Automating the annotation and stacking of JV rasters

Mannfred Masahiro Asada Boehm

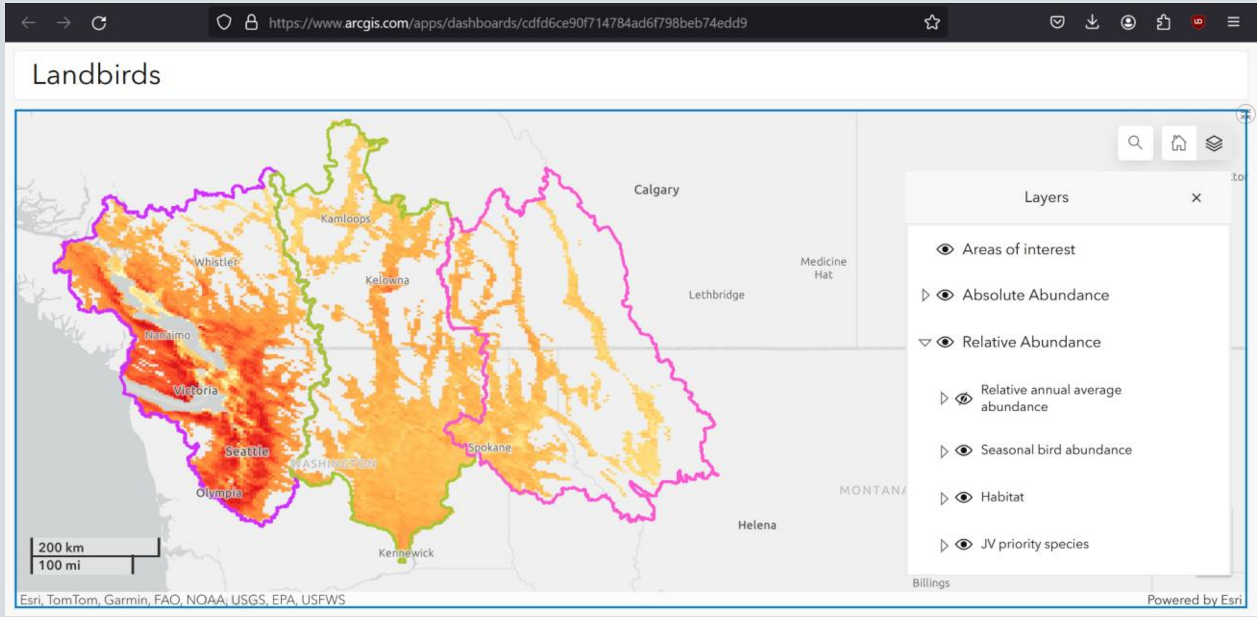
Impact Assessment Fellow

Boreal Avian Modelling Project, UofA

Problems:

(1) How can we efficiently attach ecological and management data to rasters scattered across multiple folders?

(2) How can we automate the sorting of these raster data by ecological or management variables of interest?



Lili Simon, Devin de Zwaan

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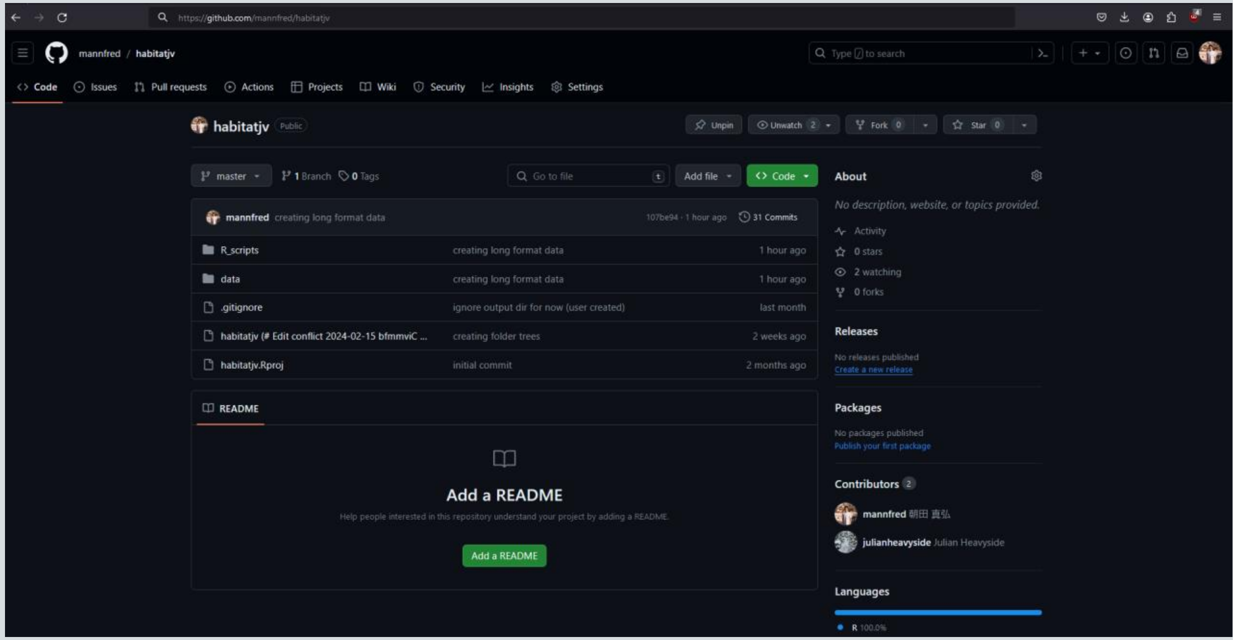


mannfred creating long format data 107be94 · 1 hour ago 31 Commits

R_scripts	creating long format data	1 hour ago
data	creating long format data	1 hour ago
.gitignore	ignore output dir for now (user created)	last month
habitatjv (# Edit conflict 2024-02-15 bfmmviC ...	creating folder trees	2 weeks ago
habitatjv.Rproj	initial commit	2 months ago

Add a README

Help people interested in this repository understand your project by adding a README.

About

No description, website, or topics provided.

Releases

No releases published

Packages

No packages published

Contributors 2

mannfred 朝田 真弘

julianheavyside Julian Heavyside

Languages

R 100.0%

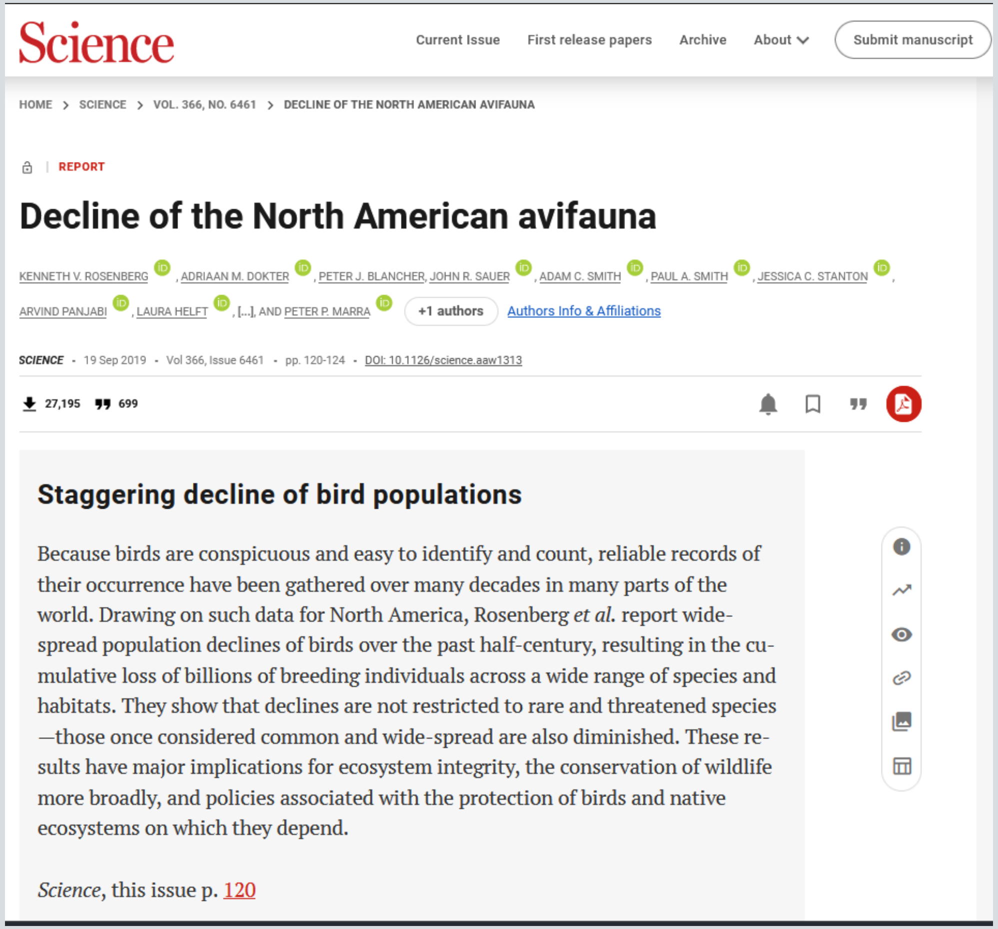
github.com/mannfred/habitatjv

Problems:

(1) How can we efficiently attach ecological and management data to raster files scattered across multiple folders?

> sourcing ecological data from Rosenberg et al (2019) *Science*

> `joining` to JV abundance data



HOME > SCIENCE > VOL. 366, NO. 6461 > DECLINE OF THE NORTH AMERICAN AVIFAUNA

REPORT

Decline of the North American avifauna

KENNETH V. ROSENBERG, ADRIAAN M. DOKTER, PETER J. BLANCHER, JOHN R. SAUER, ADAM C. SMITH, PAUL A. SMITH, JESSICA C. STANTON, ARVIND PANJABI, LAURA HELFT, [...], AND PETER P. MARRA +1 authors Authors Info & Affiliations

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27,195 699

Staggering decline of bird populations

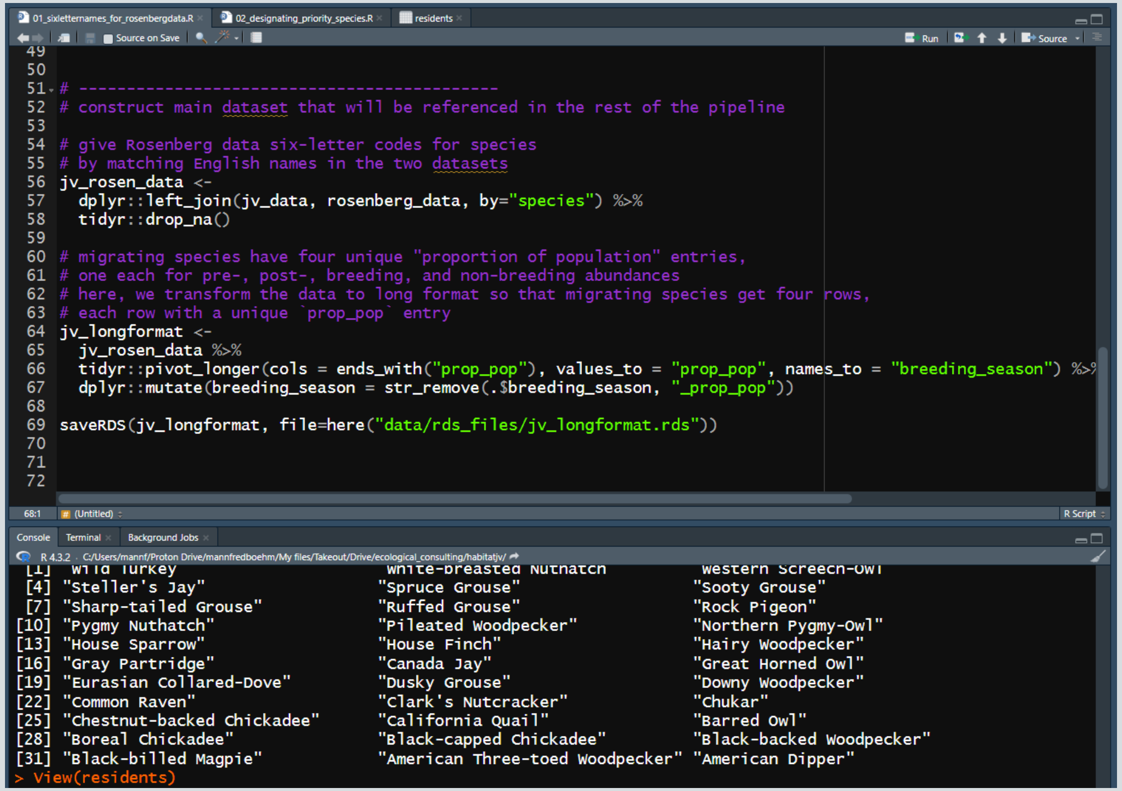
Because birds are conspicuous and easy to identify and count, reliable records of their occurrence have been gathered over many decades in many parts of the world. Drawing on such data for North America, Rosenberg *et al.* report widespread population declines of birds over the past half-century, resulting in the cumulative loss of billions of breeding individuals across a wide range of species and habitats. They show that declines are not restricted to rare and threatened species—those once considered common and wide-spread are also diminished. These results have major implications for ecosystem integrity, the conservation of wildlife more broadly, and policies associated with the protection of birds and native ecosystems on which they depend.

Science, this issue p. 120

Problems:

(1) How can we efficiently attach ecological and management data to raster files scattered across multiple folders?

> generating a long format `data.frame` that treats breeding season as an observation of the smallest sampling unit (species)


01_sixletternames_for_rosenbergdata.R
02_designating_priority_species.R
residents
Source on Save
Run
Source
68:1
(Untitled)
R Script
Console
Terminal
Background Jobs
R 4.3.2 · C:/Users/mannf/Proton Drive/mannfredboehm/My files/Takeout/Drive/ecological_consulting/habitatjv/

```r


# ---------------------------------------------
# construct main dataset that will be referenced in the rest of the pipeline

# give Rosenberg data six-letter codes for species
# by matching English names in the two datasets
jv_rosen_data <-
  dplyr::left_join(jv_data, rosenberg_data, by="species") %>%
  tidyr::drop_na()

# migrating species have four unique "proportion of population" entries,
# one each for pre-, post-, breeding, and non-breeding abundances
# here, we transform the data to long format so that migrating species get four rows,
# each row with a unique `prop_pop` entry
jv_longformat <-
  jv_rosen_data %>%
  tidyr::pivot_longer(cols = ends_with("prop_pop"), values_to = "prop_pop", names_to = "breeding_season") %>%
  dplyr::mutate(breeding_season = str_remove(.$breeding_season, "_prop_pop"))

saveRDS(jv_longformat, file=here("data/rds_files/jv_longformat.rds"))
```

```
 [1] "Wild Turkey"                  "White-breasted Nuthatch"        "Western Screech-Owl"
 [4] "Steller's Jay"                "Spruce Grouse"                  "Sooty Grouse"
 [7] "Sharp-tailed Grouse"          "Ruffed Grouse"                  "Rock Pigeon"
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[28] "Boreal Chickadee"             "Black-capped Chickadee"         "Black-backed Woodpecker"
[31] "Black-billed Magpie"          "American Three-toed Woodpecker" "American Dipper"
> View(residents)
```

Problems:

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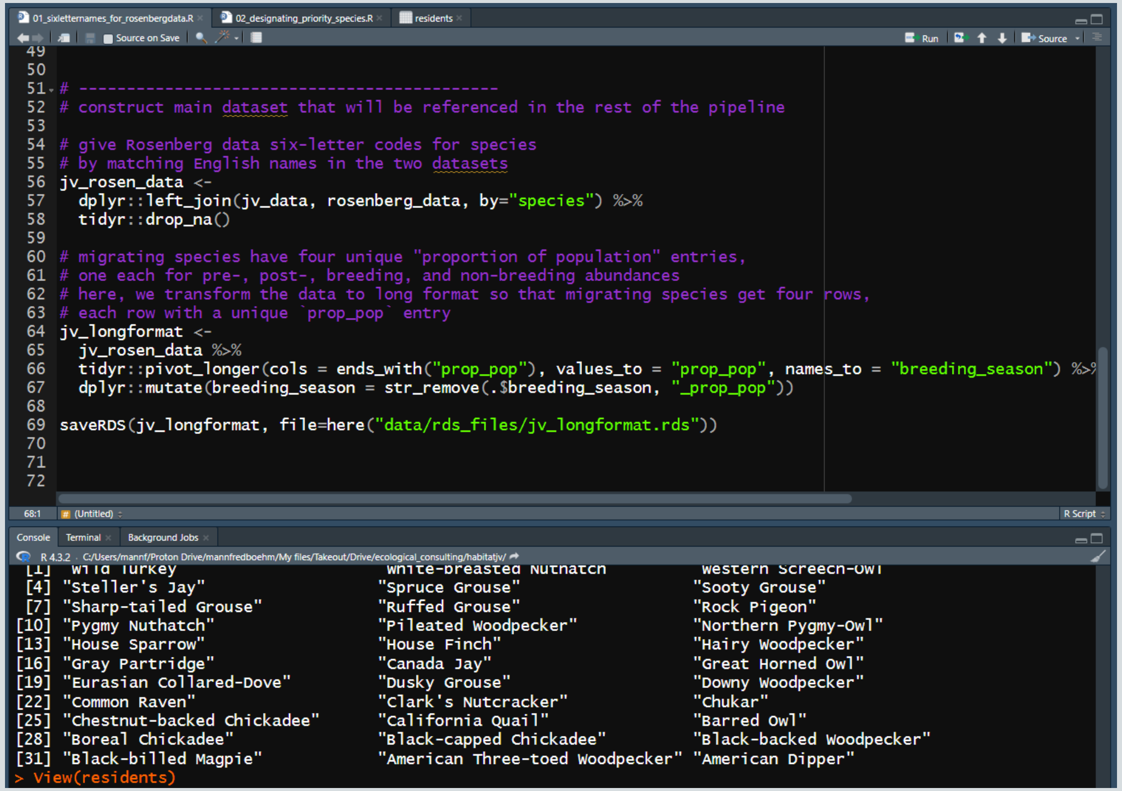
> assigning stewardship responsibility (logical) to each observation (row) using a threshold of >0.90 proportion of global population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saveRDS(jv_longformat, file=here("data/rds_files/jv_longformat.rds"))
```

```
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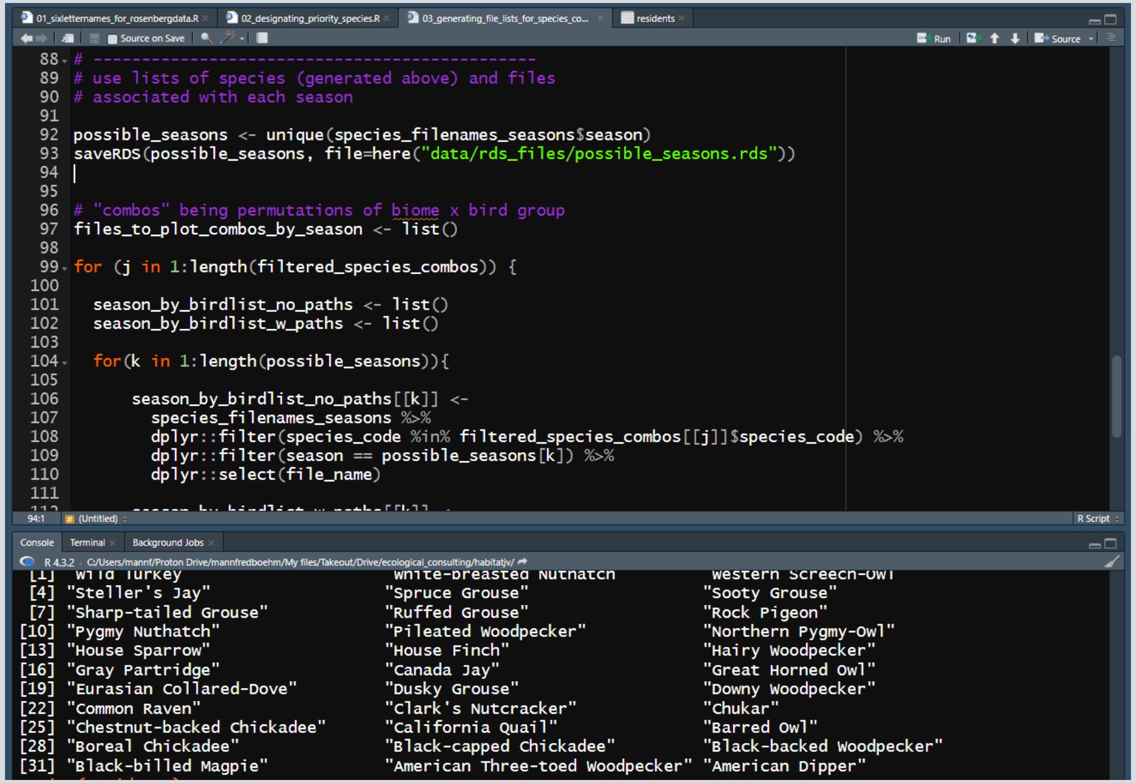
```

Problems:

(2) How can we automate the sorting of these raster data by ecological or management variables of interest?

> generating lists of file paths that capture every permutation of the variables of interest (breeding biome, bird group, stewardship responsibility, JV, etc.)



01_sixletternames_for_rosenbergdata.R
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```r
# ---------------------------------------------
# use lists of species (generated above) and files
# associated with each season

possible_seasons <- unique(species_filenames_seasons$season)
saveRDS(possible_seasons, file=here("data/rds_files/possible_seasons.rds"))


# "combos" being permutations of biome x bird group
files_to_plot_combos_by_season <- list()

for (j in 1:length(filtered_species_combos)) {

  season_by_birdlist_no_paths <- list()
  season_by_birdlist_w_paths <- list()

  for(k in 1:length(possible_seasons)){

      season_by_birdlist_no_paths[[k]] <-
        species_filenames_seasons %>%
        dplyr::filter(species_code %in% filtered_species_combos[[j]]$species_code) %>%
        dplyr::filter(season == possible_seasons[k]) %>%
        dplyr::select(file_name)

      season_by_birdlist_w_paths[[k]] <-
```

```
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```
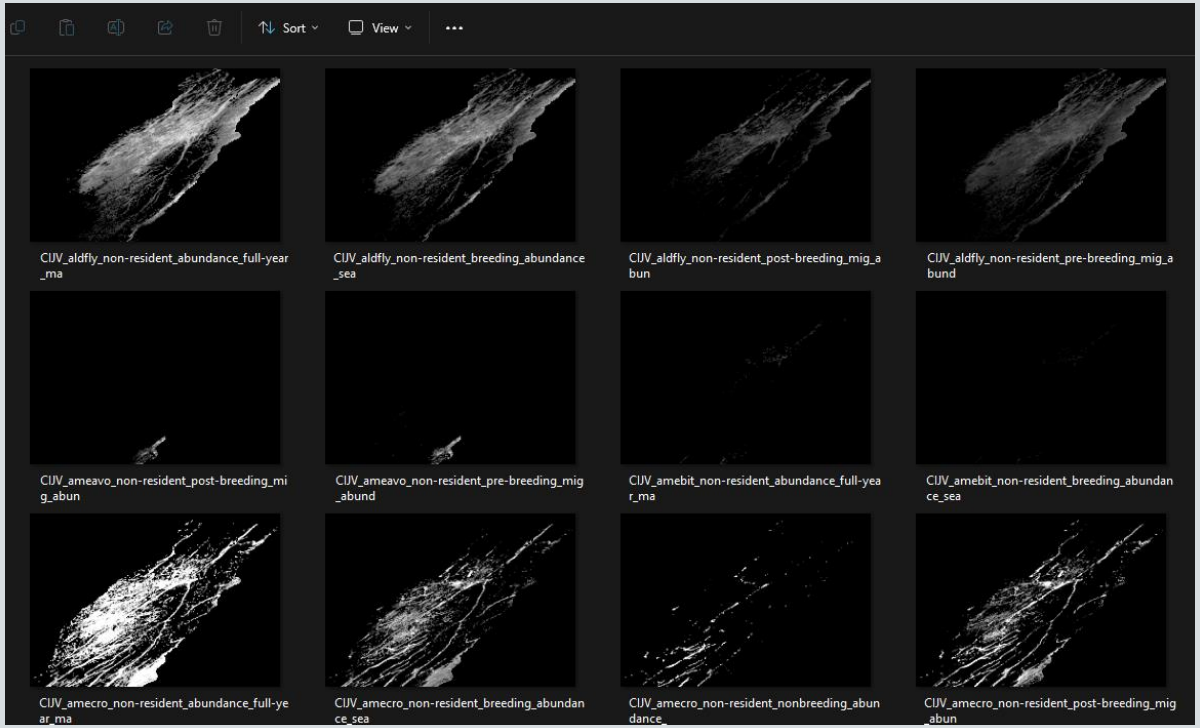

Problems:

(2) How can we automate the sorting of these raster data by ecological or management variables of interest?

> generating a local folder tree that can house the sorted data, and automating the copying of the right files to the right folders


Sort
View
···
CIJV_aldfly_non-resident_abundance_full-year_ma
CIJV_aldfly_non-resident_breeding_abundance_sea
CIJV_aldfly_non-resident_post-breeding_mig_abun
CIJV_aldfly_non-resident_pre-breeding_mig_abund
CIJV_ameavo_non-resident_post-breeding_mig_abun
CIJV_ameavo_non-resident_pre-breeding_mig_abund
CIJV_amebit_non-resident_abundance_full-year_ma
CIJV_amebit_non-resident_breeding_abundance_sea
CIJV_amecro_non-resident_abundance_full-year_ma
CIJV_amecro_non-resident_breeding_abundance_sea
CIJV_amecro_non-resident_nonbreeding_abundance_
CIJV_amecro_non-resident_post-breeding_mig_abun

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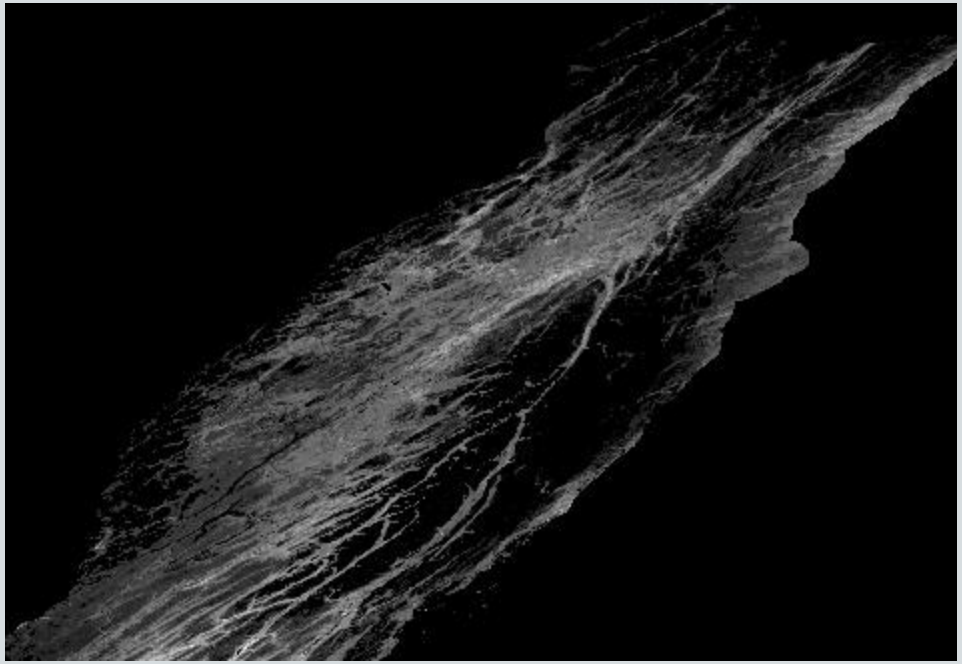
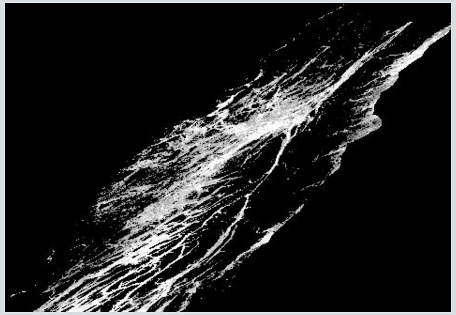
> `CIJV` &`Forest_Generalist` & `landbird`& `Resident` & `seasonal_mean`

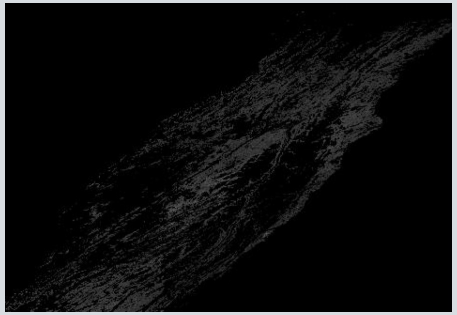
> 7 spp: dowwoo, haiwoo, rufgro, whbnut, ...



bkcchi



brdowl



wiltur