

Package: TrackTrap (via r-universe)

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Title Model Cumulative Growing Degree-Days for Pest Monitoring

Version 0.1.0

Description Raw data from pest monitoring/traps can be correlated with environmental factors such as temperature, growing degree day etc. to get useful insights about the pest phenology. This package pulls temperature data from the California Irrigation Management Information System ('CIMIS', <https://cimis.water.ca.gov>) or the 'Daymet' application programming interface ('API', <https://daymet.ornl.gov>) for a user-specified time period and calculates cumulative growing degree-days. Users provide pest development thresholds (lower and upper temperatures) and the geographic coordinates of the trap location to track emergence and phenology.

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Encoding UTF-8

RoxygenNote 7.3.3

Depends R (>= 3.5)

LazyData true

Imports daymetr, degday, dplyr, ggplot2, magrittr, rlang

NeedsCompilation no

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calc_pest_phenology	<i>Calculate cumulative degree-days for a pest using Daymet API or CIMIS CSV FILE</i>
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Description

Calculate cumulative degree-days for a pest using Daymet API or CIMIS CSV FILE

Usage

```
calc_pest_phenology(
  trap_data,
  pest = NULL,
  lat = NULL,
  lon = NULL,
  custom_lower = NULL,
  custom_upper = NULL,
  cimis_csv = NULL
)
```

Arguments

trap_data	A data frame containing date and trap_counts.
pest	A string representing the pest code (e.g., "OLFF", "NOW"). See pest_thresholds dataset.
lat	Latitude of the trap location (numeric).
lon	Longitude of the trap location (numeric).
custom_lower	Optional. Override the database with a custom lower threshold.
custom_upper	Optional. Override the database with a custom upper threshold.
cimis_csv	Optional. File path to a manually downloaded CIMIS daily CSV file.

Value

A data frame joining the trap data with daily temperatures and cumulative degree-days.

Examples

```
# Create mock trap data for testing
trap_df <- data.frame(date = as.Date(c("2024-05-01", "2024-05-08")),
                      trap_counts = c(2, 14))

# Calculate phenology using Daymet API
results <- calc_pest_phenology(trap_df, pest = "OLFF", lat = 38.5, lon = -121.8)
```

pest_thresholds *Pest Developmental Thresholds*

Description

A dataset containing the lower and upper developmental temperature thresholds (in Fahrenheit) for common agricultural pests in California.

Usage

```
pest_thresholds
```

Format

A data frame with 5 rows and 4 variables:

pest_code Short abbreviation for the pest (e.g., OLFF, NOW)

pest_name Common name of the pest

lower_thresh Lower developmental temperature threshold (°F)

upper_thresh Upper developmental temperature threshold (°F)

plot_phenology_trend *Plot Cumulative Degree-Days against Trap Counts*

Description

Plot Cumulative Degree-Days against Trap Counts

Usage

```
plot_phenology_trend(df, save_plot = FALSE)
```

Arguments

df The data frame outputted by calc_pest_phenology.

save_plot Logical. If TRUE, saves the plot to your working directory.

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plot_phenology_trend

Value

A ggplot object.

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