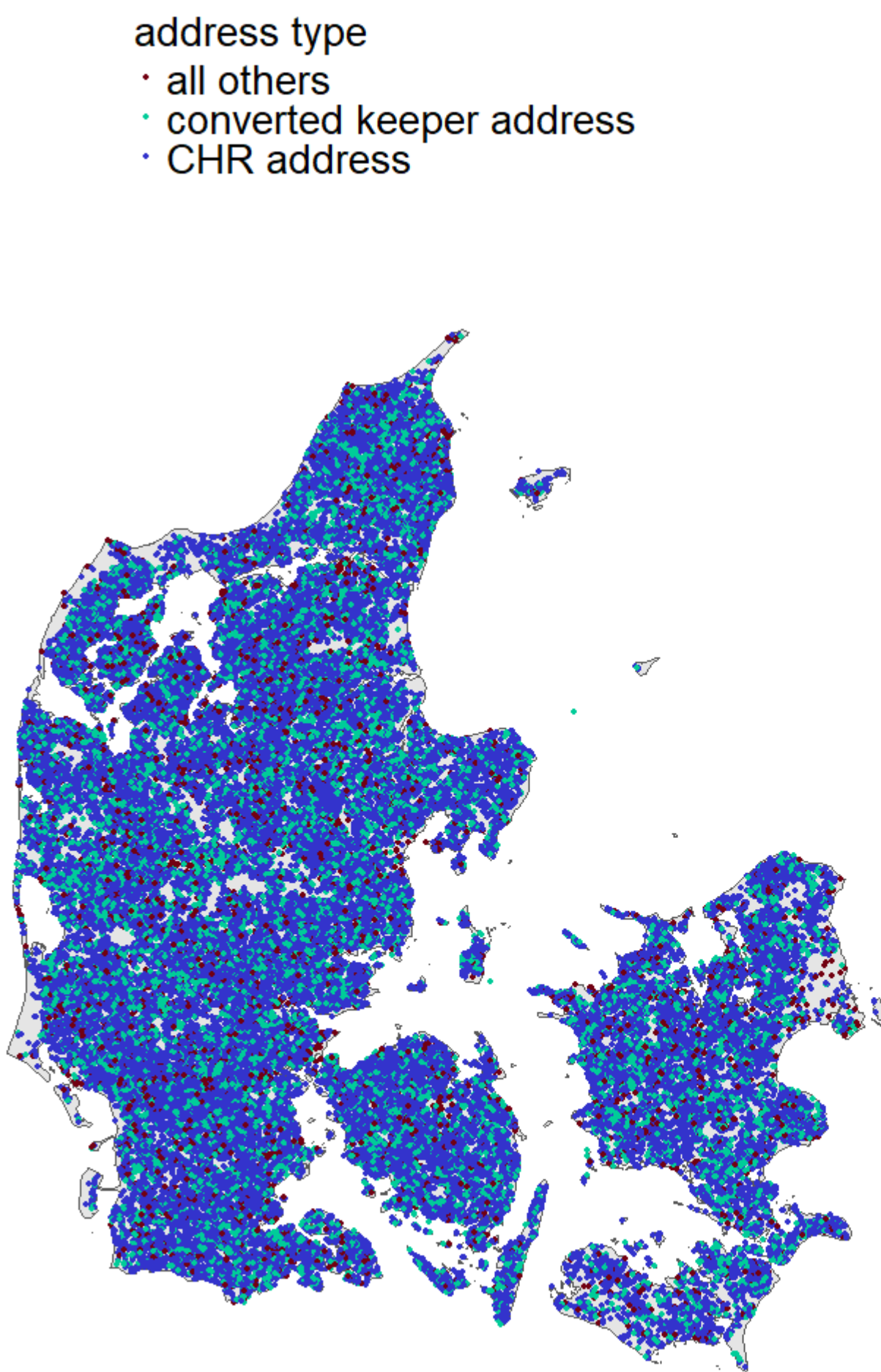


Schrödinger's cows – defining herd locations in Denmark

Maya Gussmann, Søren Saxmose Nielsen, Matt Denwood
Section of Animal Health and Welfare
makg@sund.ku.dk

The Danish Central Husbandry Register (CHR)

- Established in 1993
- Contains registrations of herds of various types and animal species
- Registered data include
 - Animal species
 - Number of animals
 - Date of registration
 - Closing date
 - Owner
 - Keeper (if someone else looks after the animals)
 - Coordinates



Address and coordinate types

Address types

| | |
|--------------------------------|-------|
| - Farm address | 90903 |
| - Owner's shipping address | 1626 |
| - Owner's provisional address | 9210 |
| - Converted user address | 39546 |
| - Keeper's shipping address | 7243 |
| - Keeper's provisional address | 5722 |
| - Financial address | 1972 |

Coordinate types

- Coordinates from address
- Animal location (manually entered)

Cattle farms in numbers (May 2024)

90903 herds, of which **4916** closed before 1993
76373 farms, of which **4886** closed before 1993
14918 active herds
14061 active farms
Oldest registration from **April 1982**

42863 herds with farm address only
32469 herds with 2 addresses
13986 herds with 3 addresses
1466 herds with 4 addresses
115 herds with 5 addresses
4 herds with 6 addresses

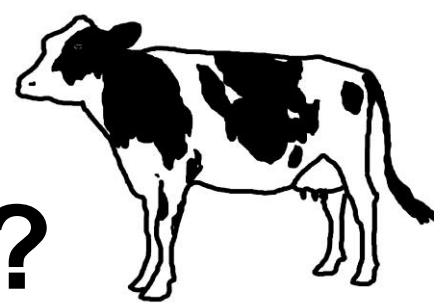
61613 addresses with 1 herd
8363 addresses with 2 herds
1766 addresses with 3 herds
758 addresses with more than 3 herds
Maximum number of herds per address: **3702**

70839 addresses with 1 farm
885 addresses with 2 farms
38 addresses with 3 farms
8 addresses with more than 3 farms

156222 herd-address-combinations registered

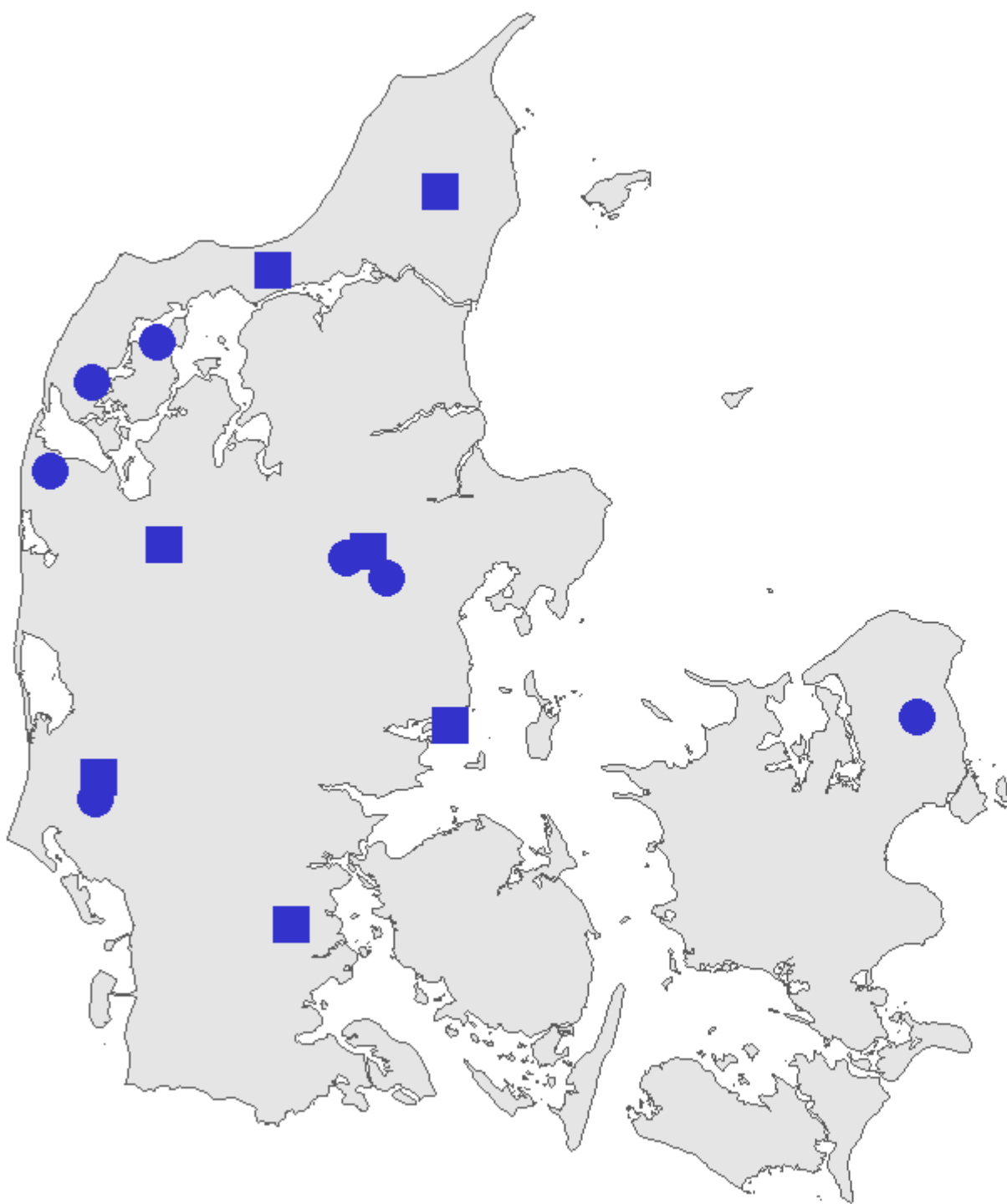
4802 herds without any address coordinates across all address types (**606** active)
3364 herds without any animal locations across all address types (**0** active)

So where are the cows...?



- Farm address
- Converted keeper address

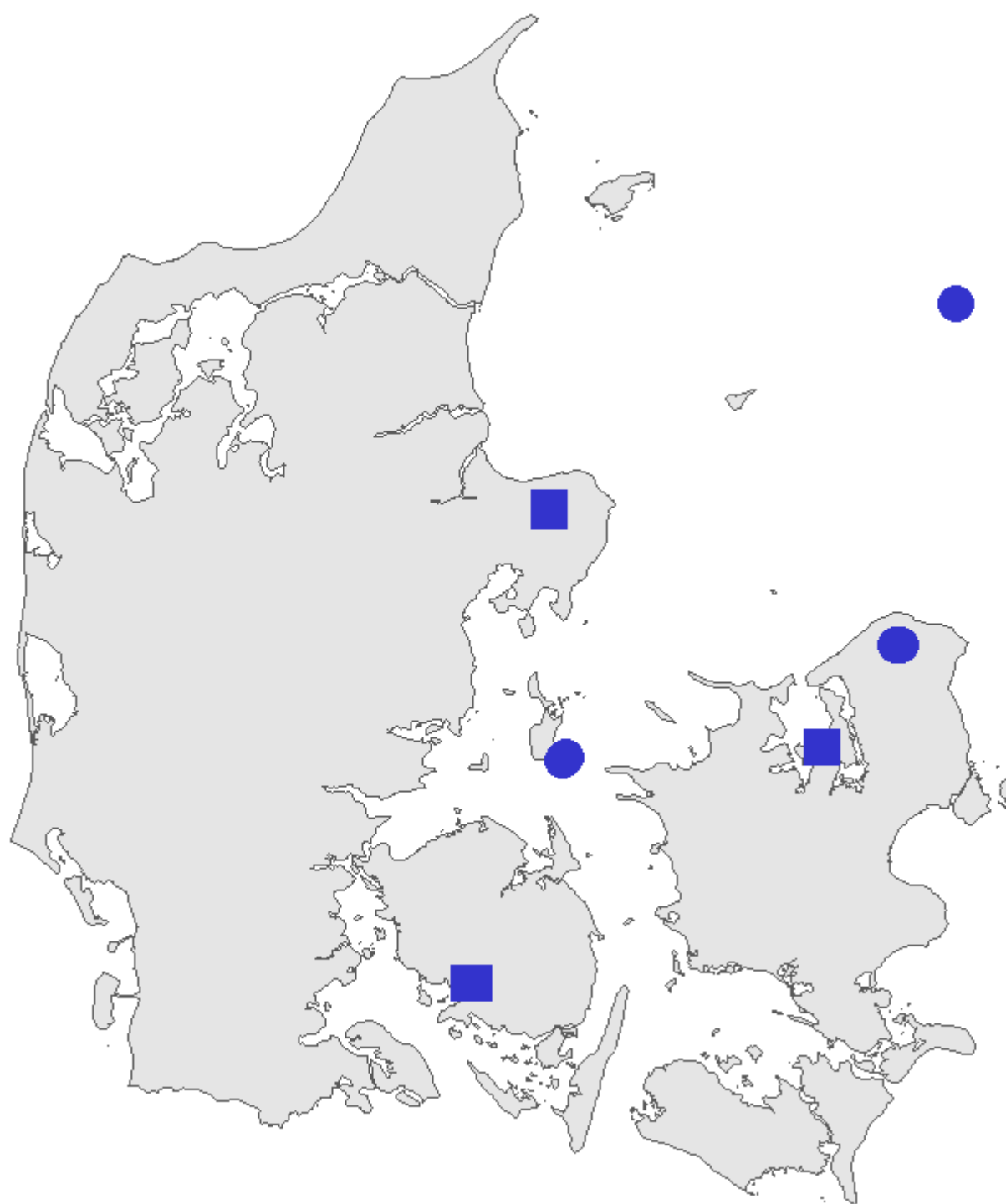
Figure. Approximate animal locations for farm addresses and converted keeper addresses of herds with a distance of more than 50 km.



There are **35890** herds with valid animal locations for both farm address and converted keeper address. **268** of those have a positive distance, ranging from **0.95 m** to **137.5 km**, with a median of **~55 m** and a 95th percentile of **8.8 km**.

- Animal location
- Address coordinates

Figure. Approximate address coordinates and animal locations with a distance of more than 50 km for a herd-address combination.



140927 herd-address-combinations have both address coordinates and animal locations registered. The distance between these coordinate types ranges from **0 m** to **161.6 km**, with a median of **~23 m** and a 95th percentile of **~70 m**.

Conclusion

Defining animal locations based on register data is not easy, as registrations can be ambiguous.

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