

Package: mrwaste (via r-universe)

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Type Package

Title Analysis and Projection of Municipal Solid Waste

Version 0.4.4

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Description Reads in waste data from What a Waste 2.0 and uses brms package to create future regressions based on GDP.

License LGPL-3

Depends madrat(>= 1.30), magclass(>= 3.17), mrcommons, R(>= 2.10.0)

Imports alabama, brms, dplyr, magpiesets, magrittr, mstools, readxl, rlang, rstan, SPEI, tidyr, tidymodels, utils

Suggests covr

Encoding UTF-8

LazyData true

RoxygenNote 7.3.1

Repository <https://pik-piam.r-universe.dev>

RemoteUrl <https://github.com/pik-piam/mrwaste>

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calcIPCCClimateRegions
calcClimateRegionsIPCC

Description

calculates IPCC Climate Regions (IPCC2006 ch.4.3) based on t, ppt, pet from LPJml. elevation dimension not included for tropical montane class

Usage

```
calcIPCCClimateRegions(
  landusetypes = "all",
  cellular = FALSE,
  yearly = FALSE,
  convert = TRUE
)
```

Arguments

landusetypes	all or only one (to save computation memory)
cellular	FALSE for country level, TRUE for cells
yearly	FALSE for normal magpie 5 year time spans, TRUE for yearly
convert	fills missing countries for country level aggregation with warm temperate moist (mostly small island nations)

Value

Country or cellular magpie object with matrix of fraction of each climate region by country or cell

Author(s)

David Chen

Examples

```
## Not run:
calcOutput("IPCCClimateRegions")

## End(Not run)
```

calcNlWasteDistrib *calcNlWasteDistrib*

Description

non-linear optimization distributes waste by composition type to disposal type. returns magpie object, share of total disposal

Usage

```
calcNlWasteDistrib()
```

Value

Magpie object of waste types to waste distribution, share

Author(s)

David Chen

Examples

```
## Not run: a <- calcOutput(type="NlWasteDistrib")
```

calcOceanPlastic *calcOceanPlastic*

Description

Calculates amount of ocean plastic based on calibrated waste projections, for unmanaged waste: all dumps, landfills and dumps from developing countries, and 2 Coastal pop from Janbeck et al. 2016 buffer, as constant percentage future pop

Usage

```
calcOceanPlastic(filtration = 0.4)
```

Arguments

filtration amount of plastic NOT captured by filtration, janbeck uses 0.15, 0.25, 0.4, but cites a source at .6

Value

million kg of plastic waste

Author(s)

David Chen

`calcWasteDistrib` *calcWasteDistrib*

Description

rule-based distribution of waste by composition type to disposal type. returns list of magpie object, share of total disposal

Usage`calcWasteDistrib()`**Value**

Magpie object of waste types to waste distribution, percentage

Author(s)

David Chen

Examples

```
## Not run: a <- calcOutput(type="WasteDistrib")
```

`calcWasteEmissions` *calcWasteEmissions*

Description

Calculates GHG emissions from solid waste disposal treatments, input from calcWasteProjections, based on IPCC 2006 SWDS waste model and reporting calculations, in million t CO₂eq

Usage`calcWasteEmissions(treatment = "swds")`**Arguments**

treatment type of waste treatment

Value

Magpie object of emissions from waste treatments

Author(s)

David Chen

Examples

```
## Not run: a <- calcOutput(type="WasteEmissions")
```

`calcWasteGen` *calcWasteGen*

Description

Calculates waste generation based on WhataWaste2.0 data, based on gdp regressions and calibrated to real data multiplicatively

Usage

```
calcWasteGen(pc = TRUE, form = "LogLog")
```

Arguments

<code>pc</code>	per capita (kg/capita) or total (Mt)
<code>form</code>	Functional form of predicted waste generation

Value

magpie object of total waste generation

Author(s)

David Chen

`calcWasteProj` *calcWasteProj*

Description

Calculates all waste projections, multiplies shares properly by pc or total generation quantities

Usage

```
calcWasteProj(pc = TRUE, SSP = "SSP2")
```

Arguments

pc	per capita (kg/capita) or total (Mt) wet weight
SSP	SSP scenario

Value

magpie object of waste projections by treatment and type

Author(s)

David Chen

<i>calcWasteTrt</i>	<i>calcWasteDirTrt</i>
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Description

Calculates shares of waste treatments by type based on Dirichlet regression on gdp using WhataWaste2.0 data note that each type is independent - treatments for each type all sum to 1

Usage

```
calcWasteTrt(weight = "pop", SSP = "SSP2")
```

Arguments

weight	population weights or "none"
SSP	SSP scenario

Value

magpie object of waste treatment by type share

Author(s)

David Chen

calcWasteType *calcWasteType*

Description

Calculates shares of waste types based on Dirichlet regression on gdp using WhataWaste2.0 data

Usage

```
calcWasteType(weight = "pop", SSP = "SSP2")
```

Arguments

weight	population weights or other weights or NULL
SSP	SSP scenario

Value

magpie object of waste shares

Author(s)

David Chen

convertCoastalPop *convertCoastalPop*

Description

Fills and completes Janbeck 2011 coastal population data for all years based on constant percentage of coastal pop for future years

Usage

```
convertCoastalPop()
```

Value

pop in millions

Author(s)

David Chen

See Also

[readSource](#)

convertLandfillCH4Capture
Convert landfill CH4 capture data

Description

Convert landfill CH4 capture data

Usage

convertLandfillCH4Capture(x)

Arguments

x MAgPIE object containing original values

Value

DemandModel data as MAgPIE object aggregated to country level

Author(s)

David Chen

convertWaste *convertWaste*

Description

Converts readWaste output to complete MAgPIE object containing Waste data on country level (kg/cap)

Usage

convertWaste(subtype)

Arguments

subtype type of waste data, generation composition treatment or special

Value

Waste data as complete MAgPIE object on country level

Author(s)

David Chen

See Also

[readSource](#)

readCoastalPop *Read Janbeck 2011 Coastal Population data, for Ocean Plastic input*

Description

Read-in a xlsx file as magclass object kg/cap

Usage

```
readCoastalPop()
```

Value

magpie object of coastal population by country, 50km buffer around coastline, keeping percentage same in future

Author(s)

David Chen

See Also

[readSource](#)

Examples

```
## Not run: a <- readSource(type="CoastalPop")
```

readLandfillCH4Capture
readLandfillCH4Capture

Description

reads percentage of ch4 from landfills that is captured, from World Bank CURB Toolv2.1

Usage

```
readLandfillCH4Capture()
```

Value

Magpie object with results on global level.

Author(s)

David Chen

See Also

[readSource](#)

readWaste

Read WhataWaste2.0 World Bank data

Description

Read-in a xlsx file as magclass object kg/cap

Usage

```
readWaste(subtype)
```

Arguments

subtype data subtype. "Generation" "Composition" and "Treatment" in kg/capita

Value

magpie object of the WhataWaste data with Generation, Disposal, or Composition

Author(s)

David Chen

See Also

[readSource](#)

Examples

```
## Not run: a <- readSource(type="Waste", subtype="Generation")
```

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