis mephitis estor
- mephitis mephitis hodsonica
- mephitis mephitis holzneri
- mephitis mephitis holzneri
- mephitis mephitis hudsonica
- mephitis mephitis hudsonica ?
- mephitis mephitis hudsonicus
- mephitis mephitis major
- mephitis mephitis mephitis
- mephitis mephitis mesomelas
- mephitis mephitis mesomeles
- mephitis mephitis nigra
- mephitis mephitis notata

34 results returned.

mephitis

010

Edit parameters for mephitis

searchData: mephitis

endPoint: http://129.237.127.19:8080/DigirImpl/services/DigirQueryService

providers: ?resource=MammalsDwC2,http://204.140.246.23/DIGIRprov/www/DIGIR.php?resource=MammalsDwC2

tableName: 1135361457578

outputType: As Field

schemaDef:

```
<schema>
  <table name="1135361457578">
    <field name="CatalogNumberText" dataType="STRING"/>
    <field name="CollectionCode" dataType="STRING"/>
    <field name="YearCollected" dataType="STRING"/>
    <field name="Collector" dataType="STRING"/>
    <field name="DecimalLongitude" dataType="FLOAT"/>
    <field name="DecimalLatitude" dataType="FLOAT"/>
    <field name="CatalogNumber" dataType="STRING"/>
    <field name="ScientificName" dataType="STRING"/>
  </table>
</schema>
```

sqlDef:

Commit Add Remove Restore Defaults Preferences Help Cancel

10:1



Darwin Core Table

Unnamed

File View Edit Graph Debug Help

Components Data

Search

Search Reset

Kepler Actor Ontology

- Director
- Workflow Component
 - Actor
 - TypedCompositeActor
 - Complex Structure Actor
 - Constant Actor
 - Control Actor
 - Conversion Actor
 - Datamining Actor
 - Domain Specific Actor
 - External Execution Environment Actor
 - File System Actor
 - Filter
 - GIS Function
 - Grid Function
 - Image Manipulation
 - Input Actor
 - Mathematical Operator
 - Output Actor
 - String Function
 - Web Service

0 results found.

SDF Director

mephitis

Display

..Display

File Help

Campos, Priscilla	3.4028235E38	3.4028235E38	1132094	Disphragis mephitis	
Fonseca, Gilberto	3.4028235E38	3.4028235E38	113704	Disphragis mephitis	
Mora, Gerardo	3.4028235E38	3.4028235E38	1287696	Disphragis mephitis	INB
Saborio, Juan Carlos	3.4028235E38	3.4028235E38	1294344	Disphragis mephitis	
Saborio, Juan Carlos	3.4028235E38	3.4028235E38	1294456	Disphragis mephitis	
Saborio, Juan Carlos	3.4028235E38	3.4028235E38	1294457	Disphragis mephitis	
Quesada, Freddy	3.4028235E38	3.4028235E38	1328865	Disphragis mephitis	INB
Quesada, Javier	3.4028235E38	3.4028235E38	1333738	Disphragis mephitis	INB
Obando, Norman	3.4028235E38	3.4028235E38	1375689	Disphragis mephitis	INB
Quesada, Freddy	3.4028235E38	3.4028235E38	1407024	Disphragis mephitis	INB
Quesada, Freddy	3.4028235E38	3.4028235E38	1407063	Disphragis mephitis	INB
Quesada, Freddy	3.4028235E38	3.4028235E38	1407075	Disphragis mephitis	INB
Quesada, Freddy	3.4028235E38	3.4028235E38	1407076	Disphragis mephitis	INB
Quesada, Freddy	3.4028235E38	3.4028235E38	1407077	Disphragis mephitis	INB



Query Editor

Unnamed

File Help

Standard Intermediate Advanced SQL

Available Table Schemas:

Field Name	Data Type
CatalogNumberText	STRING
CollectionCode	STRING
YearCollected	STRING
Collector	STRING
DecimalLongitude	FLOAT
DecimalLatitude	FLOAT
CatalogNumber	STRING
ScientificName	STRING
InstitutionCode	STRING
Species	STRING

1135361457578

☒ Meets All the Conditions Below ☐ Meets Any of the Conditions Below

Table	Field	Data Type	Display	Operator	Criteria
1135361457578	DecimalLongitude	FLOAT	<input checked="" type="checkbox"/>	LESS THAN	360
1135361457578	DecimalLatitude	FLOAT	<input checked="" type="checkbox"/>	LESS THAN	
			<input type="checkbox"/>		

Query has Changed.



Results of Local Query

Unnamed

File View Edit Graph Debug Help

Components Data

Search

mephitis

Search Reset Cancel

Sources

SDF Director

mephitis

Display

..Display

File	Help
-91.9053	30.0869
-91.6158	30.7606
-92.1935	30.3857
-91.1841	30.4045
-92.0342	30.273
-92.2794	30.8
-92.9773	30.247
-92.6567	30.2221
-92.0195	30.3977



EML Metadata Example

The screenshot displays the SEEK application window, titled 'Unnamed'. The interface includes a menu bar (File, View, Edit, Graph, Debug), a toolbar with navigation icons, and a 'Components' panel on the left. The 'Data' tab is active, showing a search for 'abundance' with 36 results returned. A list of search results is visible, including 'Crab population monitoring: Fall' and 'December 2002 surface water'. The 'GetMetadata' button is highlighted. Below the search results, the 'SDF Director' section shows a green bar and the text 'execution finished.'

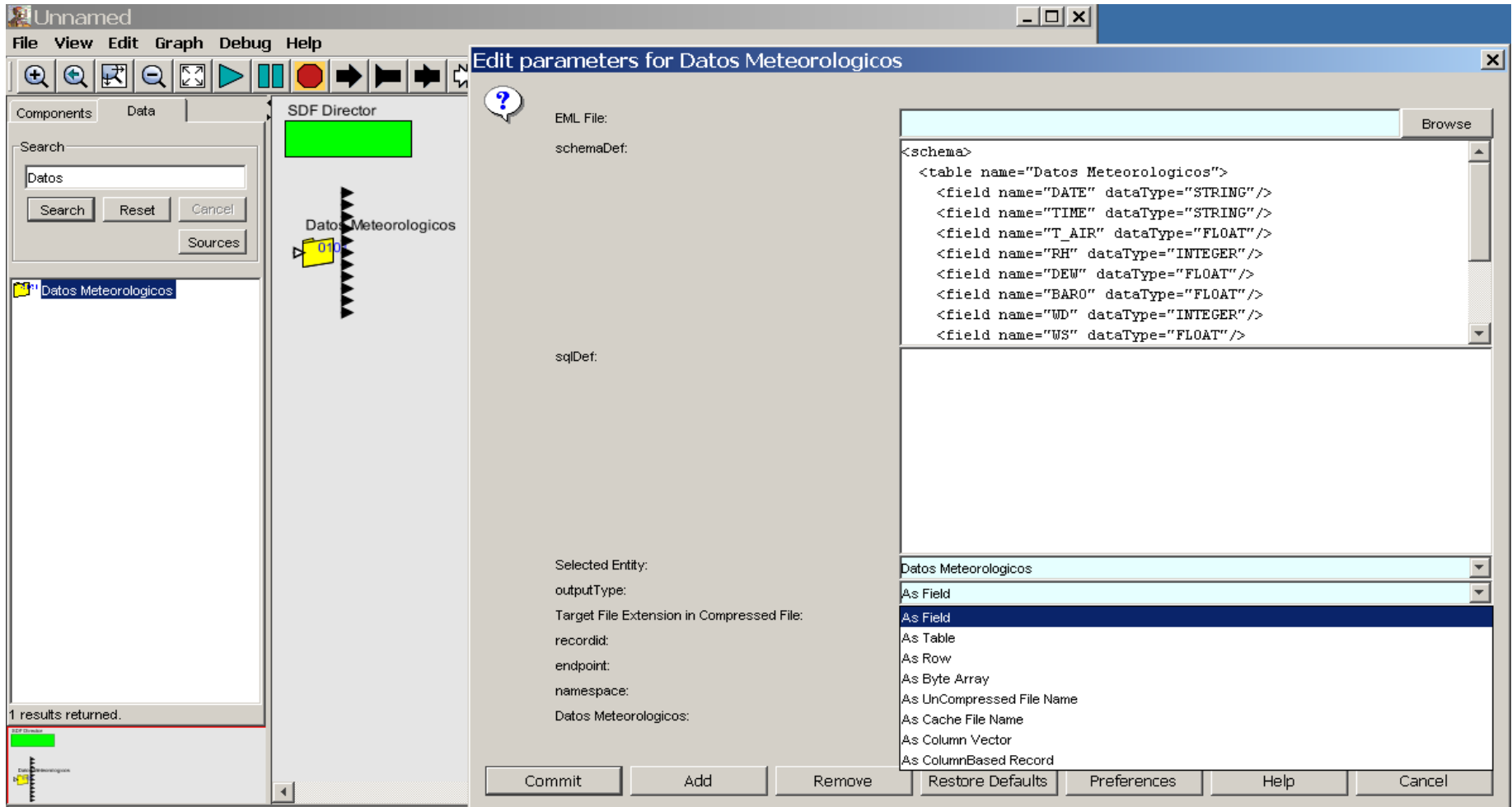
The main window displays the EML metadata for the selected dataset, titled 'file:/C:/Documents%20and%20Settings/D. . ./.kepler/cache/html/knb-lter-gce.109.6'. The metadata is organized into sections:

- Email Address:** tdbish@uga.edu
- Web Address:** <http://lmer.marsci.uga.edu/bios/bishop.html>
- Metadata Provider(s):**
- Organization:** Georgia Coastal Ecosystems LTER Project
- Address:** Dept. of Marine Sciences, University of Georgia, Athens, Georgia 30602-3636 USA
- Email Address:** gcelter@uga.edu
- Web Address:** <http://gce-lter.marsci.uga.edu/lter/>
- Associated Party:**
- Individual:** Dr. Merryl Alber
- Organization:** University of Georgia
- Email Address:** malben@uga.edu
- Individual:** Mr. Kenneth Helm
- Organization:** University of Georgia Marine Institute
- Email Address:** khelm@darientel.net
- Abstract:** This data set is the Fall 2000 estimate of infaunal and epifaunal mollusc abundance at the GCE-LTER marsh sites used for population monitoring. Species abundance was determined by hand-collecting all the infaunal and epifaunal molluscs from within quadrats known area in mid-marsh and creekbank zones (n = 4 quadrats per zone) at all sites. The molluscs were returned to the lab, fixed in formalin, transferred to and preserved in ethanol, counted and measured (size data is reported separately). The counts were converted to number per square meter. Gastropod species are listed first, followed by bivalve species. Size distribution data for these collections may be found in the GCE-LTER data set INV-GCEM-0305a2.
- Keywords:**
 - Sapelo Island (place)
 - Georgia (place)
 - USA (place)
 - GCE (theme)
 - LTER (theme)



EML Data Source

Column Parameters





EML Data Table

Unnamed

File View Edit Graph Debug Help

Components Data

Search

displ

Search Reset

SDF Director

Datos Meteorologicos

Display

Graphical Di

Next Di

Polygor

Polygor

RBox

Exterr

Graph

Plotter

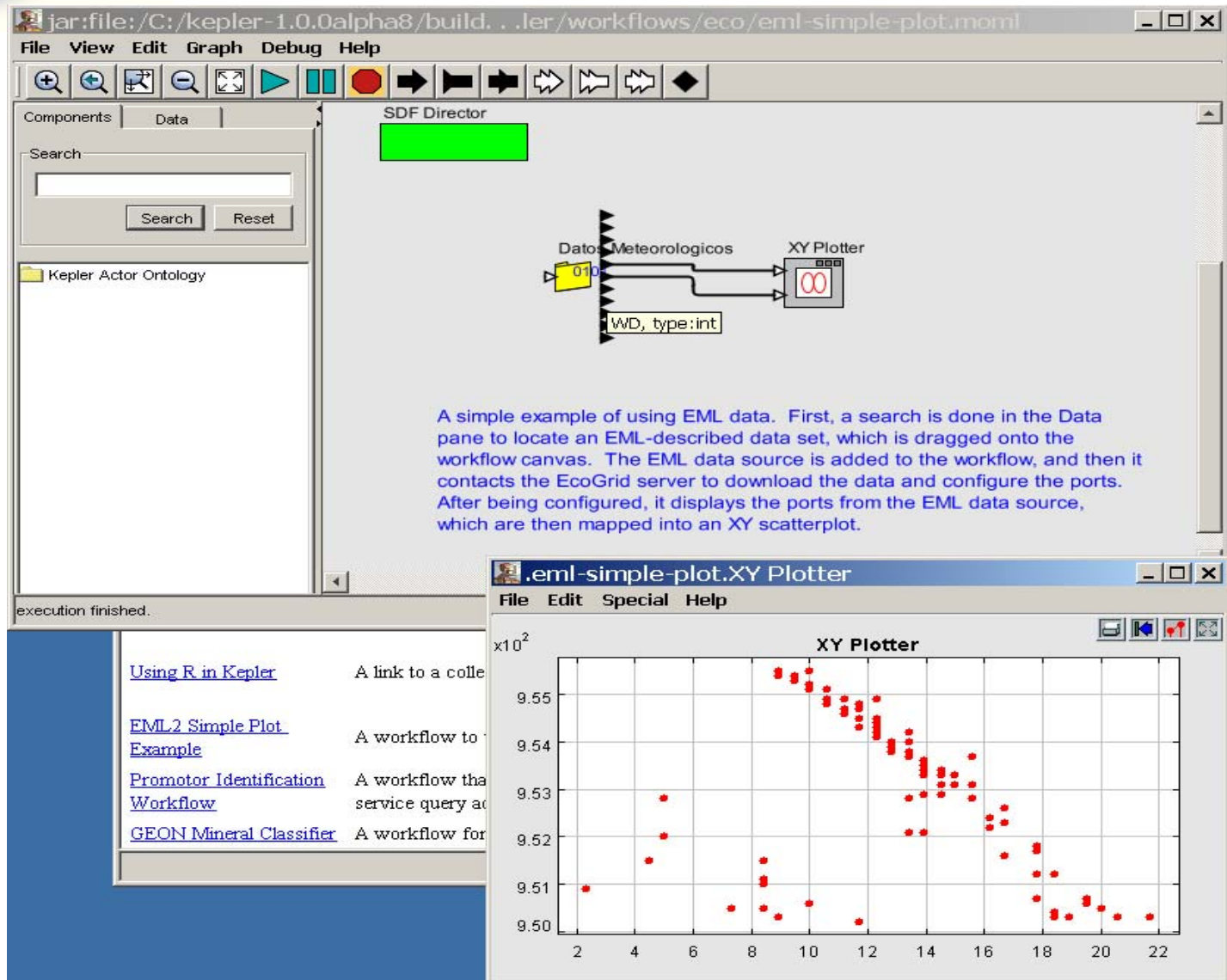
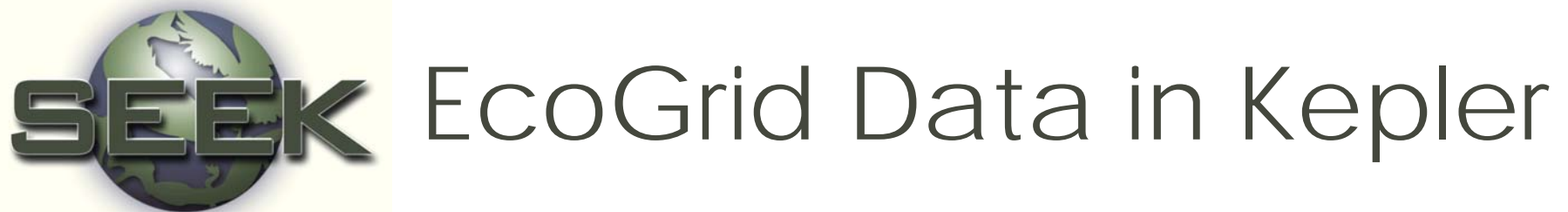
Scope

Textual Out

..Display

File Help

"DATE"	"TIME"	"T_AIR"	"RH"	"DEW"	"BARO"	"WD"	"WS"	"RAIN"	"SOL"	"SOL_SUM"
"01/01/01"	"00:00"	15.0,99	14.5	953.4,099	0.8	0.0,0000	0.0000000			
"01/01/01"	"01:00"	13.4,99	12.8	953.8,100	1.9	0.0,0000	0.0000000			
"01/01/01"	"02:00"	13.4,99	12.8	954.0,114	1.2	0.0,0000	0.0000120			
"01/01/01"	"03:00"	12.4,99	12.3	954.3,114	2.5	0.0,0000	0.0000000			





Spatial Data in Kepler

Unnamed

File View Edit Graph Debug Help

Components Data

Search: IPCC

Search Reset Cancel Sources

Search results:

- a: NIES99 A2a Model: 2050 Radiation
- a: NIES99 A2a Model: 2080 Radiation
- a: NIES99 B2a Model: 2020 Radiation
- a: NIES99 B2a Model: 2050 Radiation
- a: NIES99 B2a Model: 2080 Radiation
- a: 1961-1990, Cloud Cover
- a: 1961-1990, Diurnal Temperature Range
- a: 1961-1990, Ground Frost Frequency
- a: 1961-1990, Maximum Temperature
- a: 1961-1990, Minimum Temperature
- a: 1961-1990, Precipitation
- a: 1961-1990, Radiation
- a: 1961-1990, Vapor Pressure
- a: 1961-1990, Wet Day Frequency
- a: 1961-1990, Wind
- a: CGCM1 A2a Model: 2020 Maximum
- a: CGCM1 A2a Model: 2020 Mean Temperature
- a: CGCM1 A2a Model: 2020 Minimum
- a: CGCM1 A2a Model: 2020 Precipitation
- a: CGCM1 A2a Model: 2020 Wind Speed
- a: CGCM1 A2a Model: 2050 Maximum

335 results returned.

execution finished.

SDF Director

IPCC Climate Change Data: 1961-1990, Maximum Temperature

ClimateFileProcessor

IJMacro

ImageJ

File Edit Image Process Analyze Plugins Window Help

x=196, y=98, value=151.0

1135363584656-24_average_ann.asc

720x360 pixels; 32-bit grayscale; 1012K



Acknowledgements

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