

# Package ‘echor’

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**Type** Package

**Title** Access EPA 'ECHO' Data

**Version** 0.1.9

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**Description** An R interface to United States Environmental Protection Agency (EPA) Environmental Compliance History Online ('ECHO') Application Program Interface (API). 'ECHO' provides information about EPA permitted facilities, discharges, and other reporting info associated with permitted entities. Data are obtained from <<https://echo.epa.gov/>>.

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**Encoding** UTF-8

**RoxygenNote** 7.2.3

**Imports** curl, dplyr, httr, plyr, progress, purrr, readr, rlang, sf, tibble, tidyr (>= 1.0.0), utils

**Suggests** httpptest, testthat, utf8

**BugReports** <https://github.com/mps9506/echor/issues>

**URL** <https://github.com/mps9506/echor>, <https://mps9506.github.io/echor/>

**Language** en-US

**Config/Needs/website** mps9506/mpsTemplates, ggplot2, ggrepel, ggspatial, here, kableExtra, knitr, raster, rmarkdown, sf

**NeedsCompilation** no

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**Repository** CRAN

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downloadDMRs	<i>Download Multiple DMRs</i>
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### Description

Returns DMRs in a nested list using `echoGetEffluent()`. Uses a dataframe with a column of `p_id` numbers. Please note that `p_id`'s are case sensitive.

### Usage

```
downloadDMRs(df, idColumn, pBar = TRUE, verbose = FALSE, ...)
```

### Arguments

<code>df</code>	dataframe with column of id numbers
<code>idColumn</code>	unquoted string, name of column containing the <code>p_id</code> permit numbers
<code>pBar</code>	logical, display a progress bar? Defaults to TRUE
<code>verbose</code>	logical, indicating whether to provide processing and retrieval messages. Defaults to FALSE. Suggest leaving this FALSE if <code>pBar = TRUE</code> .
<code>...</code>	additional arguments passed to <code>echoGetEffluent</code>

### Value

dataframe `df`, with a column containing the discharge monitoring reports downloaded with `echoGetEffluentSummary`

## Examples

```
## This example requires an internet connection to run

## Retrieve multiple DMRs for flow

df <- tibble::tibble("id" = c('TX0119407', 'TX0132187'))
df <- downloadDMRs(df, id)
```

---

echoAirGetFacilityInfo

*Downloads EPA ECHO permitted air emitter information*

---

## Description

Returns a dataframe or simplefeature dataframe of permitted facilities returned by the query. Uses EPA's ECHO API: [https://echo.epa.gov/tools/web-services/facility-search-air#!/Facilities/get\\_air\\_rest\\_services\\_get\\_facility\\_info](https://echo.epa.gov/tools/web-services/facility-search-air#!/Facilities/get_air_rest_services_get_facility_info)

## Usage

```
echoAirGetFacilityInfo(output = "df", verbose = FALSE, ...)
```

## Arguments

output	Character string specifying output format. output = 'df' for a dataframe or output = 'sf' for a simple features spatial dataframe. See ( <a href="https://CRAN.R-project.org/package=sf">https://CRAN.R-project.org/package=sf</a> ) for more information about simple features.
verbose	Logical, indicating whether to provide processing and retrieval messages. Defaults to FALSE
...	Further arguments passed as query parameters in request sent to EPA ECHO's API. For more options see: <a href="https://echo.epa.gov/tools/web-services/facility-search-water#!/Facility_Information/get_air_rest_services_get_facility_info">https://echo.epa.gov/tools/web-services/facility-search-water#!/Facility_Information/get_air_rest_services_get_facility_info</a> for a complete list of parameter options. Examples provided below.

## Value

dataframe or sf dataframe suitable for plotting

## Examples

```
## These examples require an internet connection to run

## Retrieve table of facilities by bounding box
```

```
echoAirGetFacilityInfo(xmin = '-96.407563',
  ymin = '30.554395',
  xmax = '-96.25947',
  ymax = '30.751984',
  output = 'df')

## Retrieve a simple features dataframe by bounding box
spatialdata <- echoAirGetFacilityInfo(xmin = '-96.407563',
  ymin = '30.554395',
  xmax = '-96.25947',
  ymax = '30.751984',
  output = 'sf')
```

---

echoAirGetMeta

*Downloads EPA ECHO Air Facility Metadata*

---

## Description

Returns variable name and descriptions for parameters returned by [echoAirGetFacilityInfo](#)

## Usage

```
echoAirGetMeta(verbose = FALSE)
```

## Arguments

**verbose** Logical, indicating whether to provide processing and retrieval messages. Defaults to FALSE

## Value

returns a dataframe

## Examples

```
## These examples require an internet connection to run

# returns a dataframe of
echoAirGetMeta()
```

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echoGetCAAPR	<i>Download EPA ECHO emissions inventory report data</i>
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**Description**

Download EPA ECHO emissions inventory report data

**Usage**

```
echoGetCAAPR(p_id, verbose = FALSE, ...)
```

**Arguments**

p_id	character string specify the identifier for the service. Required.
verbose	Logical, indicating whether to provide processing and retrieval messages. Defaults to FALSE
...	Additional arguments

**Value**

dataframe

**Examples**

```
## This example requires an internet connection to run
echoGetCAAPR(p_id = '11000350174')
```

---

echoGetEffluent	<i>Downloads EPA ECHO DMR records of dischargers with NPDES permits</i>
-----------------	---

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**Description**

Uses EPA ECHO API to download the Discharge Monitoring Record (DMR) of a single plant, identified with p\_id. Please note that the p\_id is case sensitive.

**Usage**

```
echoGetEffluent(p_id, verbose = FALSE, ...)
```

**Arguments**

p_id	Character string specify the identifier for the service. Required. Case sensitive.
verbose	Logical, indicating whether to provide processing and retrieval messages. Defaults to FALSE
...	Further arguments passed on as query parameters sent to EPA's ECHO API. For more options see: <a href="https://echo.epa.gov/tools/web-services/effluent-charts#!/Effluent_Charts/get_eff_rest_services_get_effluent_chart">https://echo.epa.gov/tools/web-services/effluent-charts#!/Effluent_Charts/get_eff_rest_services_get_effluent_chart</a>

**Value**

Returns a dataframe.

**Examples**

```
## This example requires an internet connection to run

## Retrieve single DMR for flow

echoGetEffluent(p_id = 'tx0119407', parameter_code = '50050')
```

---

echoGetFacilities      *Downloads permitted facility information*

---

**Description**

Provides interface for downloading facility information from Clean Air Act, Clean Water Act, and Safe Drinking Water Act permitted facilities.

**Usage**

```
echoGetFacilities(program, output = "df", verbose = FALSE, ...)
```

**Arguments**

program	Character, either program = 'caa', program = 'cwa', or program = 'sdw'. 'caa' retrieves facilities permitted under the Clean Air Act, 'cwa' retrieves facilities permitted under the Clean Water Act, and 'sdw' retrieves facilities permitted under the the Safe Drinking Water Act.
output	Character string specifying output format. output = 'df' for a dataframe or output = 'sf' for a simple features spatial dataframe. 'sf' only applies to CAA and CWA queries.
verbose	Logical, indicating whether to provide processing and retrieval messages. Defaults to FALSE.
...	Further arguments passed as query parameters in request sent to EPA ECHO's API.

**Value**

dataframe or sf dataframe suitable for plotting

---

echoGetReports      *Downloads self reported discharge and emissions data*

---

**Description**

Downloads self reported discharge and emissions data

**Usage**

```
echoGetReports(program, p_id, verbose = FALSE, ...)
```

**Arguments**

program	Character, either program = 'caa' or program = 'cwa'. 'caa' retrieves facilities permitted under the Clean Air Act, 'cwa' retrieves facilities permitted under the Clean Water Act.
p_id	Character string specify the identifier for the service. Required.
verbose	Logical, indicating whether to provide processing and retrieval messages. Defaults to FALSE.
...	Further arguments passed on as query parameters sent to EPA's ECHO API.

**Value**

Returns a dataframe

---

echoSDWGetMeta      *Downloads EPA ECHO Safe Drinking Water Facilities Metadata*

---

**Description**

Downloads EPA ECHO Safe Drinking Water Facilities Metadata

**Usage**

```
echoSDWGetMeta(verbose = FALSE)
```

**Arguments**

verbose	Logical, indicating whether to provide processing and retrieval messages. Defaults to FALSE
---------	---

**Value**

returns a dataframe

**Examples**

```
## These examples require an internet connection to run

# returns a dataframe of
echoSDWGetMeta()
```

---

echoSDWGetSystems	<i>Downloads public water system information</i>
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**Description**

Returns a dataframe of permitted public water systems returned by the query. Uses EPA's ECHO API: [https://echo.epa.gov/tools/web-services/facility-search-drinking-water#!/Safe\\_Drinking\\_Water/get\\_sdw\\_rest\\_services\\_get\\_systems](https://echo.epa.gov/tools/web-services/facility-search-drinking-water#!/Safe_Drinking_Water/get_sdw_rest_services_get_systems).

**Usage**

```
echoSDWGetSystems(verbose = FALSE, ...)
```

**Arguments**

verbose	Logical, indicating whether to provide processing and retrieval messages. Defaults to FALSE
...	Further arguments passed as query parameters in request sent to EPA ECHO's API. For more options see: <a href="https://echo.epa.gov/tools/web-services/facility-search-drinking-water#!/Safe_Drinking_Water/get_sdw_rest_services_get_systems">https://echo.epa.gov/tools/web-services/facility-search-drinking-water#!/Safe_Drinking_Water/get_sdw_rest_services_get_systems</a> for a complete list of parameter options. Examples provided below.

**Value**

returns a dataframe

**Examples**

```
## These examples require an internet connection to run
echoSDWGetSystems(p_co = "Brazos", p_st = "tx")
```



---

`echoWaterGetFacilityInfo`*Downloads EPA ECHO water facility information*

---

### Description

Returns a dataframe or simplefeature dataframe of permitted facilities returned by the query. Uses EPA's ECHO API: <https://echo.epa.gov/tools/web-services/facility-search-water>.

### Usage

```
echoWaterGetFacilityInfo(output = "df", verbose = FALSE, ...)
```

### Arguments

<code>output</code>	Character string specifying output format. <code>output = 'df'</code> for a dataframe or <code>output = 'sf'</code> for a simple features spatial dataframe. See ( <a href="https://CRAN.R-project.org/package=sf">https://CRAN.R-project.org/package=sf</a> ) for more information about simple features.
<code>verbose</code>	Logical, indicating whether to provide processing and retrieval messages. Defaults to FALSE
<code>...</code>	Further arguments passed as query parameters in request sent to EPA ECHO's API. For more options see: <a href="https://echo.epa.gov/tools/web-services/facility-search-water#!/Facility_Information/get_cwa_rest_services_get_facility_info">https://echo.epa.gov/tools/web-services/facility-search-water#!/Facility_Information/get_cwa_rest_services_get_facility_info</a> for a complete list of parameter options. Examples provided below.

### Value

returns a dataframe or simple features dataframe

### Examples

```
## These examples require an internet connection to run

## Retrieve table of facilities by bounding box
echoWaterGetFacilityInfo(xmin = '-96.407563',
  ymin = '30.554395',
  xmax = '-96.25947',
  ymax = '30.751984',
  p_pcomp = 'POW',
  output = 'df')

## Retrieve a simple features dataframe by bounding box
spatialdata <- echoWaterGetFacilityInfo(xmin = '-96.407563',
  ymin = '30.554395',
  xmax = '-96.25947',
  ymax = '30.751984',
```

```
p_pcomp = 'POW',  
output = 'sf')
```

---

echoWaterGetMeta      *Downloads EPA ECHO Water Facility Metadata*

---

### Description

Returns variable name and descriptions for parameters returned by [echoWaterGetFacilityInfo](#)

### Usage

```
echoWaterGetMeta(verbose = FALSE)
```

### Arguments

verbose      Logical, indicating whether to provide processing and retrieval messages. Defaults to FALSE

### Value

returns a dataframe

### Examples

```
## These examples require an internet connection to run  
  
# returns a dataframe of  
echoWaterGetMeta()
```

---

echoWaterGetParams      *Search parameter codes for Clean Water Act permits on EPA ECHO*

---

### Description

Returns a dataframe of parameter codes and descriptions.

### Usage

```
echoWaterGetParams(term = NULL, code = NULL, verbose = FALSE)
```

**Arguments**

term	Character string specifying the parameter search term. Partial or complete search phrase or word.
code	Character string specifying the parameter search code value.
verbose	Logical, indicating whether to provide processing and retrieval messages. Defaults to FALSE

**Value**

Returns a dataframe.

**Examples**

```
## These examples require an internet connection to run

## Retrieve parameter codes for dissolved oxygen
echoWaterGetParams(term = "Oxygen, dissolved")

echoWaterGetParams(code = "00300")
```

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