Package: sfdSAR (via r-universe)

May 10, 2026

Title Functions to calculate Swept area ratio and Surface and subsurface abrasion from VMS data

Version 1.0.0

Description Functions to calculate Swept area ratio and Surface and subsurface abrasion from VMS data. The data is expected to conform to the ICES WGSFD data call format.

Depends R (>= 2.10)

Suggests icesVMS, dplyr, rmarkdown

Encoding UTF-8

LazyData true

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Roxygen list(markdown = TRUE)

RoxygenNote 7.2.3

Repository https://ices-tools-dev.r-universe.dev

Date/Publication 2023-09-27 14:46:27 UTC

RemoteUrl https://github.com/ices-tools-dev/sfdSAR

RemoteRef HEAD

RemoteSha c3da47adafddd26bafbb9c6263038e4389dd3660

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sfdSAR-package *Functions to calculate Swept area ratio and Surface and subsurface abrasion from VMS data*

Description

Functions to calculate Swept area ratio and Surface and subsurface abrasion from VMS data. The data is expected to conform to the ICES WGSFD data call format.

Author(s)

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References

ICES Working Group on Spatial Fisheries Data: http://www.ices.dk/community/groups/Pages/WGSFD.aspx.

csquare_utils *Get information related to a C-Square*

Description

Extract the surface area, latitude or longitude of a 0.05 resolution C-Square.

Usage

```
csquare_area(csquare)

csquare_lat(csquare)

csquare_lon(csquare)
```

Arguments

csquare	the name of a 0.05 resolution C-Square.

Value

A vector of numeric values: latitudes, longitudes or areas.

Examples

```
csquare_area("1501:370:370:1")
csquare_lat("1501:370:370:1")
csquare_lon("1501:370:370:1")
```

gear_models *Gear width models*

Description

Predict the gear with of a fishing gear from its benthis classification.

Usage

```
linear(firstFactor, secondFactor, x)

power(firstFactor, secondFactor, x)
```

Arguments

firstFactor	the 'first' parameter for the model
secondFactor	the 'second' parameter for the model
x	the covariate used in the model: avg_oal (average overall length) or avg_kw (average kilo-wats engine power)

Value

A vector of predicted gear widths.

Examples

```
linear(1, 1, 1)
```

predict_gear_width *Calculate gear width from vessel characteristics*

Description

Predict gear width using vessel length or engine size.

Usage

```
predict_gear_width(model, coefficient, data)
```

Arguments

model	vector of characters defining a model (see ?linear or ?power)
coefficient	coefficient names, must be columns names in data
data	a data.frame with the columns, a, b, model, .

Value

A vector of predicted gear widths.

Examples

```
# very simple example of how to apply this helper function
predict_gear_width("power", "avg_aol", data.frame(firstFactor = 1, secondFactor = 1, avg_aol = 1))

# use the dummy vms dataset
data(test_vms)


# get gear widths and metier lookup from ICES DB
library(icesVMS)
metier_lookup <- get_metier_lookup()
gear_widths <- get_benthis_parameters()

# join widths and lookup
library(dplyr)
aux_lookup <-
  gear_widths %>%
  right_join(metier_lookup, by = c("benthisMet" = "benthisMetiers"))

# add aux data to vms
vms <-
  aux_lookup %>%
  right_join(test_vms, by = c("leMetLevel6" = "LE_MET_level6"))

# calculate the gear width model
vms$gearWidth_model <-
  predict_gear_width(vms$gearModel, vms$gearCoefficient, vms)
```

`predict_surface_contact` *Calculate surface contact*

Description

Predict surface contact.

Usage

```
predict_surface_contact(model, fishing_hours, gear_width, fishing_speed)
```

Arguments

model	vector of characters defining a model (see ?surface_contact_models)
fishing_hours	the total number of hours fished.
gear_width	the average gear width.
fishing_speed	the average fishing speed.

Value

A vector of predicted gear widths.

Examples

```
# compute surface contact for a trawl gear, fishing for 1 hour, with
# a 85 metres trawl width, at 3 knots.
predict_surface_contact("trawl_contact", 1, 85, 3)
```

---

surface_contact_models

Surface contact models

Description

Predict the surface contact of a fishing gear

Usage

```
trawl_contact(fishing_hours, gear_width, fishing_speed)

danish_seine_contact(fishing_hours, gear_width, fishing_speed)

scottish_seine_contact(fishing_hours, gear_width, fishing_speed)
```

Arguments

fishing_hours	the number of hours of fishing
gear_width	(average) gear width in metres
fishing_speed	(average) fishing speed in knots

Value

A vector of predicted gear widths.

Examples

```
# compute surface contact for a trawl gear, fishing for 1 hour, with
# a 85 metres trawl width, at 3 knots.
trawl_contact(fishing_hours = 1,
              gear_width = 85,
              fishing_speed = 3)
```

`test_vms` *Lookup table to aggregate metier level 6 gear groupings*

Description

A table.

Usage

```
test_vms
```

Format

Data frame with containing 17 columns:

recordtype	Metier level 6 gear code
country	Benthis metier used to define bottom fishing pressure
year	Metier level 5 gear codes
month	Metier level 5 gear codes
c_square	JNCC gear groupings
vessel_length_category	Vessel length category
gear_code	Text description of the gear code
LE_MET_level6	Metier level 6 gear code
avg_fishing_speed	description ...
fishing_hours	description ...
avg_oal	description ...
avg_kw	description ...
kw_fishinghours	description ...
totweight	description ...
totvalue	description ...
ICES_avg_fishing_speed	description ...
avg_gearWidth	description ...

Details

Copmletely made up VMS data to allow SAR functions to be demonstrated.

Source

Reference to ices data call and format?

See Also

sfdSAR-package gives an overview of the package.

Examples

```
head(test_vms)
```

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