Effective control of invasive *Phragmites* in Great Salt Lake wetlands

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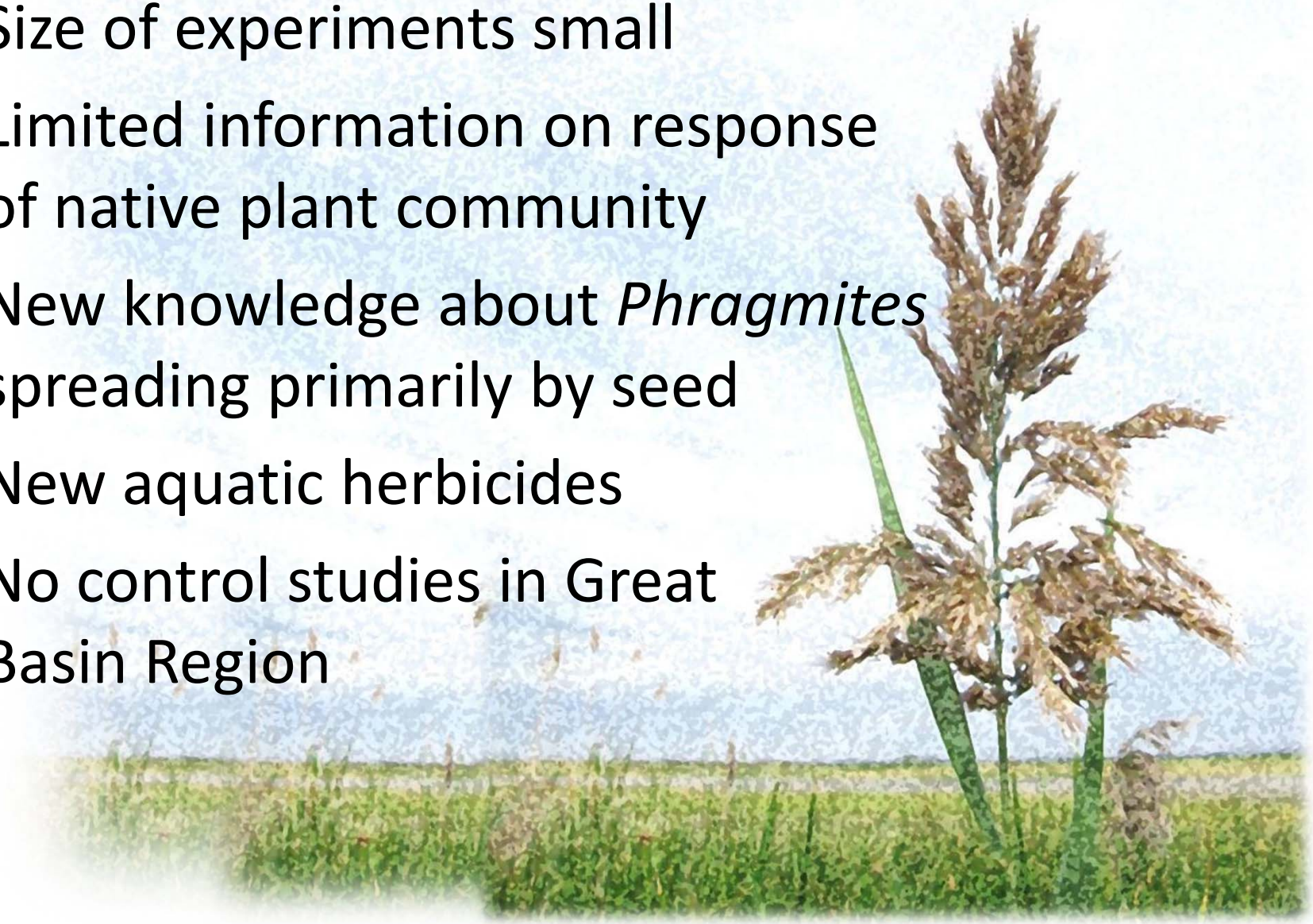
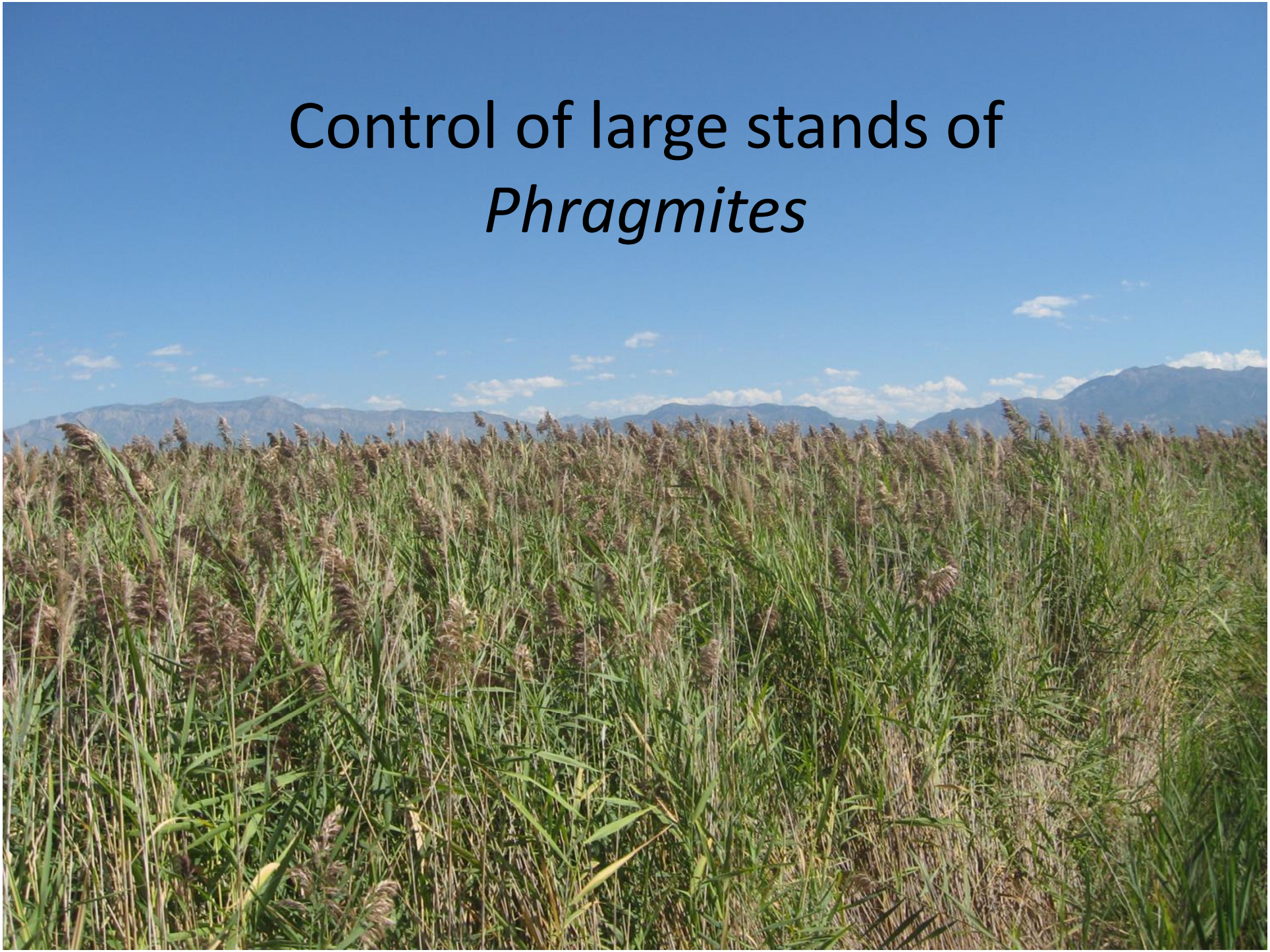
Research limitations & knowledge gaps

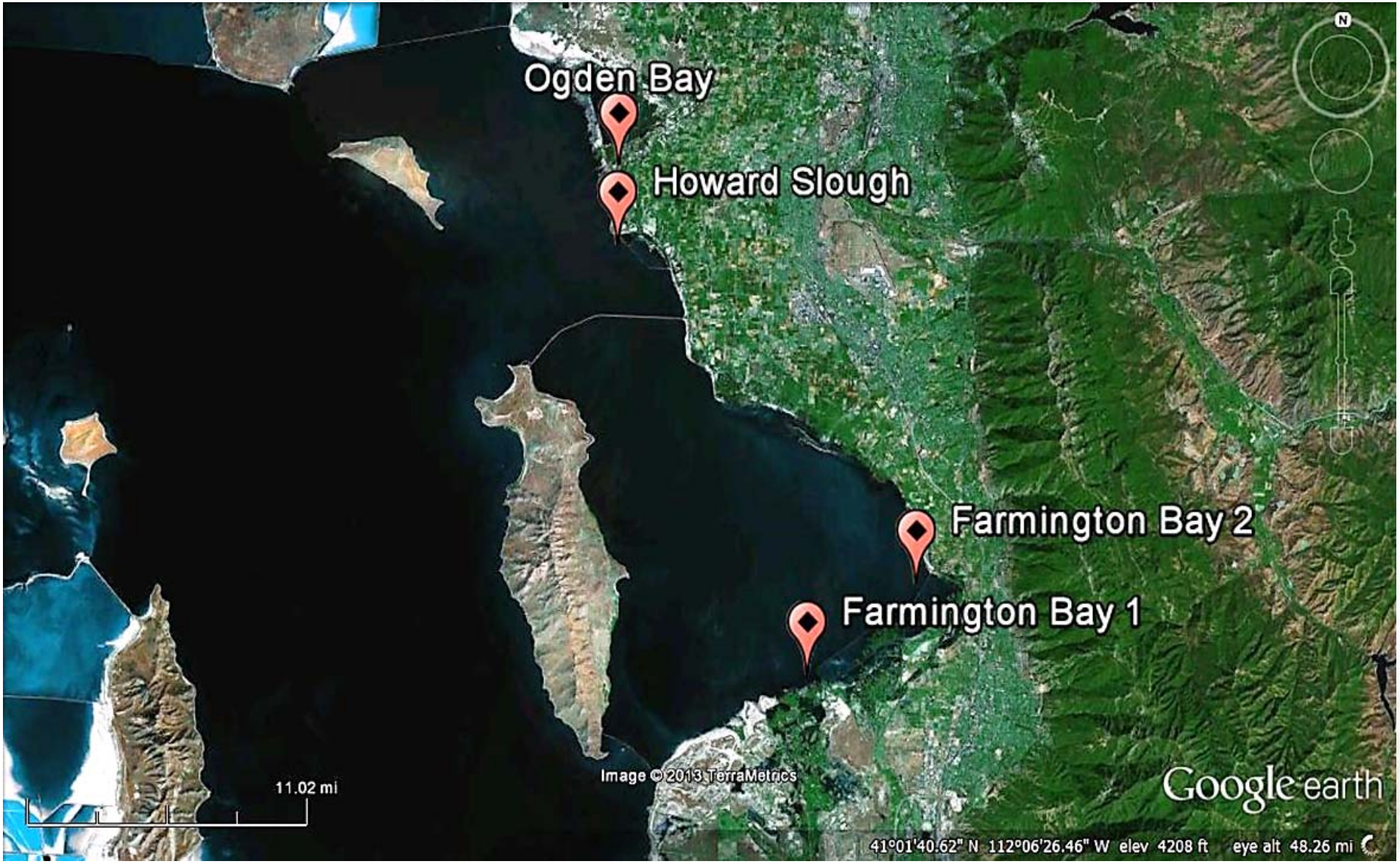
1. Size of experiments small
2. Limited information on response of native plant community
3. New knowledge about *Phragmites* spreading primarily by seed
4. New aquatic herbicides
5. No control studies in Great Basin Region



Control of large stands of *Phragmites*



Study Sites

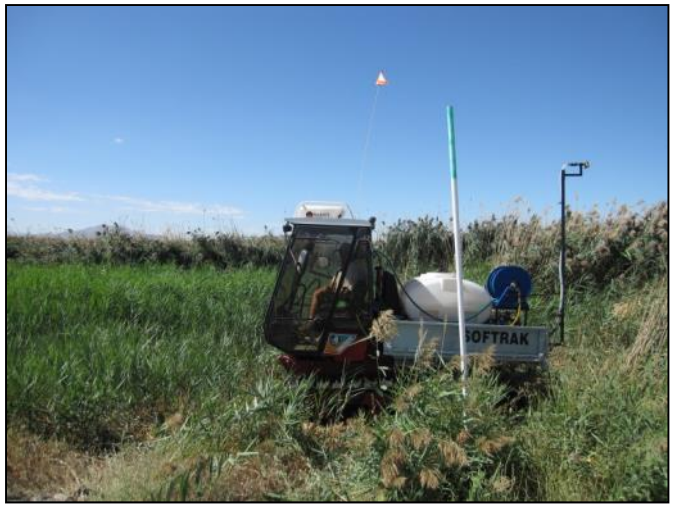

Ogden Bay
Howard Slough
Farmington Bay 2
Farmington Bay 1
11.02 mi
Image © 2013 TerraMetrics
Google earth
41°01'40.62" N 112°06'26.46" W elev 4208 ft eye alt 48.26 mi

Treatments

1. Summer glyphosate application
2. Fall glyphosate application
3. Summer imazapyr application
4. Fall imazapyr application
5. Untreated control

Summer = last week of June/first week July

Fall = last week of August/first week September



POSI-TRACK
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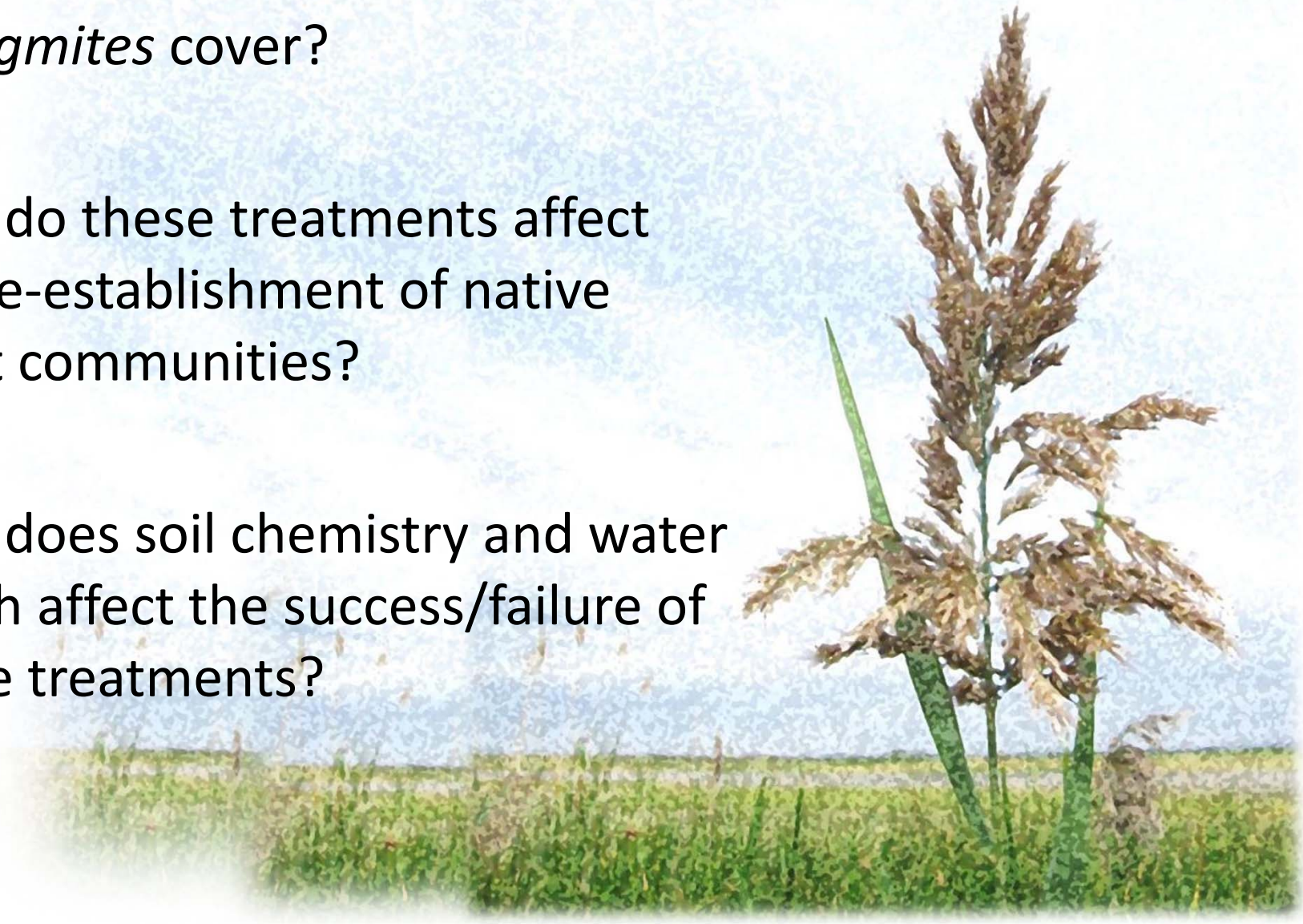
Research Questions

1. How do these treatments affect *Phragmites* cover?

2. How do these treatments affect the re-establishment of native plant communities?

3. How does soil chemistry and water depth affect the success/failure of these treatments?



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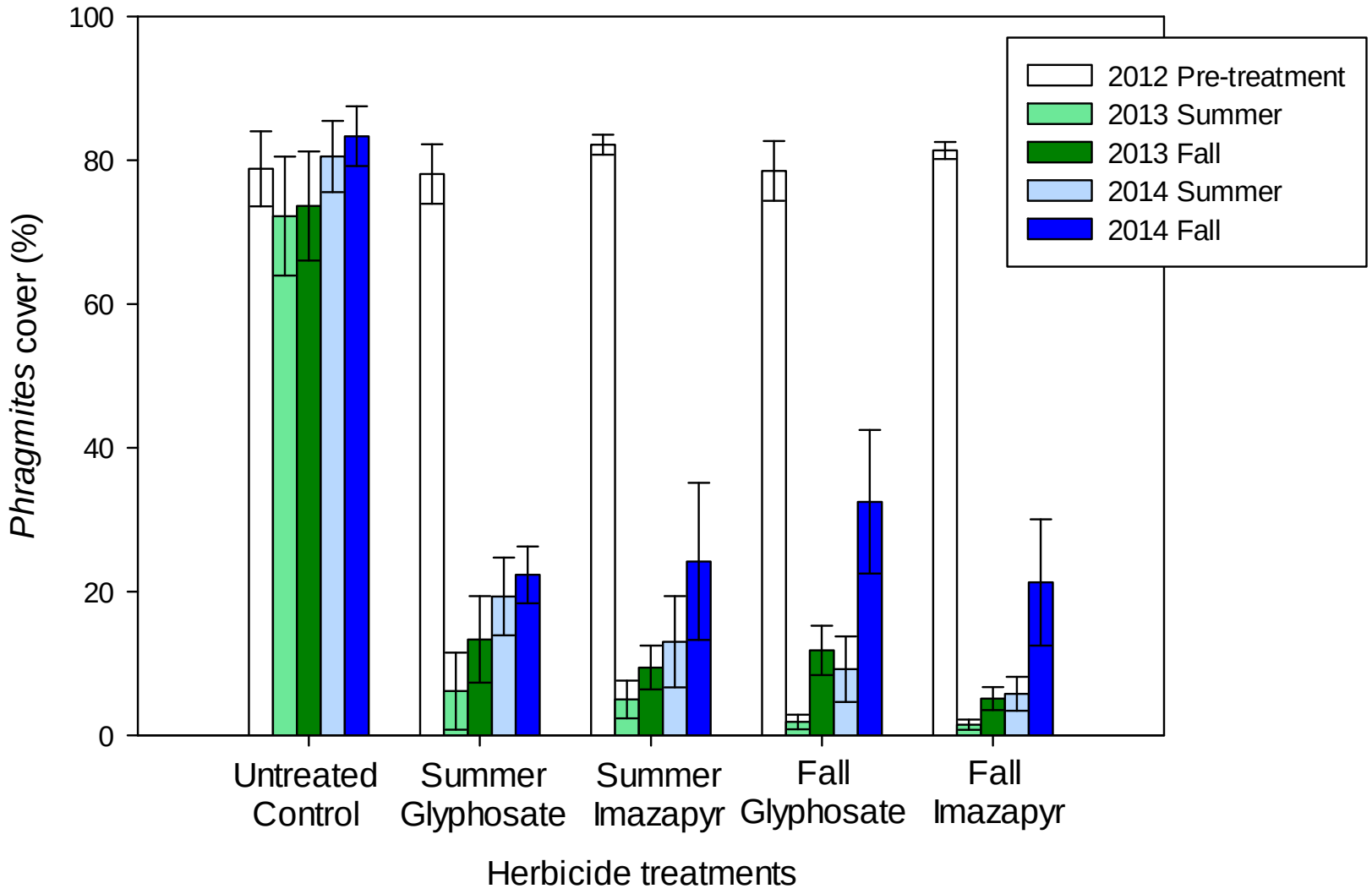
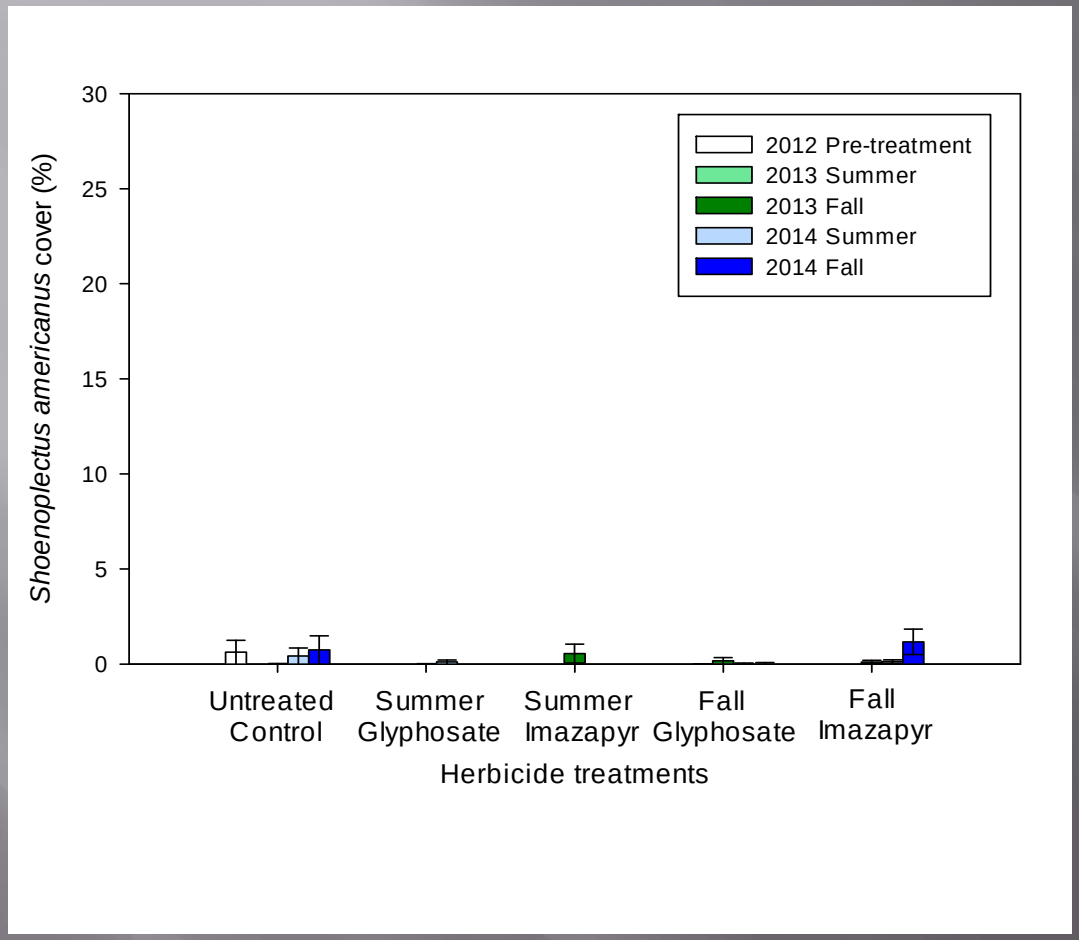
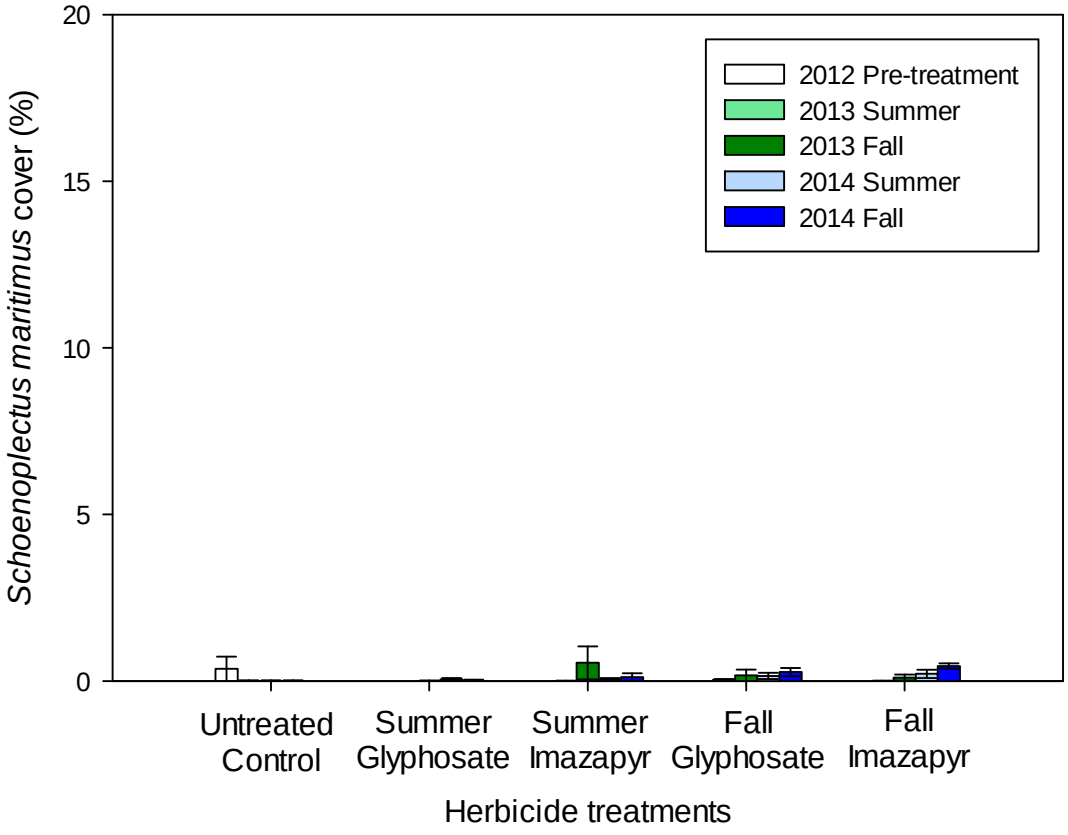
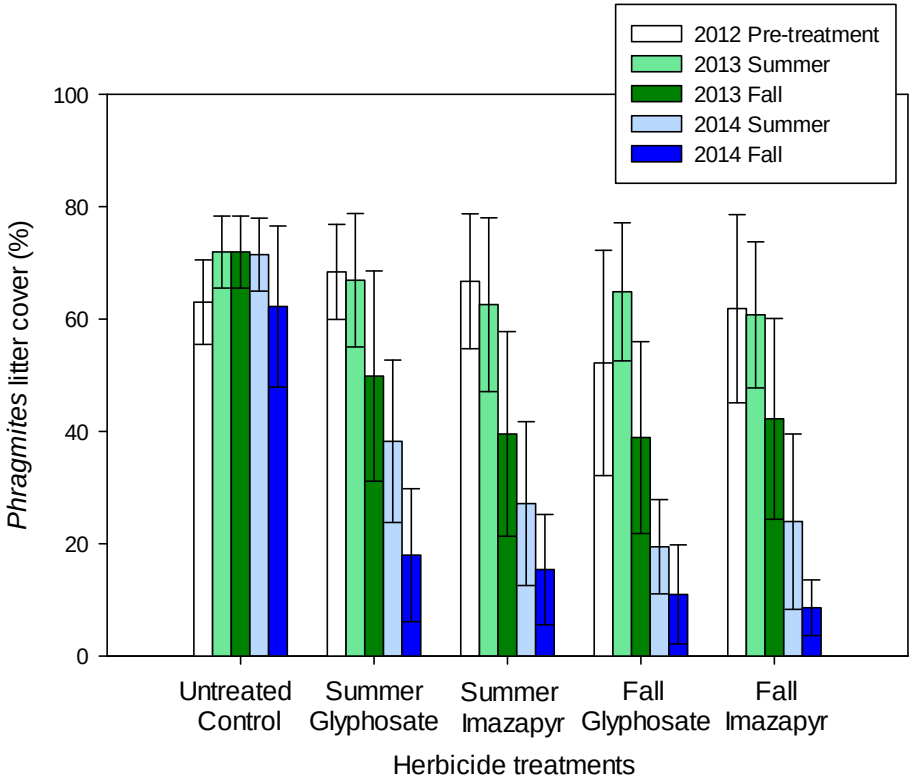


2. How do these treatments affect the re-establishment of native plant communities?




20
15
10
5
0
Schoenoplectus maritimus cover (%)
2012 Pre-treatment
2013 Summer
2013 Fall
2014 Summer
2014 Fall
Untreated Control
Summer Glyphosate
Summer Imazapyr
Fall Glyphosate
Fall Imazapyr
Herbicide treatments

WHY?


2012 Pre-treatment
2013 Summer
2013 Fall
2014 Summer
2014 Fall
100
80
60
40
20
0
Phragmites litter cover (%)
Untreated Control
Summer Glyphosate
Summer Imazapyr
Fall Glyphosate
Fall Imazapyr
Herbicide treatments

3. How does soil chemistry and water depth affect the success/failure of these treatments?

Conclusions so far….

- All herbicide applications have similar effect on *Phragmites*
- Very little native plant recovery
- Results on native plant recovery inconclusive
- Methods for dealing with dead biomass???

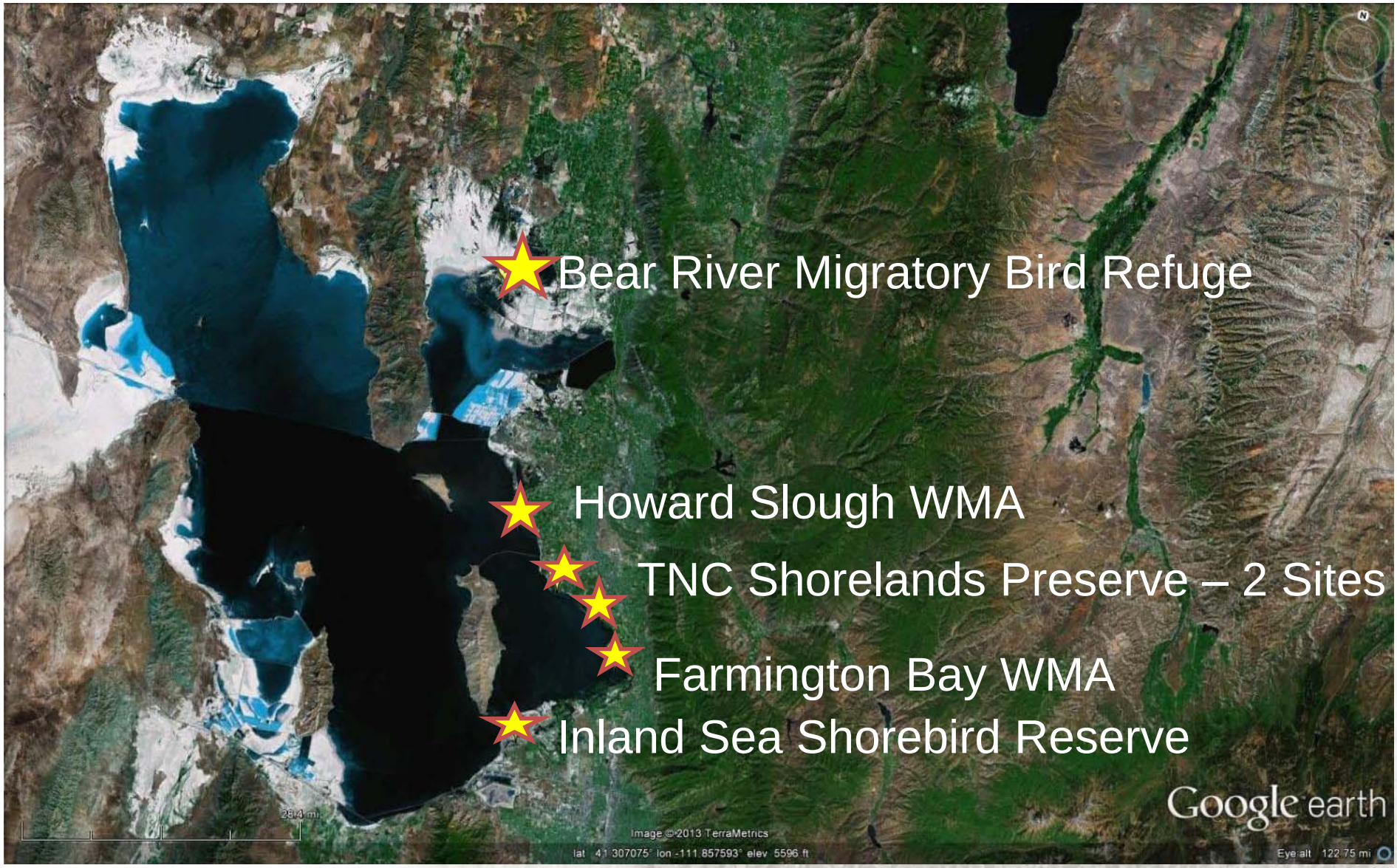
Small Patch Study - Research Questions

1. What are effective treatments for controlling small patches of *Phragmites*?

2. Which control treatments have the greatest benefit for native plant communities?

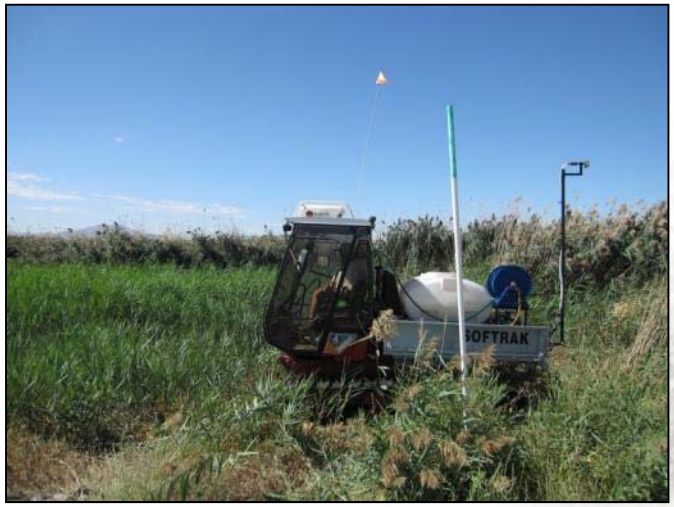
3. Which treatments are able to limit *Phragmites* seed production?

Study Area

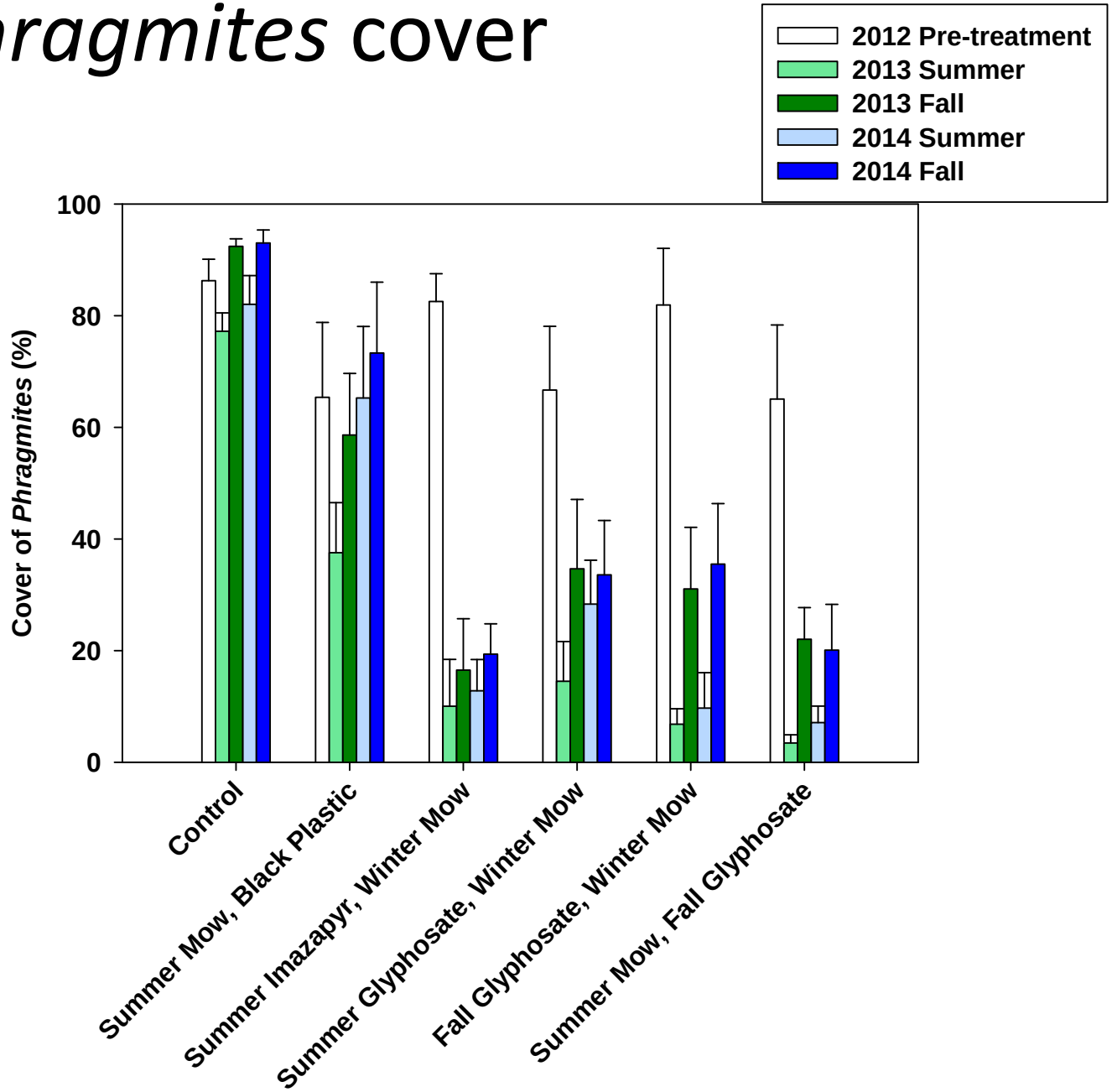

Bear River Migratory Bird Refuge
Howard Slough WMA
TNC Shorelands Preserve – 2 Sites
Farmington Bay WMA
Inland Sea Shorebird Reserve
Google earth
Image © 2013 TerraMetrics
lat 41.307075° lon -111.857593° elev 5596 ft
Eye alt 122.75 mi

Treatments

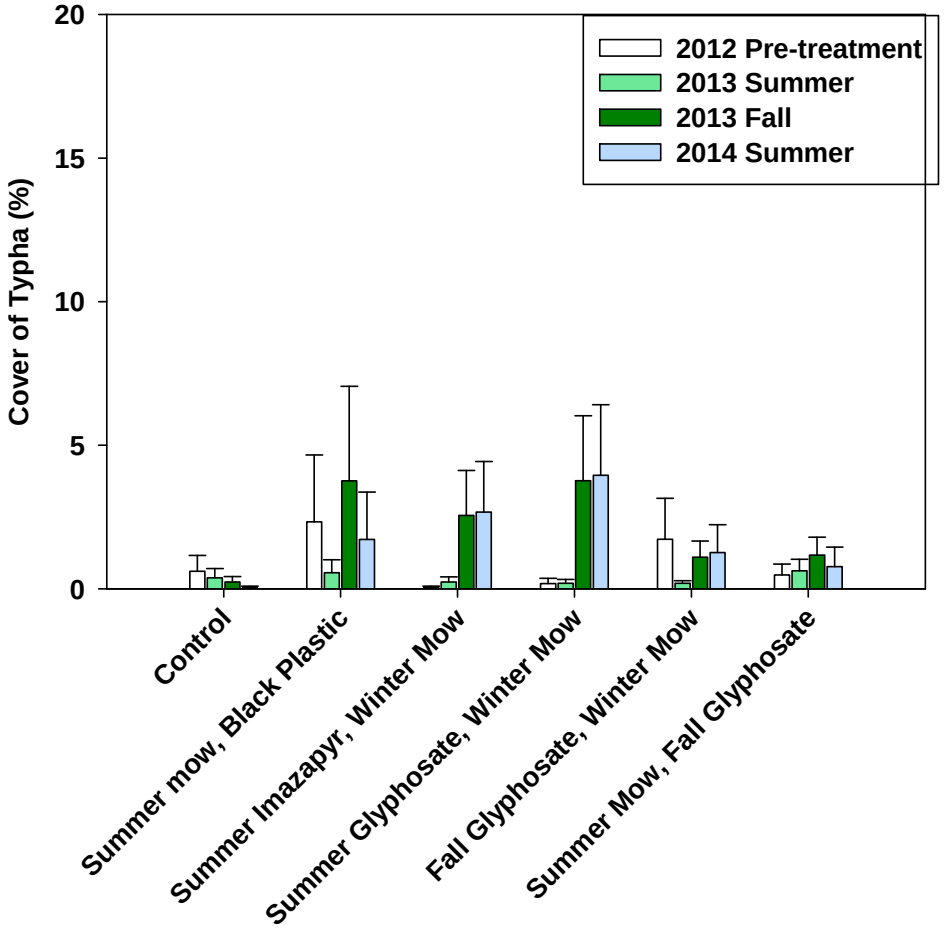
1.) Fall glyphosate spray, winter mow
2.) Summer imazapyr spray, winter mow
3.) Summer glyphosate spray, winter mow
4.) Summer mow, fall glyphosate spray
5.) Summer mow, then cover with black plastic
6.) Untreated control

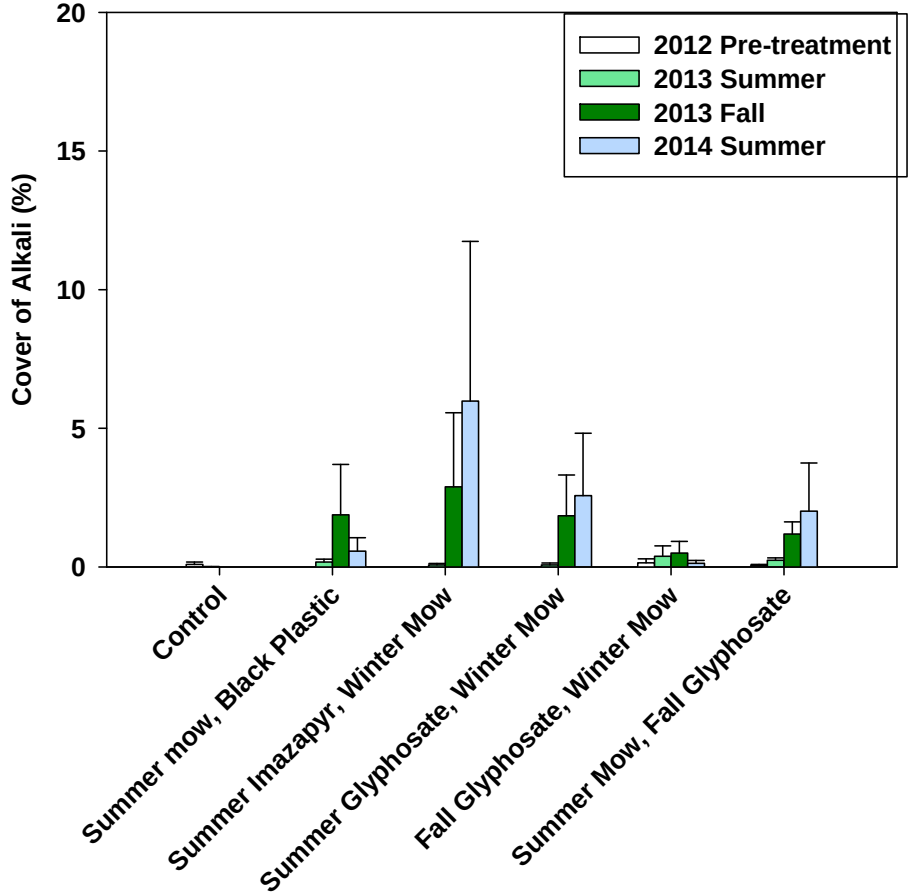


Results: *Phragmites* cover



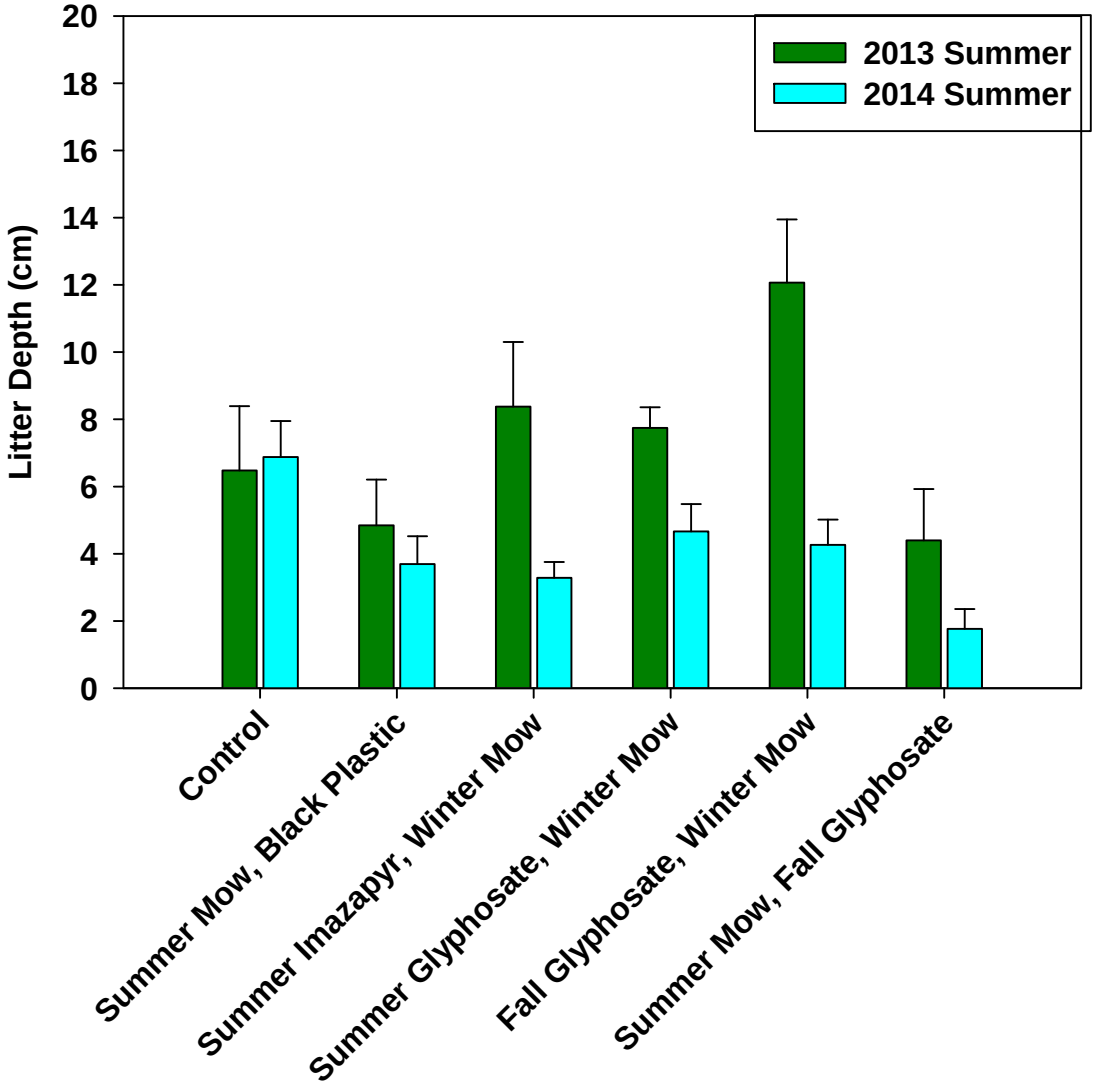
Results: Native plant cover



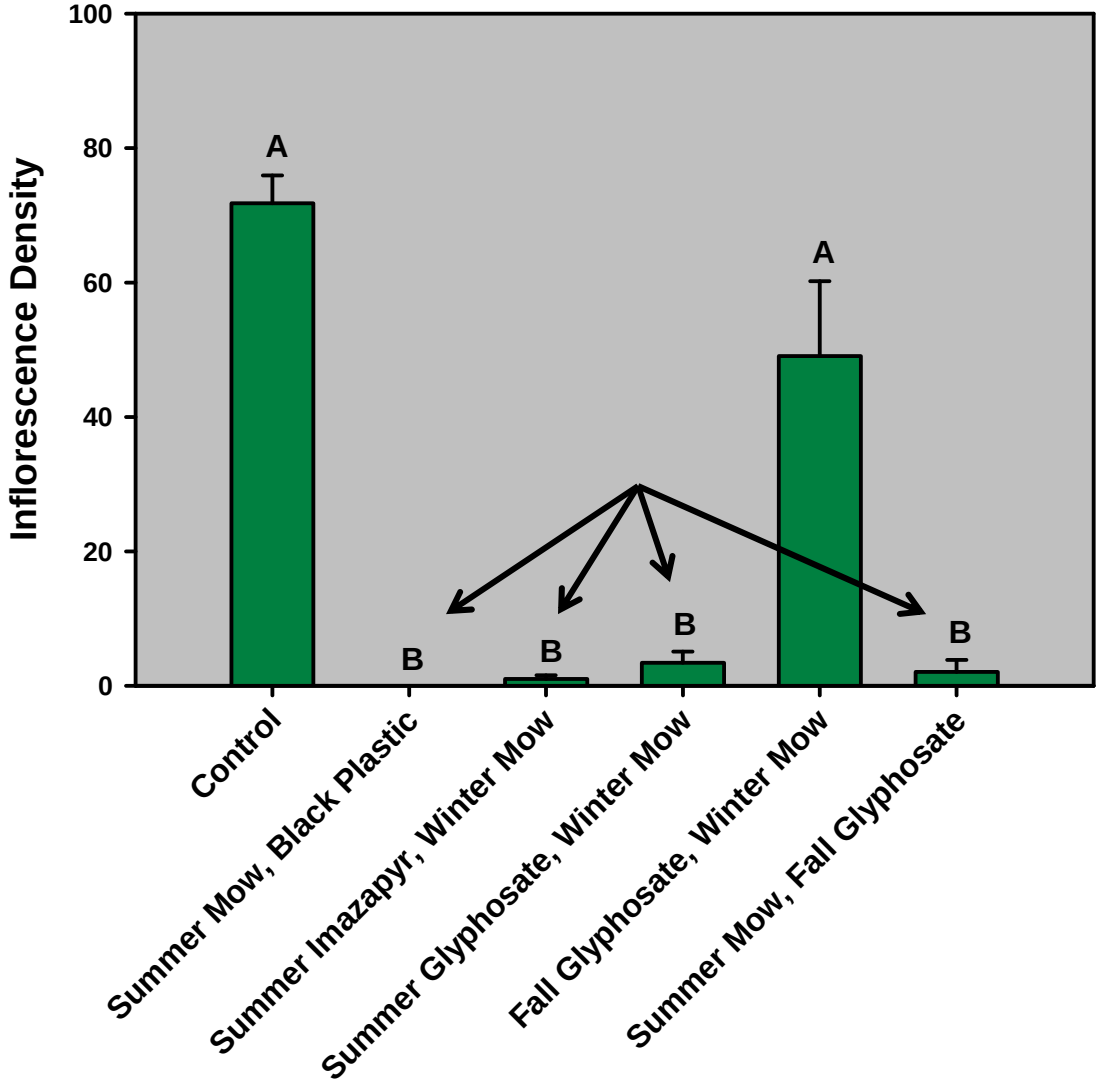


Results: Native plant cover

Results: Litter Depth



Results: Summer treatments reduce *Phragmites* seeds

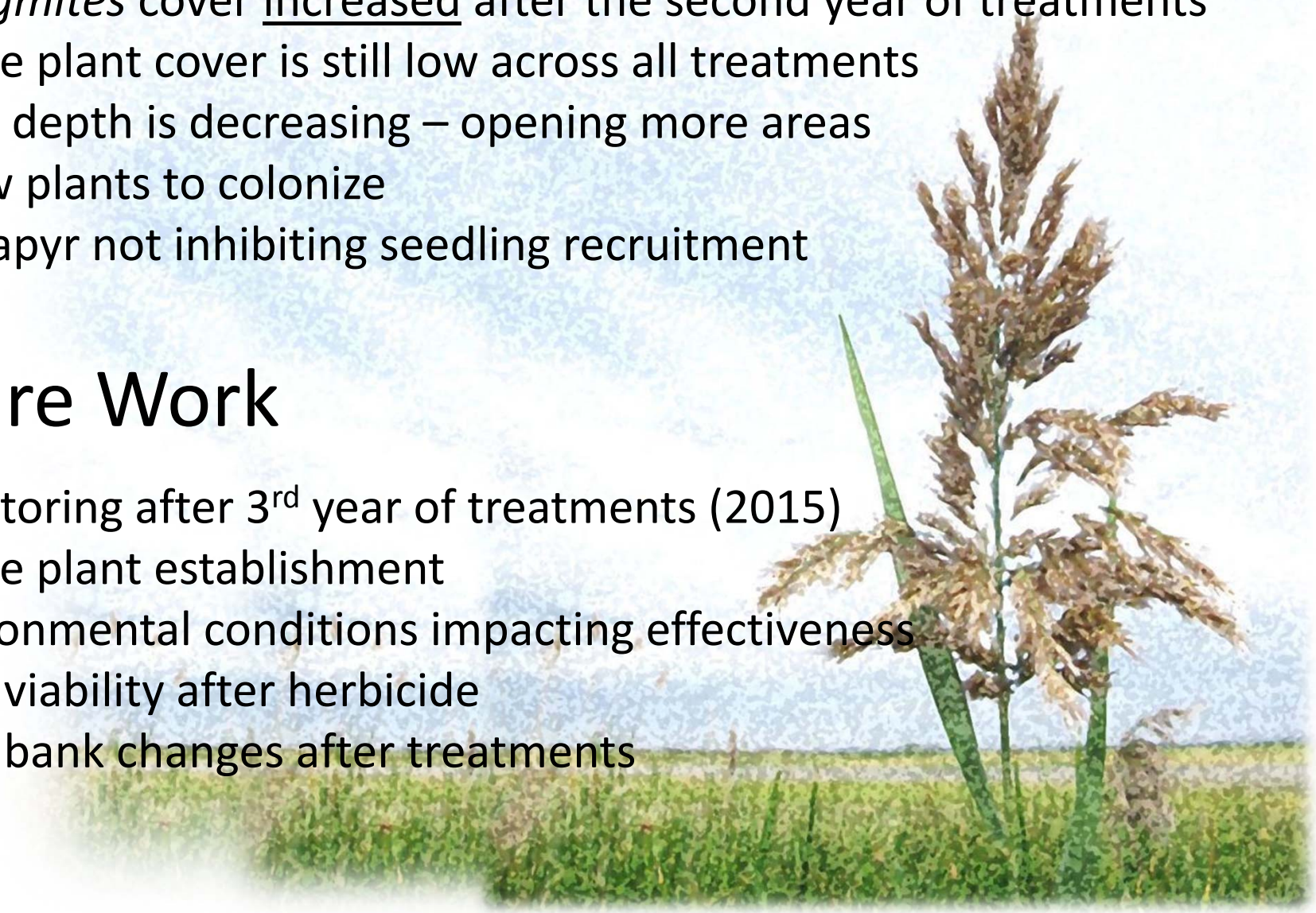


Conclusions

- *Phragmites* cover <u>increased</u> after the second year of treatments
- Native plant cover is still low across all treatments
- Litter depth is decreasing – opening more areas for new plants to colonize
- Imazapyr not inhibiting seedling recruitment

Future Work

- Monitoring after 3rd year of treatments (2015)
- Native plant establishment
- Environmental conditions impacting effectiveness
- Seed viability after herbicide
- Seed bank changes after treatments



Thanks for all the help and support

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