eResearch	**Research Data Archive API Documentation**
	This document describes the Application Programming Interface (API) for the Research Data Archive and search capabilities.

1.   Introduction

In order to provide better services to the creators/funders of products in the Research Data Archive, a Web Service feature will allow websites to pull product information to display on their websites. It will allow those websites to keep their format and structure and the ability to pull information so they can display customized.

APIs are used to tell how software should interact with each other. This document provides API information necessary for the Research Data Archive web service.

2.   API Example Call

A sample HTTP request is analyzed below. This particular one returns a single product which is ID RDS-2006-0001.

http://www.fs.usda.gov/rds/archive/webservice/product?id=RDS-2006-0001

Each API call has a number of key components. The example above has:

1. **http://www.fs.usda.gov/rds/archive/webservice/product** - a constant location of the page that accepts the parameters and returns the requested information.

2. **id=RDS-2006-0001** - Parameter for the product ID

3.   API List

API	Description
/search	Finds products that match the search criteria
/product	Returns a single product
/organizations	Returns a list of organizations that can be used for the global "funder" parameter as well as product counts.
/efrs	Returns a list of Experimental Forests and Ranges (EFRs) which have products in the Research Data Archive

4.   Global Settings

4.1.   Format Parameter

Each API call can utilize the below parameters:

Parameter	Description	Type	Format	Required?

Format	The return format	String	Lower case with the following values: • xml *(default)* • json	No

Sample Call

http://www.fs.usda.gov/rds/archive/webservice/search?funder=USDA+Forest+Service,+Rocky+Mountain+Research+Station&**format**=json

http://www.fs.usda.gov/rds/archive/webservice/product?id=RDS-2006-0001&**format**=json

4.2.   Boolean Elements

Several elements are returned throughout the APIs that are prefixed with "***is_***". These return either a 0 or 1 which are to be treated as false or true, respectively.

5.   Search API

This web service will return a list of products that match the criteria of the API key given.

Parameters

Parameter	Description	Type	Format	Required?
Query	The search query	string	Upper or lower case	No
Page	The starting page for pagination	integer	Any positive integer	No
Rows	How many rows to return	integer	Any positive integer *(default is 10)*	No
Sort	How to sort the results	string	Lower case with the following values: • date *(default)* • score	No
Funder	Filter the results based on the funder's name **or** acronym	String	Exact format found from "organizations" API result	No

EFR	Filter the results based on if a product is related to a particular EFR	String	Exact format found from "efrs" API result	No

Sample Call (XML)

http://www.fs.usda.gov/rds/archive/webservice/search?query=tree&page=2

Returns (XML)

```xml
<xml>
    <response>
        <QTime>0.22186493873596</QTime>
        <numFound>32</numFound>
        <page>2</page>
        <start>10</start>
        <rows>10</rows>
        <products>
            <product>

                <id>RDS-2011-0003.3</id>
                <title>Presence and absence of butterflies in the Shoshone
Mountains and Toiyabe and Toquima ranges, Nevada (3rd Edition)</title>
                <edition>3rd</edition>
                <doi>http://dx.doi.org/10.2737/RDS-2011-0003.3</doi>
                <abstract>These data document observed presence of
butterflies in canyons throughout three mountain ranges in the central Great
Basin (Lander and Nye counties, Nevada): the Shoshone Mountains, Toiyabe
Range, and Toquima Range. Data were collected from 1995 through 2005,
inclusive, and in 2013 and 2014. Records for each year reflect multiple
visits (generally 5 or 6) at about 10-14 day intervals from late May or early
June through late August or early September. Data include species detected,
date, location, abundance, and whether the species is a nonresident,
resident, or montane resident.</abstract>
                <authors>
                    <author>Fleishman, Erica</author>
                    <author>...</author>
                </authors>
                <publisher>Forest Service Research Data Archive</publisher>
                <publication_places>
                    <publication_place>Fort Collins, CO</publication_place>
                    <publication_place>...</publication_place>
                </publication_places>
                <keywords>
                    <keyword>lepidoptera</keyword>
                    <keyword>...</keyword>
                </keywords>
                <places>
                    <place>central Nevada</place>
                    <place>...</place>
                </places>
                <is_gis>0</is_gis>
                <publication_year>2015</publication_year>
                <files>
```

```xml
<metadata>http://www.fs.usda.gov/rds/fedora/objects/RDS:RDS-2011-
0003.3/datastreams/_metadata_RDS-2011-0003.3/content</metadata>

<fileindex>http://www.fs.usda.gov/rds/fedora/objects/RDS:RDS-2011-
0003.3/datastreams/_fileindex_RDS-2011-0003.3/content</fileindex>
                    <data>
                        <datum>http://dx.doi.org/10.2737/RDS-2011-
0003.3</datum>
                    </data>
                </files>
                <coordinates>
                    <label>central Nevada</label>
                    <east>-116.727651723747</east>
                    <north>39.4429268147128</north>
                    <south>38.6448263136483</south>
                    <west>-117.575132871775</west>
                </coordinates>
                <funders>
                    <funder>
                        <name>Joint Fire Science Program</name>
                        <acronym>JFSP</acronym>
                    </funder>
                    <funder>
                        ...
                    </funder>
                </funders>
                <contributors>
                    <contributor>Funds for data collection and archival
primarily were provided by the Joint Fire Science Program via cooperative
agreements with the Rocky Mountain Research Station (JFSP 00-2-15, 01B-3-3-
01, 05-2-1-94) and by the Strategic Environmental Research and Development
Program of the Department of Defense (contract W912HQ-12-C-0033, project RC-
2202).</contributor>
                    <contributor>...</contributor>
                </contributors>
                <formats>
                    <format>tabular digital data</format>
                    <format>...</format>
                </formats>
                <rights>These data were collected using funding from the U.S.
Government and can be used without additional permissions or fees. If you use
these data in a publication, presentation, or other research product please
use the citation below when citing the data product:

                    Fleishman, Erica. 2015. Presence and absence of butterflies
in the Shoshone Mountains and Toiyabe and Toquima ranges, Nevada. 3rd
Edition. Fort Collins, CO: Forest Service Research Data Archive.
http://dx.doi.org/10.2737/RDS-2011-0003.3</rights>
                    <latest_edition/>
                </product>
                <product>
                    ...
                </product>
            </products>
        </response>
</xml>
```

Sample Call (JSON)

http://www.fs.usda.gov/rds/archive/webservice/search?query=tree&page=2&format=json

Returns (JSON)

```
{
    "response":{
        "QTime":"0.26134610176086",
        "numFound":32,
        "page":2,
        "start":10,
        "rows":"10",
        "products":[
                {
                    "id":"RDS-2011-0003.3",
                    "title":"Presence and absence of butterflies in the Shoshone
Mountains and Toiyabe and Toquima ranges, Nevada (3rd Edition)",
                    "edition":"3rd",
                    "doi":"http://dx.doi.org/10.2737/RDS-2011-0003.3",
                    "abstract":"These data document observed presence of
butterflies in canyons throughout three mountain ranges in the central Great
Basin (Lander and Nye counties, Nevada): the Shoshone Mountains, Toiyabe
Range, and Toquima Range. Data were collected from 1995 through 2005,
inclusive, and in 2013 and 2014. Records for each year reflect multiple
visits (generally 5 or 6) at about 10-14 day intervals from late May or early
June through late August or early September. Data include species detected,
date, location, abundance, and whether the species is a nonresident,
resident, or montane resident.",
                    "authors":[
                        "Fleishman, Erica",
                        ...
                    ],
                    "publisher":"Forest Service Research Data Archive",
                    "publication_places":[
                        "Fort Collins, CO",
                        ...
                    ],
                    "keywords":[
                        "lepidoptera",
                        ...
                    ],
                    "places":[
                        "central Nevada",
                        ...
                    ],
                    "is_gis":false,
                    "publication_year":"2015",
                    "files":{

"metadata":"http://www.fs.usda.gov/rds/fedora/objects/RDS:RDS-2011-
0003.3/datastreams/_metadata_RDS-2011-0003.3/content",

"fileindex":"http://www.fs.usda.gov/rds/fedora/objects/RDS:RDS-2011-
0003.3/datastreams/_fileindex_RDS-2011-0003.3/content",
                    "data":[
                        "http://dx.doi.org/10.2737/RDS-2011-0003.3"
```

```json
                ]
            },
            "coordinates":{
                "label":"central Nevada",
                "east":"-116.727651723747",
                "north":"39.4429268147128",
                "south":"38.6448263136483",
                "west":"-117.575132871775"
            },
            "funders":[
                {
                    "name":"Joint Fire Science Program",
                    "acronym":"JFSP"
                },
                {
                    ...
                }
            ],
            "contributors":[
                "Erica Fleishman\n\nFunds for data collection and
archival primarily were provided by the Joint Fire Science Program via
cooperative agreements with the Rocky Mountain Research Station (JFSP 00-2-
15, 01B-3-3-01, 05-2-1-94) and by the Strategic Environmental Research and
Development Program of the Department of Defense (contract W912HQ-12-C-0033,
project RC-2202).",
                ...
            ],
            "formats":[
                "tabular digital data",
                ...
            ],
            "rights":"These data were collected using funding from the
U.S. Government and can be used without additional permissions or fees. If
you use these data in a publication, presentation, or other research product
please use the citation below when citing the data product:  \n\nFleishman,
Erica. 2015. Presence and absence of butterflies in the Shoshone Mountains
and Toiyabe and Toquima ranges, Nevada. 3rd Edition. Fort Collins, CO: Forest
Service Research Data Archive. http://dx.doi.org/10.2737/RDS-2011-0003.3",
                "lastest_edition":""
        },
        {
            ...
        }
    ]
    }
}
```

6.   Product API

This web service will return data associated with the specified product ID.

Parameters

Parameter	Description	Type	Format	Required?

Id	The product ID	String	Upper or lower case, restricted to alphanumerical, dashes (-), and periods (.)	Yes

Sample Call (XML)

http://www.fs.usda.gov/rds/archive/webservice/product?id=RDS-2006-0001

Returns (XML)

```xml
<xml>
    <response>
        <QTime>0.17654991149902</QTime>
        <product>

            <id>RDS-2011-0003.3</id>
            <title>Presence and absence of butterflies in the Shoshone
Mountains and Toiyabe and Toquima ranges, Nevada (3rd Edition)</title>
            <edition>3rd</edition>
            <doi>http://dx.doi.org/10.2737/RDS-2011-0003.3</doi>
            <abstract>These data document observed presence of butterflies in
canyons throughout three mountain ranges in the central Great Basin (Lander
and Nye counties, Nevada): the Shoshone Mountains, Toiyabe Range, and Toquima
Range. Data were collected from 1995 through 2005, inclusive, and in 2013 and
2014. Records for each year reflect multiple visits (generally 5 or 6) at
about 10-14 day intervals from late May or early June through late August or
early September. Data include species detected, date, location, abundance,
and whether the species is a nonresident, resident, or montane
resident.</abstract>
            <publication_year>2015</publication_year>
            <authors>
                <author>Fleishman, Erica</author>
                <author>...</author>
            </authors>
            <publisher>Forest Service Research Data Archive</publisher>
            <publication_places>
                <publication_place>Fort Collins, CO</publication_place>
                <publication_place>...</publication_place>
            </publication_places>
            <funders>
                <funder>
                    <name>Joint Fire Science Program</name>
                    <acronym>JFSP</acronym>
                </funder>
                <funder>
                    ...
                </funder>
            </funders>
            <contributors>
                <contributor>Funds for data collection and archival primarily
were provided by the Joint Fire Science Program via cooperative agreements
with the Rocky Mountain Research Station (JFSP 00-2-15, 01B-3-3-01, 05-2-1-
94) and by the Strategic Environmental Research and Development Program of
the Department of Defense (contract W912HQ-12-C-0033, project RC-
```

```
2202).</contributor>
                <contributor>...</contributor>
            </contributors>
            <keywords>
                <keyword>lepidoptera</keyword>
                <keyword>...</keyword>
            </keywords>
            <places>
                <place>central Nevada</place>
                <place>...</place>
            </places>
            <formats>
                <format>tabular digital data</format>
                <format>...</format>
            </formats>
            <coordinates>
                <label>central Nevada</label>
                <east>-116.727651723747</east>
                <north>39.4429268147128</north>
                <south>38.6448263136483</south>
                <west>-117.575132871775</west>
            </coordinates>
            <is_gis>0</is_gis>
            <rights>These data were collected using funding from the U.S.
Government and can be used without additional permissions or fees. If you use
these data in a publication, presentation, or other research product please
use the citation below when citing the data product:

            Fleishman, Erica. 2015. Presence and absence of butterflies in
the Shoshone Mountains and Toiyabe and Toquima ranges, Nevada. 3rd Edition.
Fort Collins, CO: Forest Service Research Data Archive.
http://dx.doi.org/10.2737/RDS-2011-0003.3</rights>
            <files>
                <metadata>http://www.fs.usda.gov/rds/fedora/objects/RDS:RDS-
2011-0003.3/datastreams/_metadata_RDS-2011-0003.3/content</metadata>
                <fileindex>http://www.fs.usda.gov/rds/fedora/objects/RDS:RDS-
2011-0003.3/datastreams/_fileindex_RDS-2011-0003.3/content</fileindex>
                <data>
                    <datum>http://dx.doi.org/10.2737/RDS-2011-0003.3</datum>
                </data>
            </files>
            <latest_edition/>
        </product>
    </response>
</xml>
```

Sample Call (JSON)

http://www.fs.usda.gov/rds/archive/webservice/product?id=RDS-2006-0001&format=json

Returns (JSON)

```
{
    "response":{
        "QTime":"0.58228707313538",
        "product":{
            "id":"RDS-2011-0003.3",
```

```
            "title":"Presence and absence of butterflies in the Shoshone
Mountains and Toiyabe and Toquima ranges, Nevada (3rd Edition)",
            "edition":"3rd",
            "doi":"http://dx.doi.org/10.2737/RDS-2011-0003.3",
            "abstract":"These data document observed presence of butterflies
in canyons throughout three mountain ranges in the central Great Basin
(Lander and Nye counties, Nevada): the Shoshone Mountains, Toiyabe Range, and
Toquima Range. Data were collected from 1995 through 2005, inclusive, and in
2013 and 2014. Records for each year reflect multiple visits (generally 5 or
6) at about 10-14 day intervals from late May or early June through late
August or early September. Data include species detected, date, location,
abundance, and whether the species is a nonresident, resident, or montane
resident.",
            "publication_year":"2015",
            "authors":[
                "Fleishman, Erica",
                ...
            ],
            "publisher":"Forest Service Research Data Archive",
            "publication_places":[
                "Fort Collins, CO",
                ...
            ],
            "funders":[
                {
                    "name":"Joint Fire Science Program",
                    "acronym":"JFSP"
                },
                {
                    ...
                }
            ],
            "contributors":[
                "Erica Fleishman\n\nFunds for data collection and archival
primarily were provided by the Joint Fire Science Program via cooperative
agreements with the Rocky Mountain Research Station (JFSP 00-2-15, 01B-3-3-
01, 05-2-1-94) and by the Strategic Environmental Research and Development
Program of the Department of Defense (contract W912HQ-12-C-0033, project RC-
2202).",
                ...
            ],
            "keywords":[
                "lepidoptera",
                ...
            ],
            "places":[
                "central Nevada",
                ...
            ],
            "formats":[
                "tabular digital data",
                ...
            ],
            "coordinates":{
                "label":"central Nevada",
                "east":"-116.727651723747",
                "north":"39.4429268147128",
                "south":"38.6448263136483",
```

```
              "west":"-117.575132871775"
          },
          "is_gis":false,
          "rights":"These data were collected using funding from the U.S.
Government and can be used without additional permissions or fees. If you use
these data in a publication, presentation, or other research product please
use the citation below when citing the data product:  \n\nFleishman, Erica.
2015. Presence and absence of butterflies in the Shoshone Mountains and
Toiyabe and Toquima ranges, Nevada. 3rd Edition. Fort Collins, CO: Forest
Service Research Data Archive. http://dx.doi.org/10.2737/RDS-2011-0003.3",
          "files":{

"metadata":"http://www.fs.usda.gov/rds/fedora/objects/RDS:RDS-2011-
0003.3/datastreams/_metadata_RDS-2011-0003.3/content",

"fileindex":"http://www.fs.usda.gov/rds/fedora/objects/RDS:RDS-2011-
0003.3/datastreams/_fileindex_RDS-2011-0003.3/content",
              "data":[
                  "http://dx.doi.org/10.2737/RDS-2011-0003.3"
              ]
          },
          "lastest_edition":""
      }
  }
}
```

7.   Organizations API

This web service will return a list of organizations that can be used for the "funder" parameter as well as product counts.

Parameters

Parameter	Description	Type	Format	Required?
None				

Sample Call (XML)

http://www.fs.usda.gov/rds/archive/webservice/organizations

Returns (XML)

```
<xml>
    <response>
        <QTime>0.00617480278015</QTime>
        <numFound>28</numFound>
        <organizations>
            <organization>
                <name>USDA Forest Service, Rocky Mountain Research
Station</name>
                <acronym>RMRS</acronym>
                <count>103</count>
            </organization>
```

```
            <organization>
                ...
            </organization>
        </organizations>
    </response>
</xml>
```

Sample Call (JSON)

```
http://www.fs.usda.gov/rds/archive/webservice/organizations?format=json
```

Returns (JSON)

```json
{
    "response":{
        "QTime":"0.00585699081421",
        "numFound":28,
        "organizations":[
            {
                "name":"USDA Forest Service, Rocky Mountain Research Station"
                "count":103,
            },
            {
                ...
            }
        ]
    }
}
```

8.   EFRs API

This web service will return a list of Experimental Forests and Ranges (EFRs) that can be used for the "efr" parameter as well as product counts.

Parameters

Parameter	Description	Type	Format	Required?
None				

Sample Call (XML)

```
http://www.fs.usda.gov/rds/archive/webservice/efrs
```

Returns (XML)

```xml
<xml>
    <response>
        <QTime>0.00617480278015</QTime>
        <numFound>18</numFound>
        <efrs>
            <efr>
                <name>Black Hills Experimental Forest</name>
                <count>1</count>
```

```
            </efr>
            <efr>
                ...
            </efr>
        </efrs>
    </response>
</xml>
```

Sample Call (JSON)

```
http://www.fs.usda.gov/rds/archive/webservice/efrs?format=json
```

Returns (JSON)

```json
{
    "response":{
        "QTime":"0.00585699081421",
        "numFound":18,
        "efrs":[
            {
                "name":"Black Hills Experimental Forest"
                "count":1,
            },
            {
                ...
            }
        ]
    }
}
```