VERMONT

AGENCY OF AGRICULTURE, FOOD & MARKETS

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Apiary Program Update
AIB presentation
March 24, 2025

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Presentation Overview

- Apiary Program
- Vermont Beekeeping
- 3036 Pollinator Health Study
- Future Initiatives

Title 6: Agriculture

Chapter 172: Inspection of Apiaries

Apiary Program

- Registration
- Colony Inspections
- Interstate certificates
- 3036- Monitoring of Pollinator Health

Apiary Registration

- **Annual registration**
- Required for all colonies
  - $10 fee per apiary

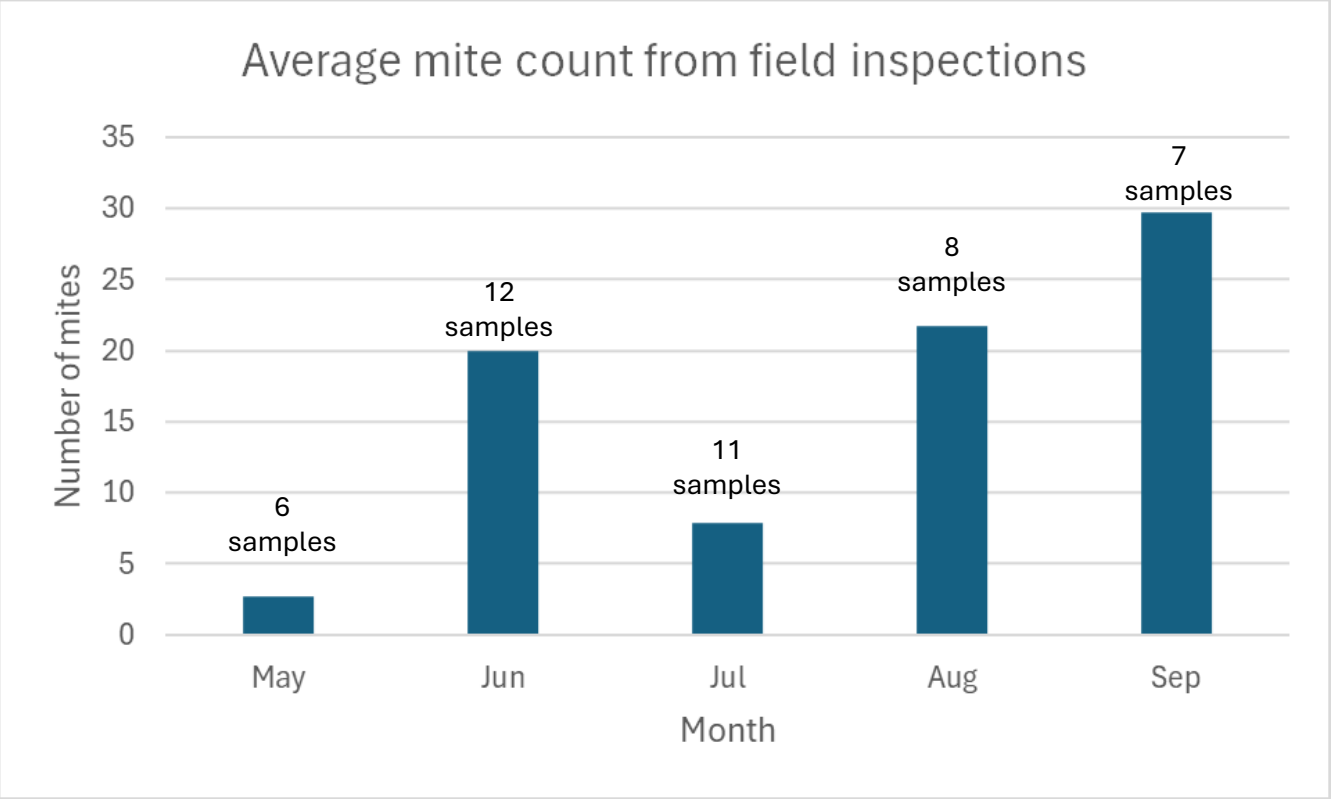
Apiary location data used for

- **Regulatory**
  - Commercial apiary restrictions
  - Inspections
- **Emergencies**
  - Notification of disease
  - Invasive pests
  - Other

Inspections

- Colony Health
  - Brood Diseases
  - Pests & Parasites
- Regulatory
  - Interstate travel
  - Sale of bees
- Management Advice

Varroa Mite counts 2024



Mite levels <3% are associated with healthier colonies and overwintering success

Vermont Beekeeping

Table 1. Colonies and apiaries registered with VAAFM, 2020-2024

Year	Number of colonies	Number of apiaries
2020	14,845	1,263
2021	15,110	1,251
2022	14,695	1,203
2023	17,145	1,213
2024	18,013	1,156

Number of Beekeepers and operation size

Table 2. Number of colonies managed by operation size, 2023-2024

	Number of individual beekeepers		Total number of colonies managed	
	2023	2024	2023	2024
Backyard operations managing <20 colonies	608	553	2,149	2,095
Sideliner operations managing 20-99 colonies	40	44	1,457	1,773
Commercial operations managing 100+ colonies	22	20	13,539	14,145

617 Registered Beekeepers
Managing 18,013 colonies in 2024

2023-2024 Winter Colony Loss

Table 3. Breakdown of colony loss by operation size

Operation size	Colonies at start	% colonies lost	% loss range	Median %
Backyard	1,412	50.2	0-100	50
Sideliner	1,949	37.15	0-100	33
Commercial in-state	3,648	37	9-60	31
Commercial migratory	2,400	3.95	2-8	5
All	9,409	30.6	0-100	50

§ 3036. Monitoring of Pollinator Health

§ 3036. Monitoring of pollinator health

The Secretary of Agriculture, Food and Markets shall monitor managed pollinator health to establish pollinator health benchmarks for Vermont, including:

(1) presence of pesticides in hives;

(2) mite pressure;

(3) disease pressure;

(4) mite control methods;

(5) genetic influence on survival;

(6) winter survival rate; and

(7) forage availability. (Added 2021, No. 145 (Adj. Sess.), § 3, eff. July 1, 2022.)

3036 Design

6 enrolled Apiaries

Representing different operation sizes and regions

Monthly sampling May-September

Pollen-pesticides and botanical ID

Bees-Mites and pathogens

Presence of Pesticides in Hives

Pollen Traps- Fresh pollen as bees enter hive

Samples sent to lab for analysis

- Qsi- 2023
- USDA- 2024

2023 Pollen Pesticide results

- 8 pollen samples from 3 locations
- 5 samples had levels at or above (LOQ) of .01 ppb
- 3 different pesticides were detected and quantified
- Deet, Icaridin, and Bifenthrin
- 4 of samples had pesticide residues at levels below the LOQ
- 1 sample had levels of a pesticide (Bifenthrin), classified as highly toxic to bees, at levels higher than the LD50
- 3 samples showed levels of pesticides classified as non-toxic to bees

2024 Pollen Pesticide results

- Results pending…

2023 Mite Pressure

32 mite counts

5 (or 15%) had levels of infestation at or above the standard economic threshold of <3%.

Studies show that colonies with infestation levels at or above this rate have an increased mortality rate, especially during the winter months.

2024 Mite Pressure

44 mite counts

9 (or 20%) had levels of infestation at or above the standard economic threshold of <3%.

Studies show that colonies with infestation levels at or above this rate have an increased mortality rate, especially during the winter months.

2023 Disease Pressure

	ABPV	**AFB**	***A.* woodi**	**DWV-A**	**DWV-B**	**DWV-C**	**EFB**	***N.* apis**	***N.* ceranae**
Positive Detections	9	0	3	12	20	0	6	0	17
Detection Rate % Detections (t)/number of samples (N)	24	0	8	32	53	0	16	0	45

2024 Disease Pressure

	ABPV	AFB	A. woodi	DWV-A	DWV-B	DWV-C	EFB	N. apis	N. ceranae
Positive Detections	3	0	3	8	26	0	2	0	15
Detection Rate % Detections (t)/number of samples (N)	7	0	7	19	62	0	5	0	36

2023 Mite Control Methods

4 of the **6** beekeepers use at least one miticide when mite infestation levels reach the 3% infestation threshold.

2 of the **6** beekeepers use “treatment-free” management practices where no miticides are used to manage varroa mites.

2024 Mite Control Methods

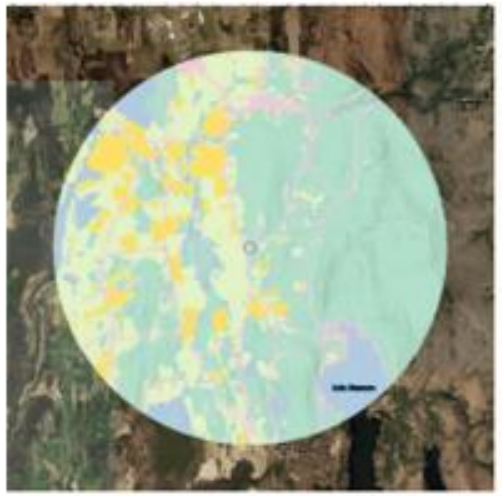
5 of the **6** beekeepers report using at least one miticide when mite infestation levels reach the **3%** infestation threshold.

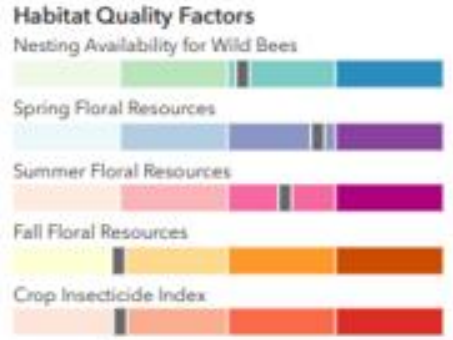
1 of the **6** will use a miticide if mite infestation levels reach well above the 3% threshold

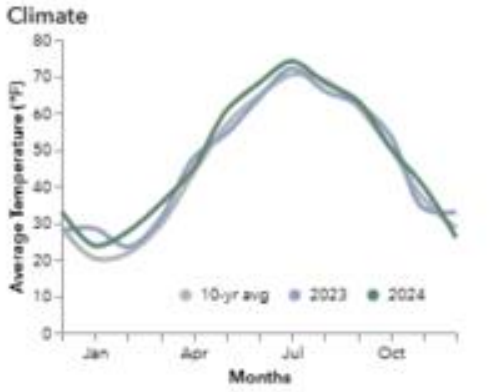
Forage Availability

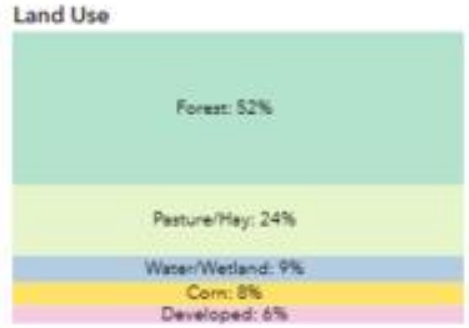
Apiary plotted into the Beescape Application

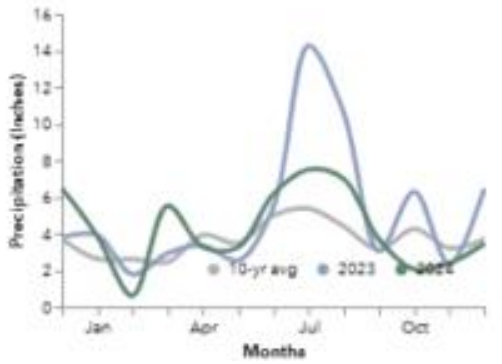
- 3-mile radius
- Economic Value
- Habitat Quality Factors
- Land Use
- Climate
- Precipitation

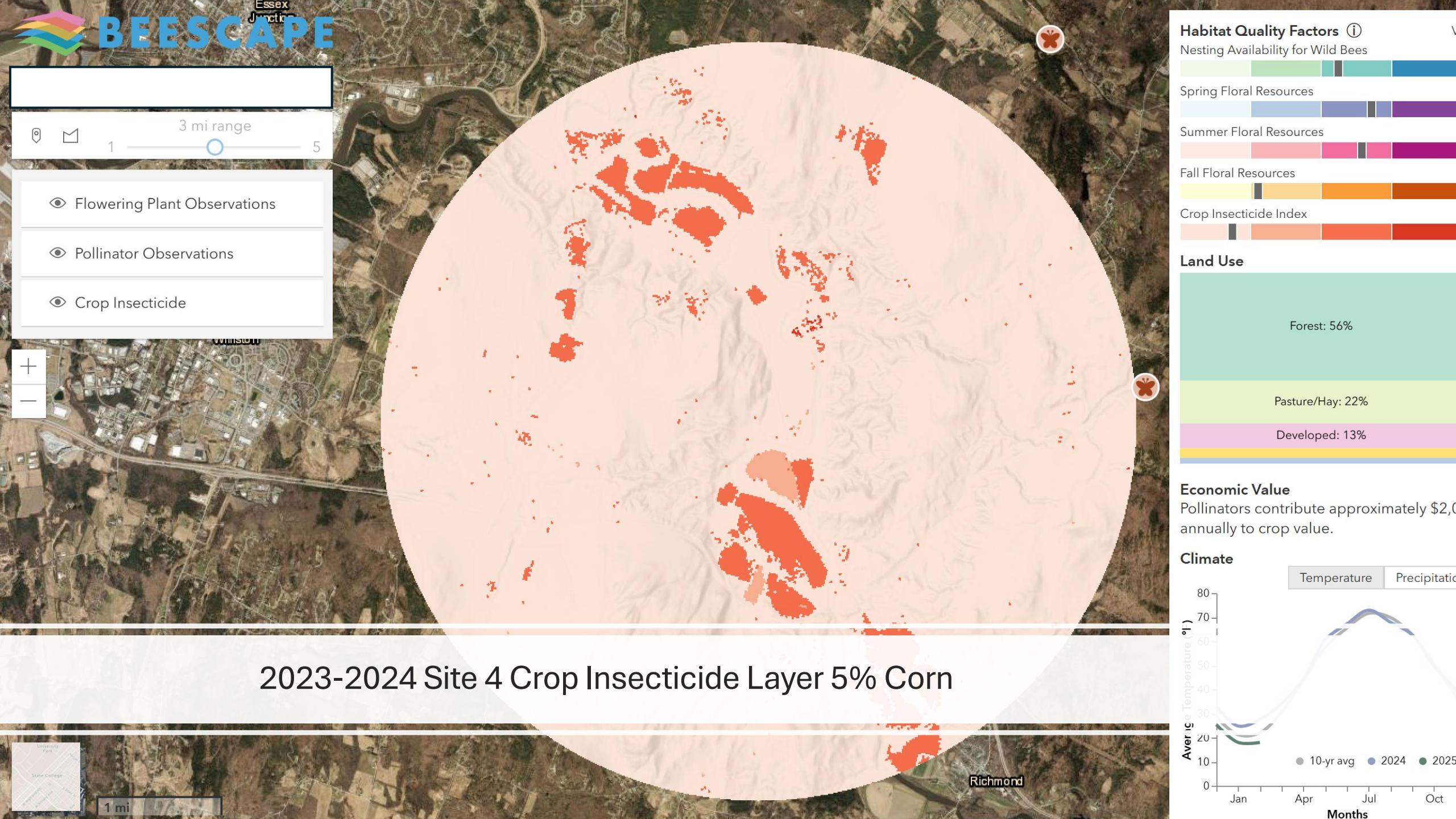




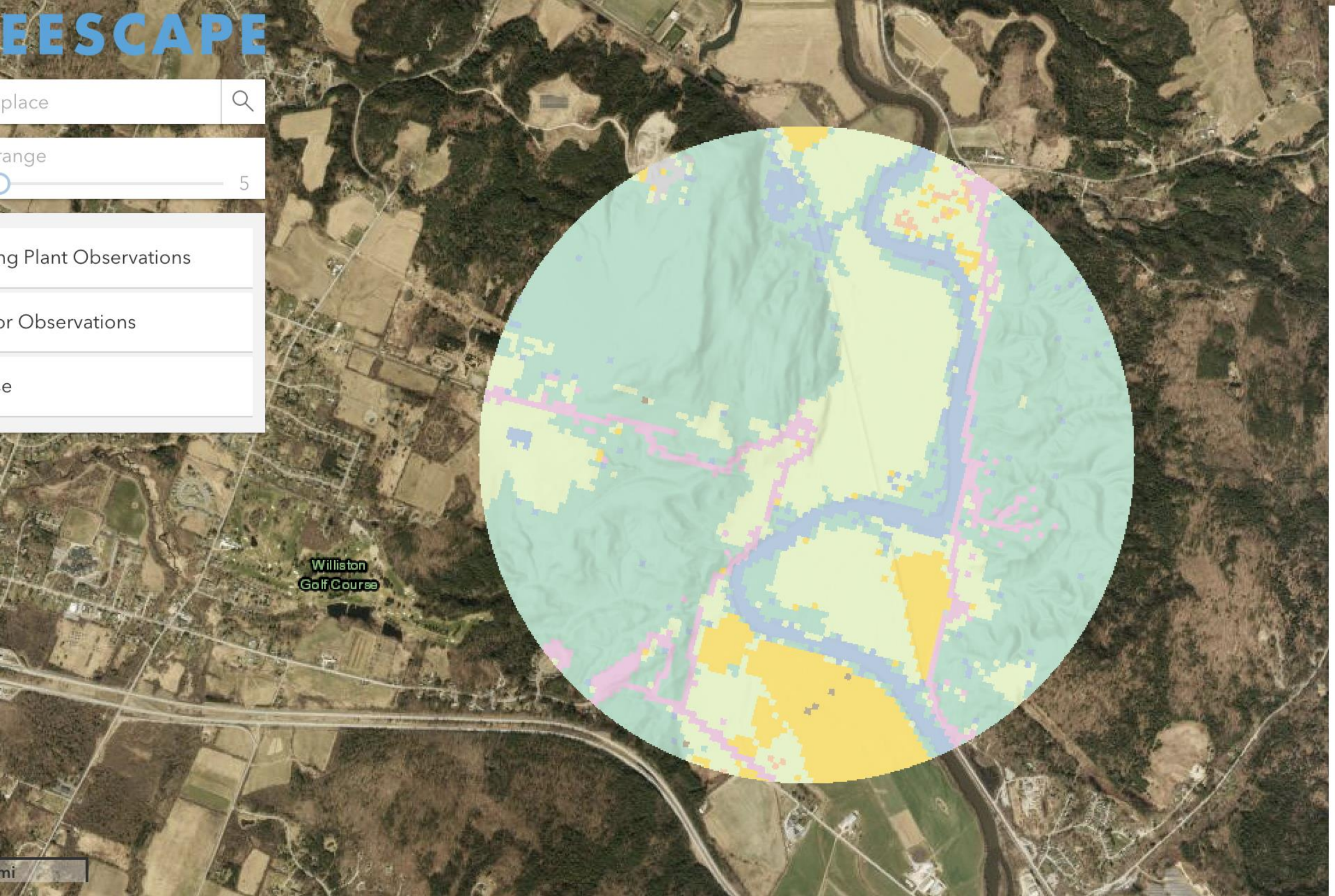








2023-2024 Site 4 Crop Insecticide Layer 5% Corn



Habitat Quality Factors

Nesting Availability for Wild Bees

Spring Floral Resources

Summer Floral Resources

Fall Floral Resources

Crop Insecticide Index

Land Use

Forest: 55%

Pasture/Hay: 25

Corn: 7%

Water/Wetland:

Economic Value

Pollinators contribute approx
annually to crop value.

Climate

Temperatu

80
70
60
50
40
nperature (°F)

Current and Future Initiatives – **Increase Pollinator Habitat**

Collaborating with AOT enhancing pollinator habitat along Interstate corridors

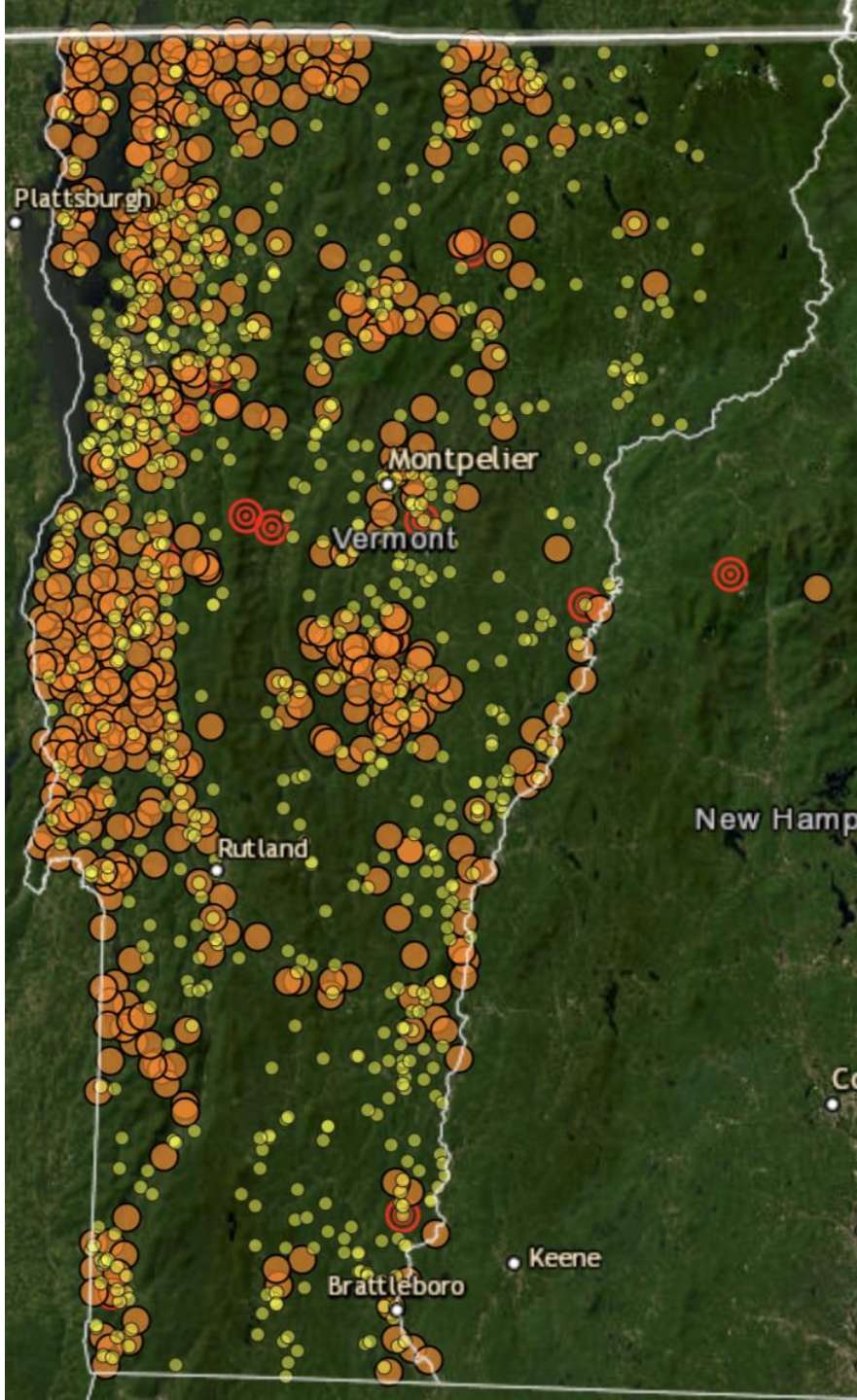
Vermont Center for Ecostudies pollinator study

Pollen Botanical ID on 3036 pollen

Pollinator Habitat Considerations

- Pollinators need season- long forage availability
- 3036 study sites all had low fall floral resources (Beescape)

- Vermont landscape is diverse
  - Varied elevation, soils, microclimates, and land use
    - Forests, crop lands, developed area
  - Forests play an important role
    - Maple, basswood, serviceberry, black locust
- Can we use this Beescape too to focus our efforts?
  - Perhaps consider crop land areas to encourage more floral diversity



Inspector Training Thailand

Grant funded inspector trainings

- **8**- Apiary Inspectors
- **3**- Researchers
- **2**- Camera crew
- **1**- Industry leader

AUBURN UNIVERSITY

extension
ALABAMA A&M & AUBURN UNIVERSITIES

Apiary Inspectors of America

CMU CHIANG MAI UNIVERSITY

Tropilaelaps Training at Auburn University

- **58** Apiculture Leaders
- **37** States, Provinces & Territories

Project *Apis m.*

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