

# Plant Community Changes in Northern Alaska in Response to Warming

Jeremy May and Robert Hollister

Grand Valley State University

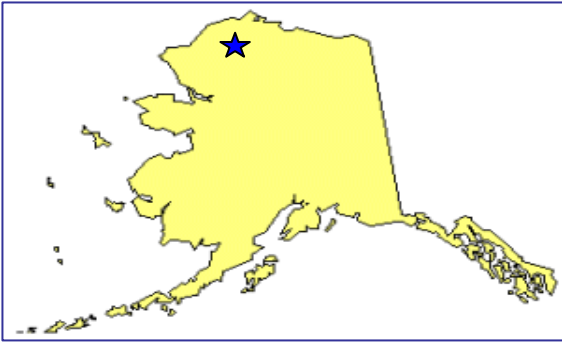


# Outline

- Site Description
- Methods
- Absolute cover changes between warmed and control plots in 2007
- Difference between All Hit and Top/Bottom Only sampling
- Cover change in sites 1996-2007
- Control plot cover change 1996-2007
- Conclusions
- Future Project Plans



# Site Description



Sites located near Atkasuk in the North Slope Borough of Alaska

Mean July temperature- 3.7 degrees Celsius

Each site consists of 24 warmed and 24 control plots

## Dry Site



Well drained edge of lake basin

## Wet Site



Frequently flooded edge of a thaw lake

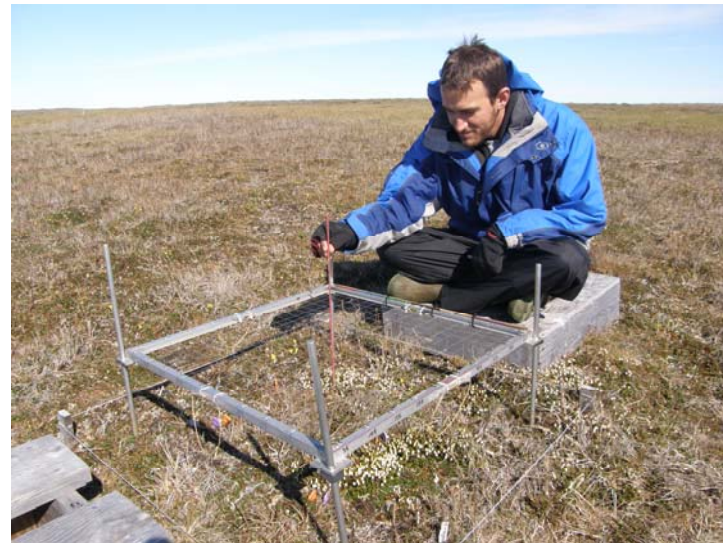
# Methods Summary

Samplings were done using point frame method

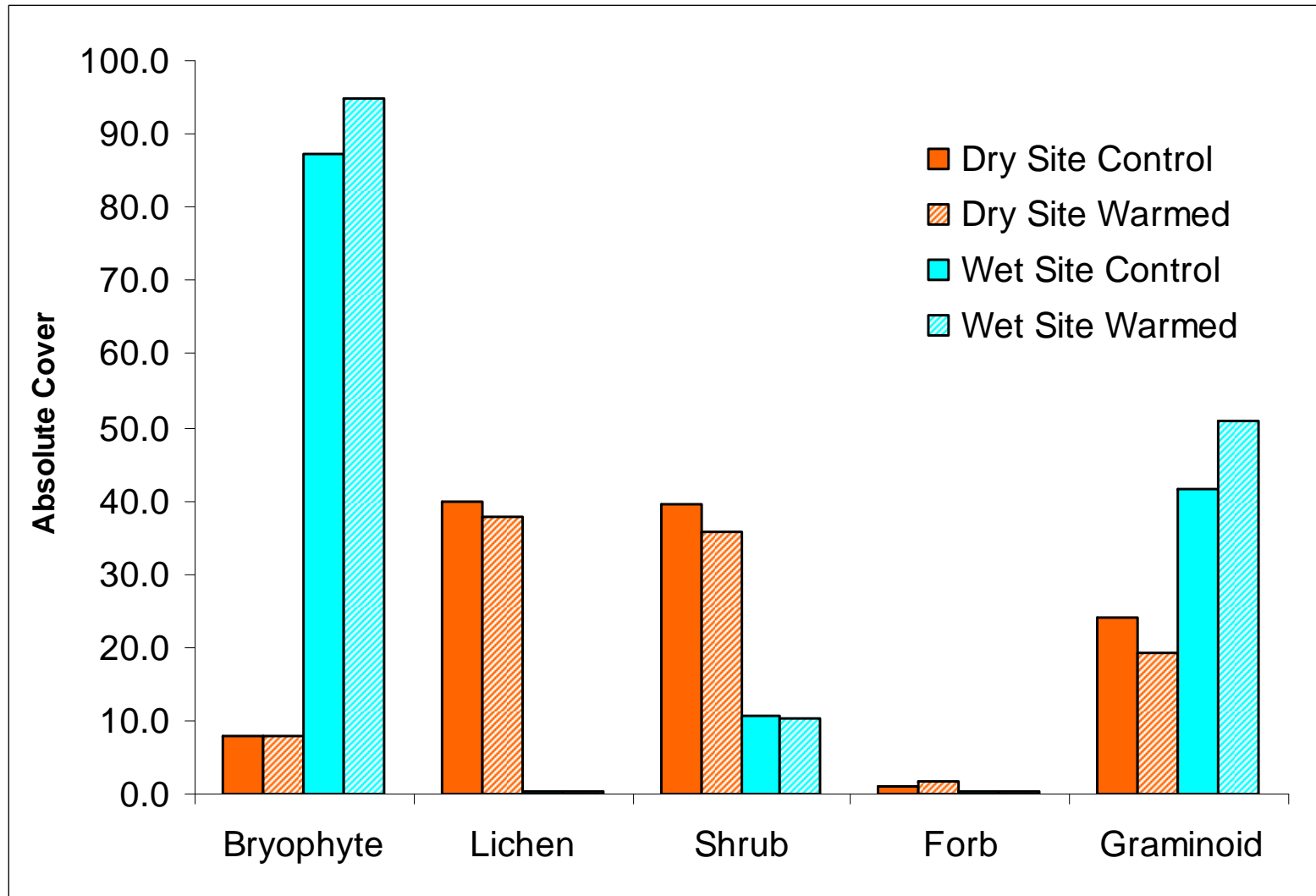
1996 and 2000 samplings were done recording top and bottom contacts only on the point frame grid

2007 sampling was done using all contacts on the point frame grid

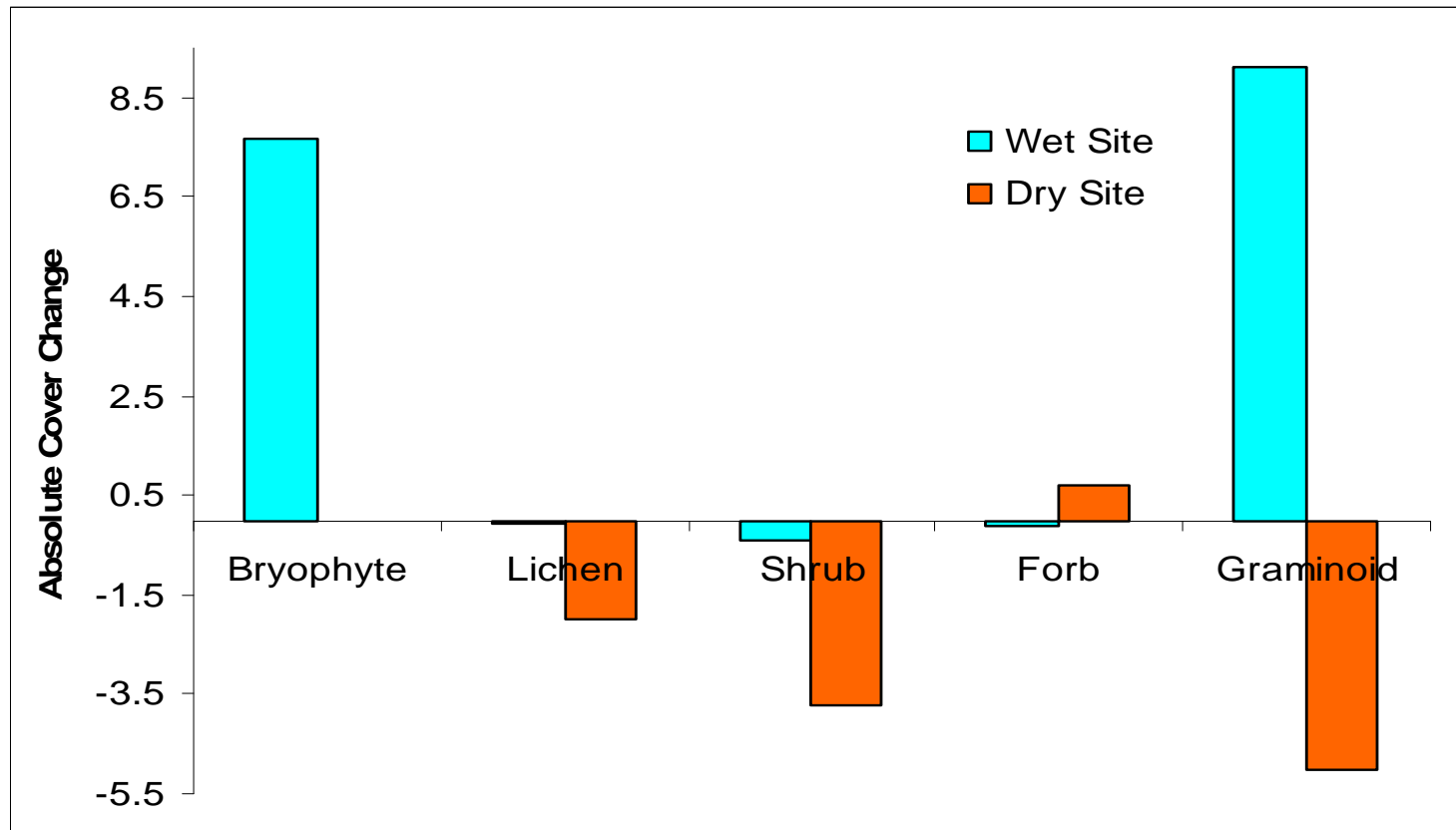
Samplings were done between Mid-July and Early-August to reduce differences in phenological development between samplings



## Absolute Cover for Atqasuk Sites 2007 All Hits



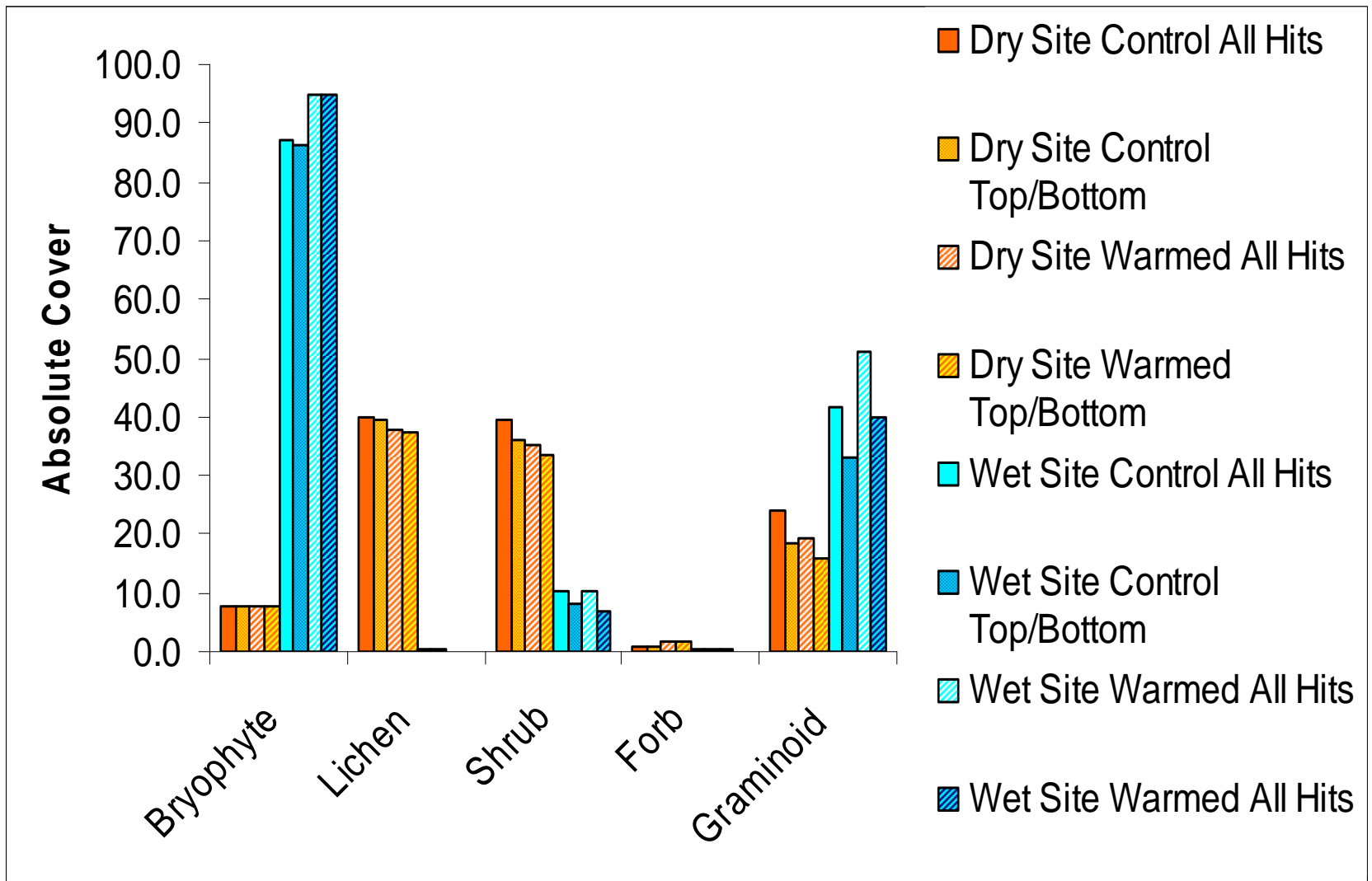
## Change in Absolute Cover between Warmed and Control Plots 2007 All Hits



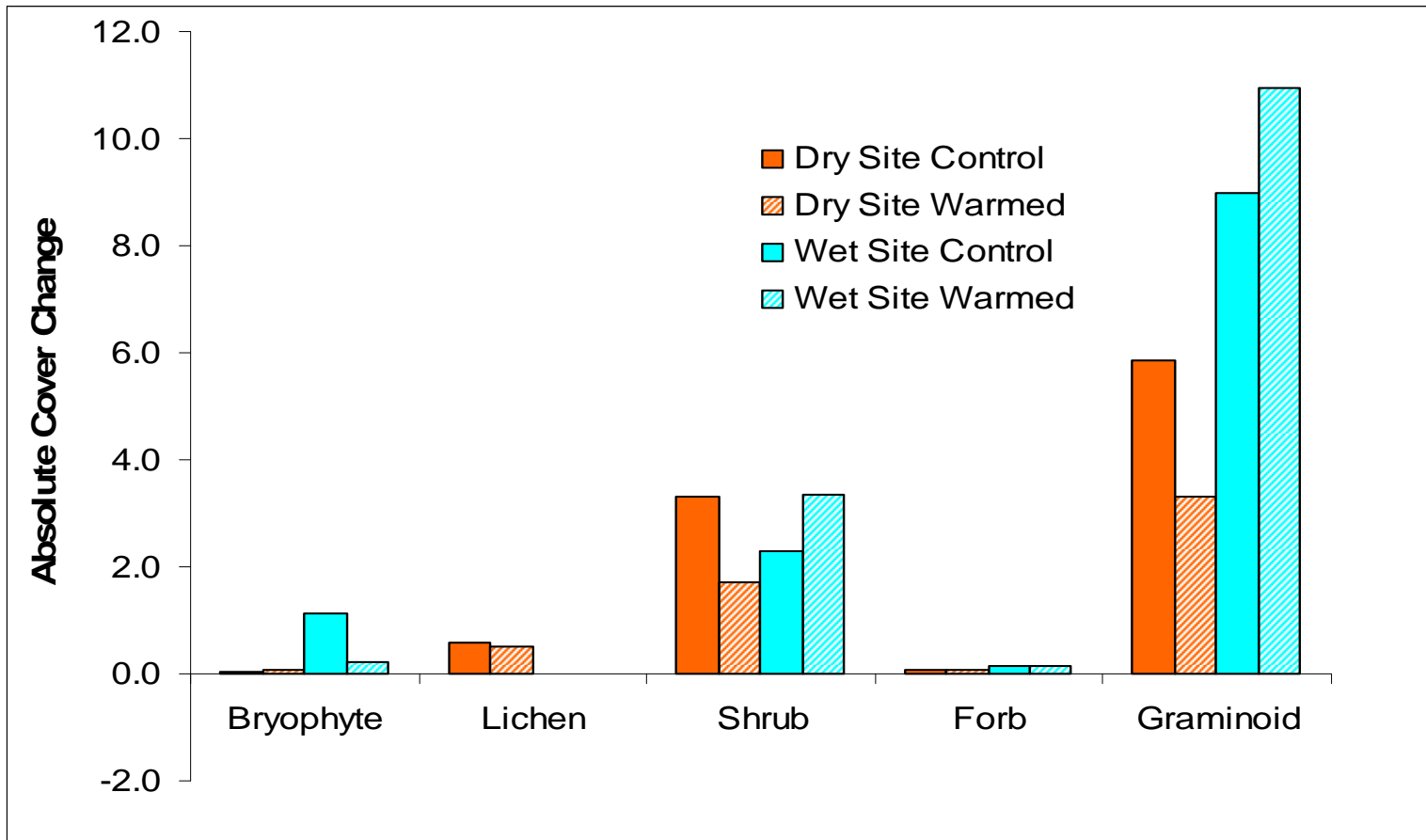
Graminoids and Forbs show a contradicting response between sites

Lichens and Shrubs show slight decreases or no change in response to warming

## Comparison of All Hits vs. Top/Bottom Hits Between Sites



## Differences in Absolute Cover Between All Hits and Top/Bottom Hits Only



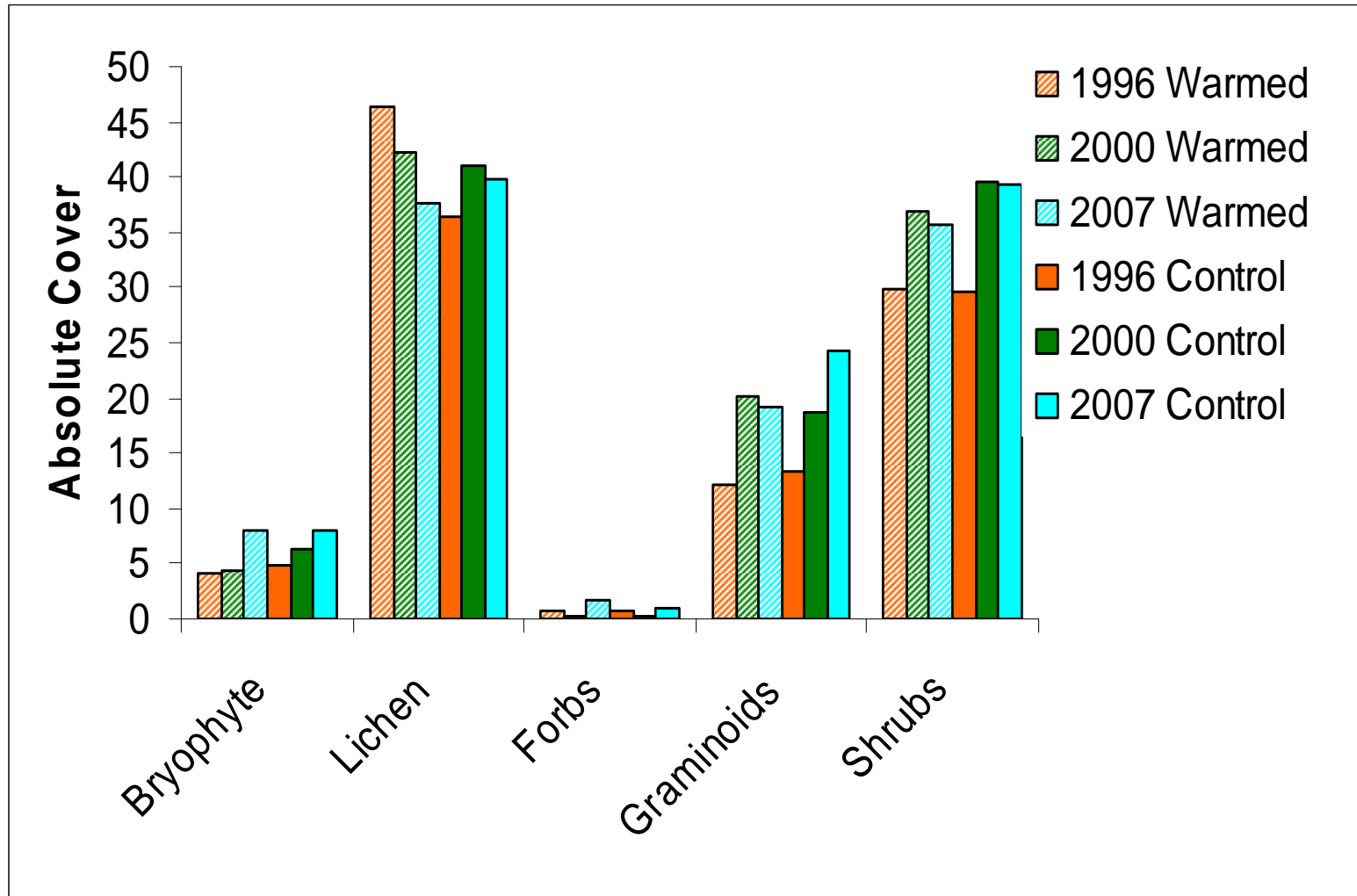
Overall top and bottom vs all hits have small differences

Graminoids and Shrubs show the most difference between methods

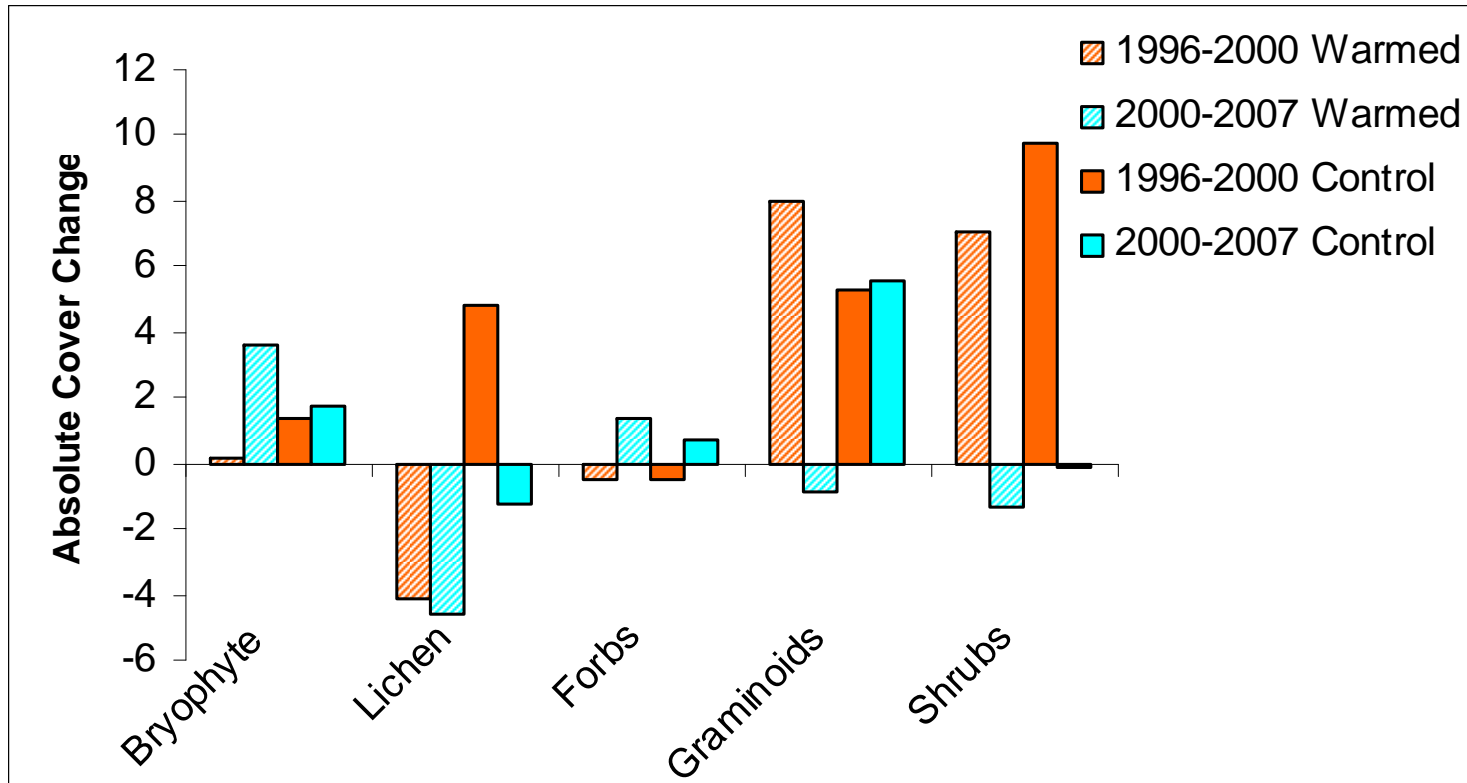


# Dry Site

## 1996-2007 (Top/Bottom Only)



## Dry Site Cover Change 1996-2007

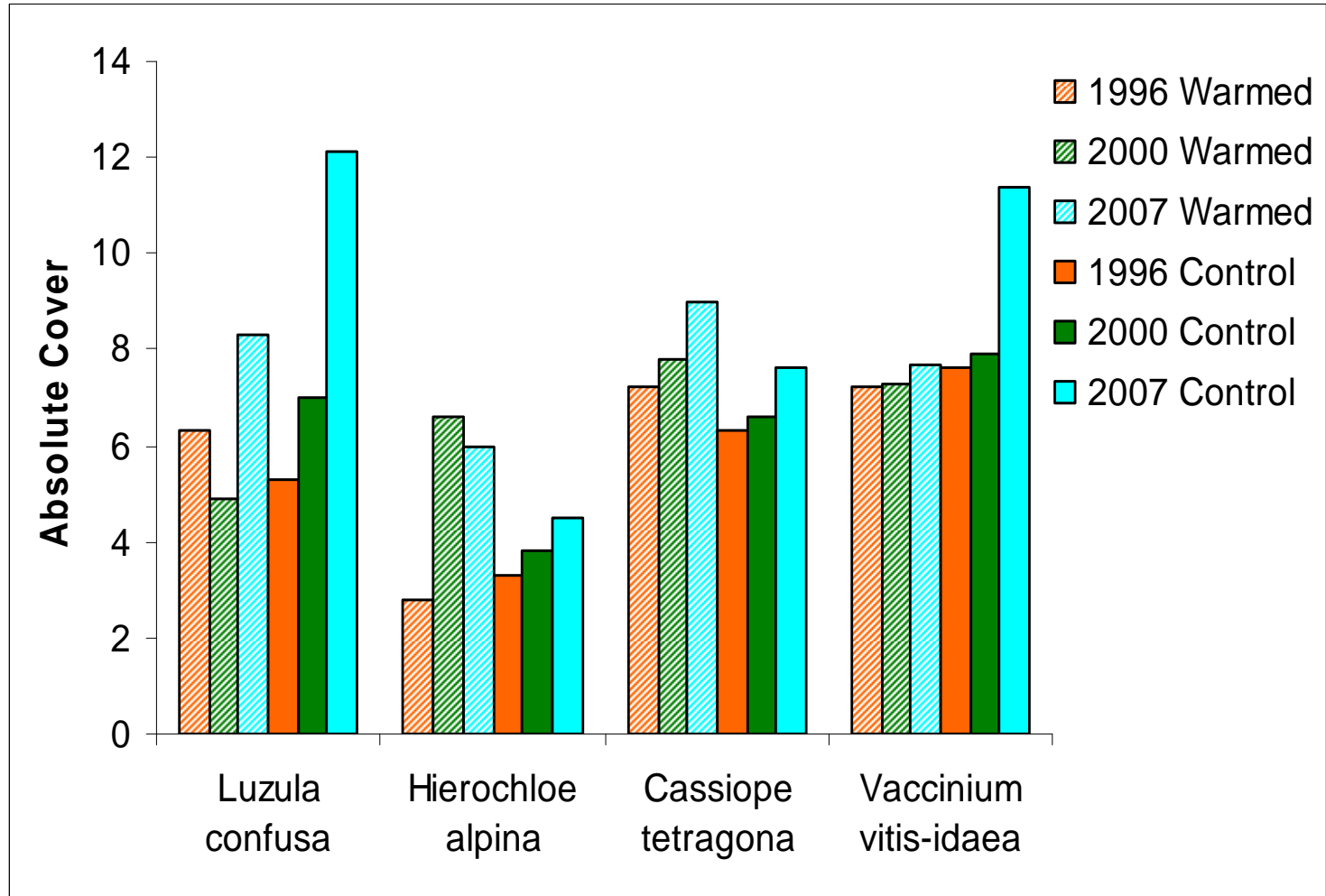


Bryophytes and Lichens show consistent changes between years due to warming

Graminoids and Bryophytes increased in control plots

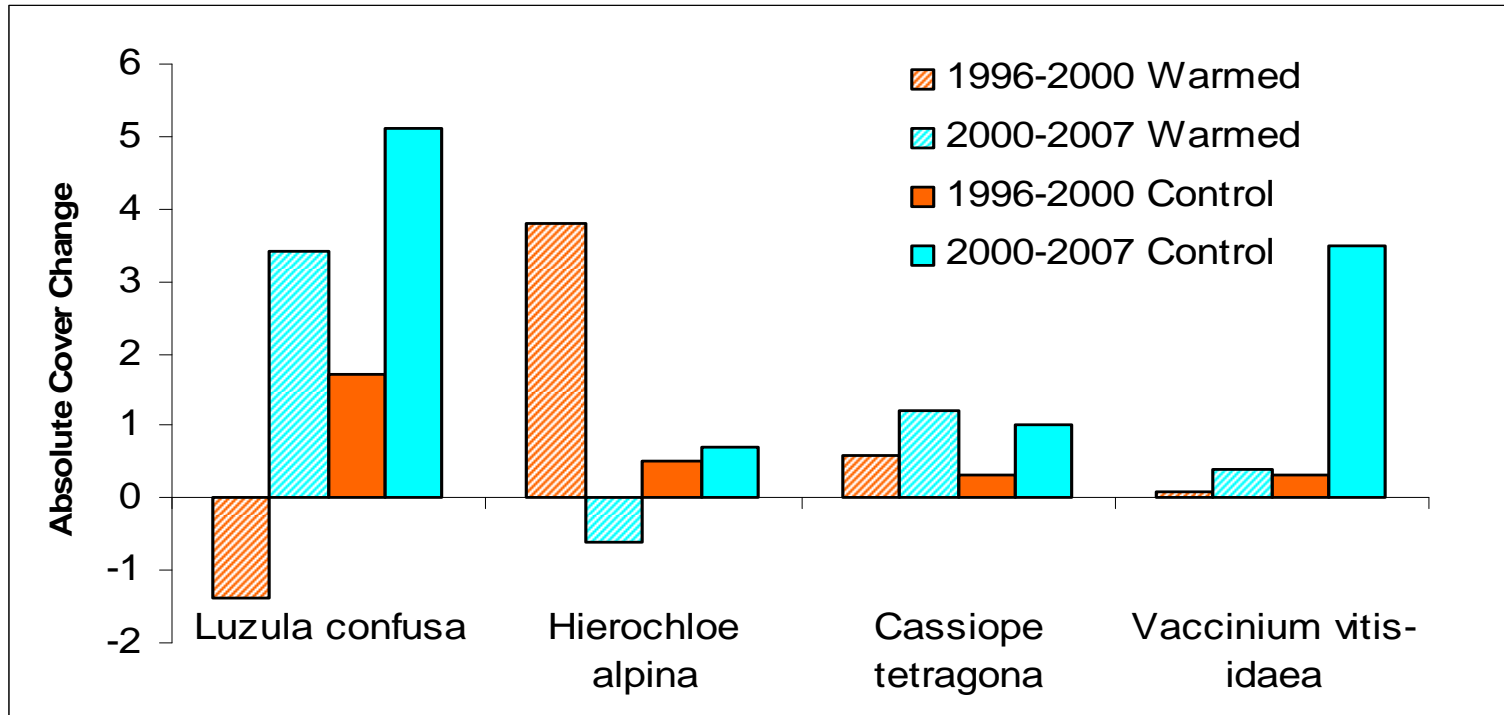
# Dry Site Select Species Absolute Cover

## 1996-2007



# Dry Site Select Species Cover Change

1996-2007

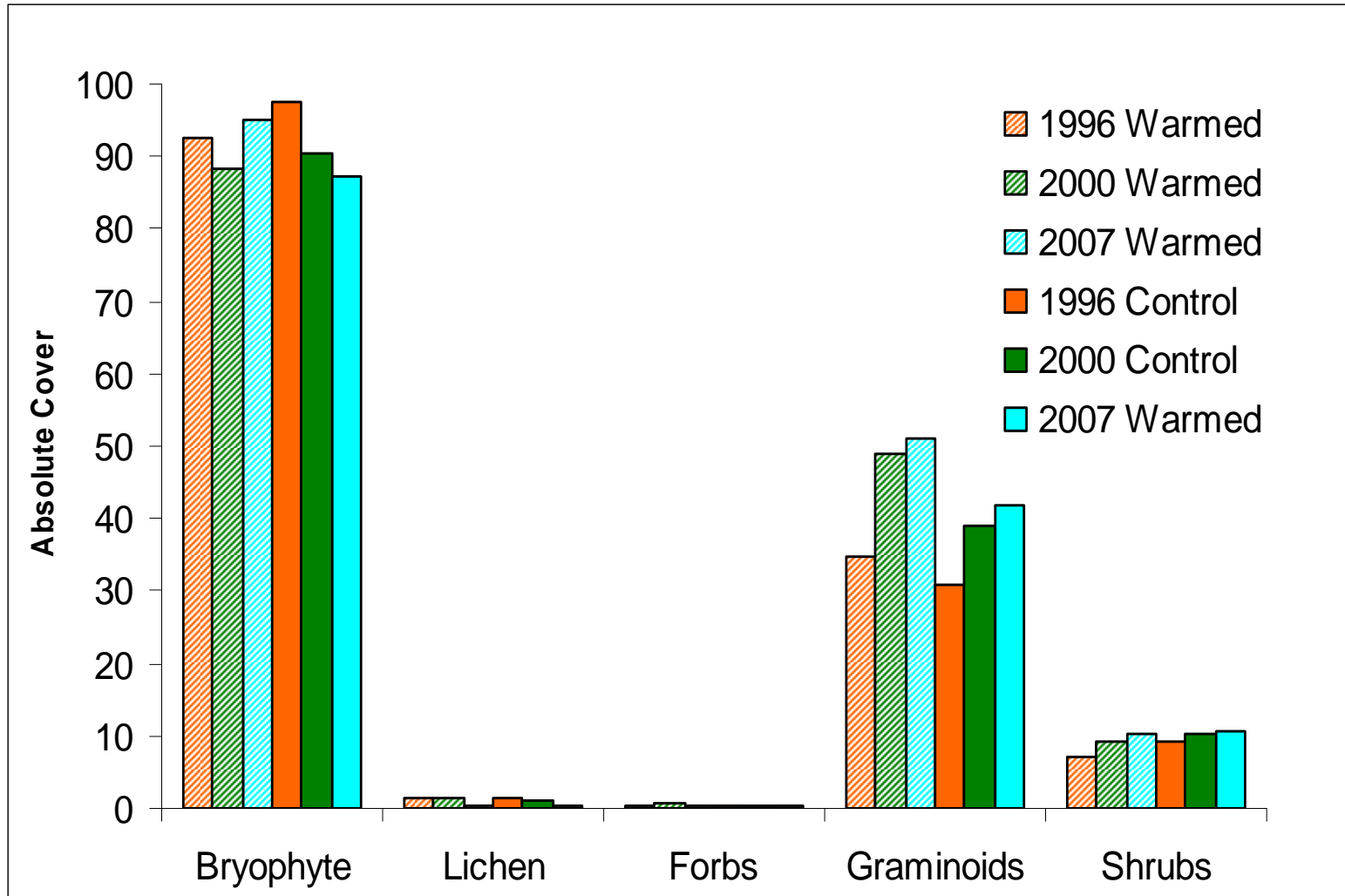


L. confusa and H. alpina show contradicting responses to warming

C. tetragona and V. vitis-idaea increased in warmed and control plots

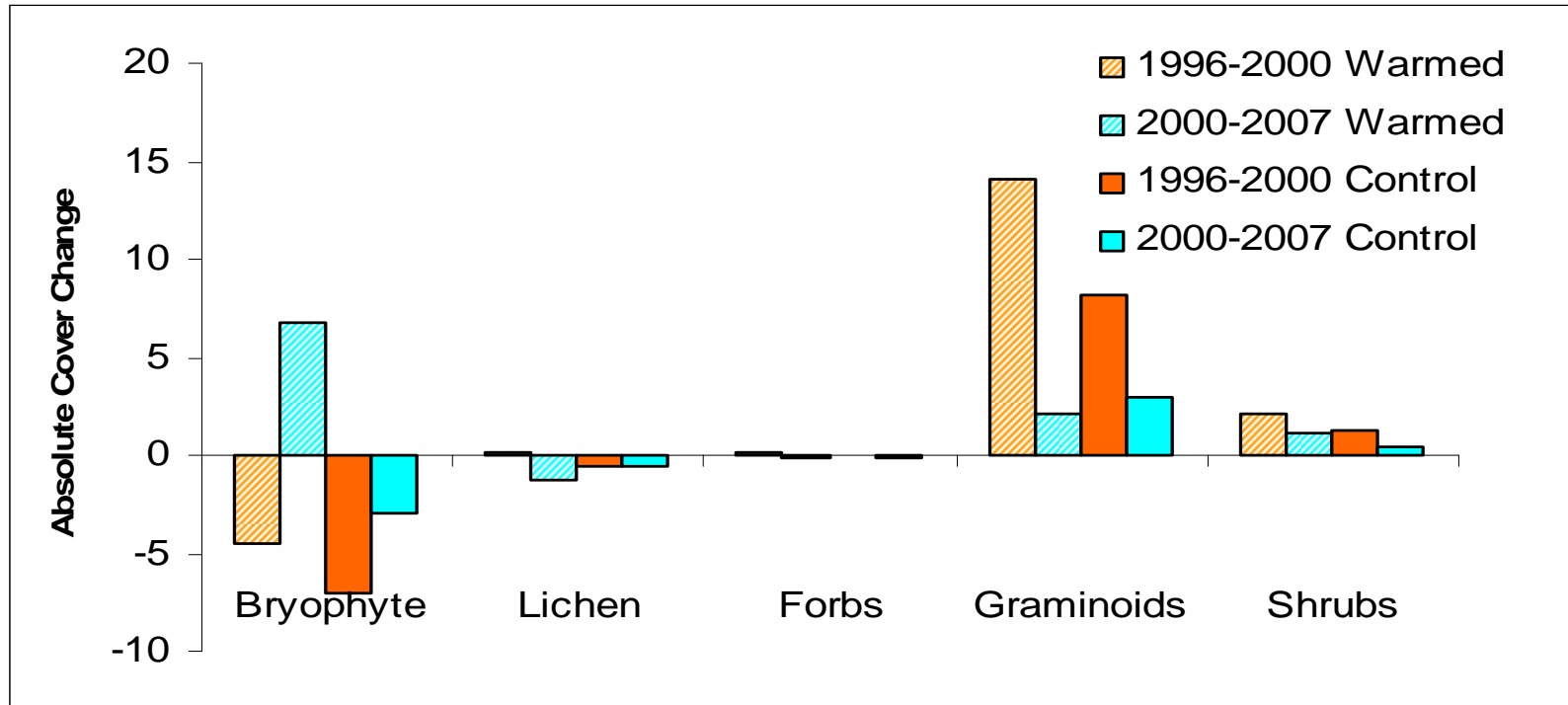
# Wet Site

## 1996-2007 (Top/Bottom Hit Only)



# Wet Site Growth Form Cover Change

1996-2007



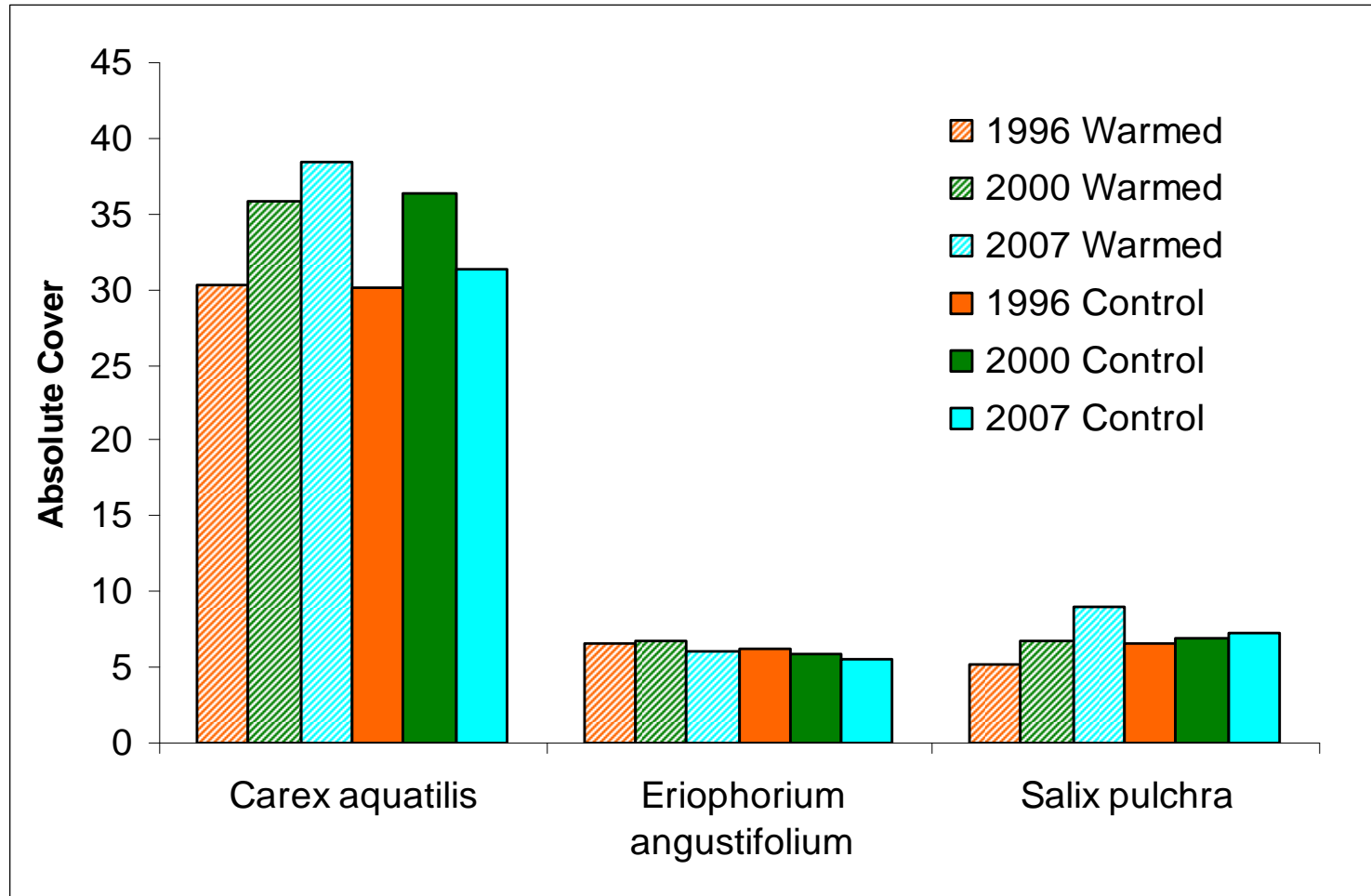
Bryophytes show contradicting responses to warming between years, decreased in control plots

Lichens and Forbs show little change

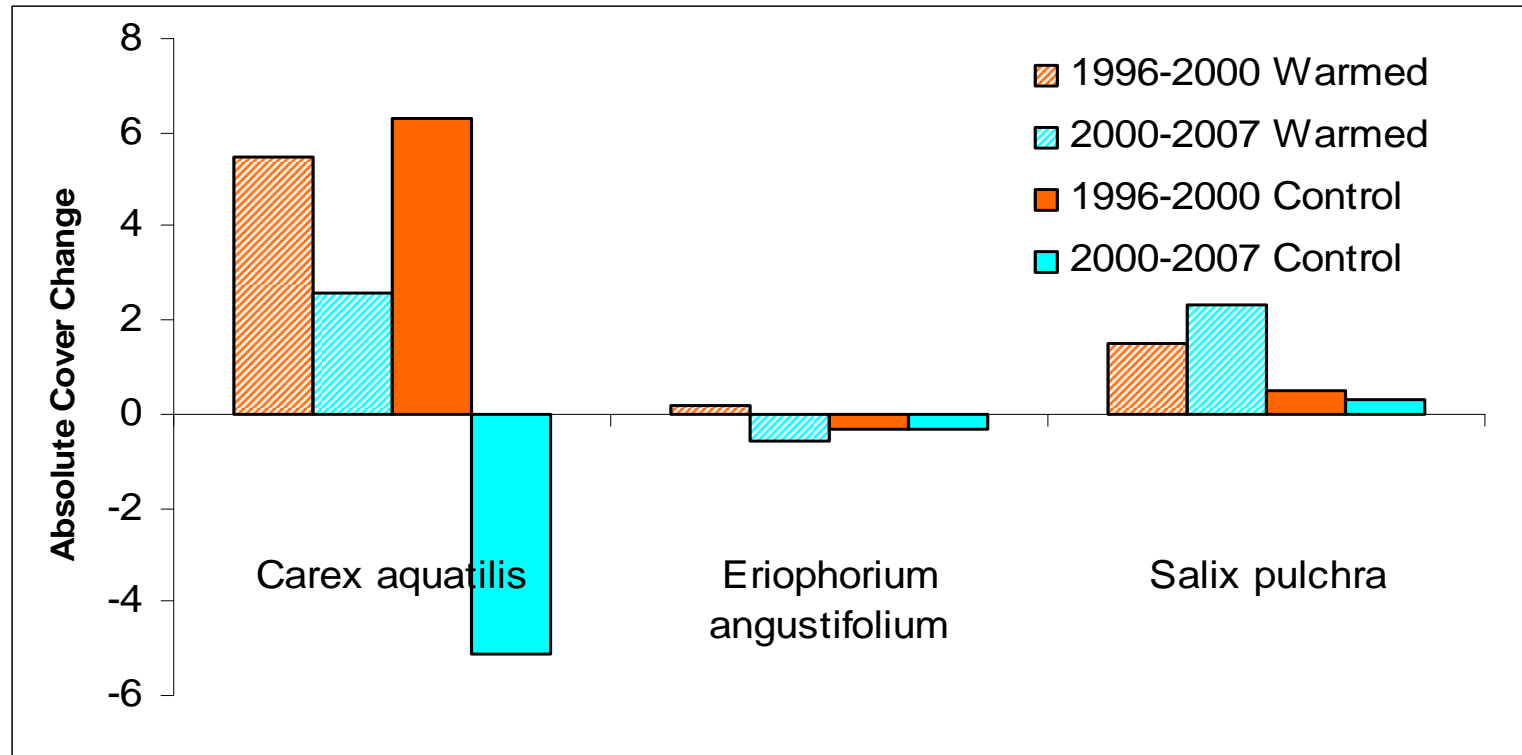
Graminoids and Shrubs show increase in cover in warmed and control plots

# Wet Site Select Species Absolute Cover

1996-2007



## Wet Site Select Species Cover Change 1996-2007



*C. aquatilis* shows increases with warming, contradicting response in control plots

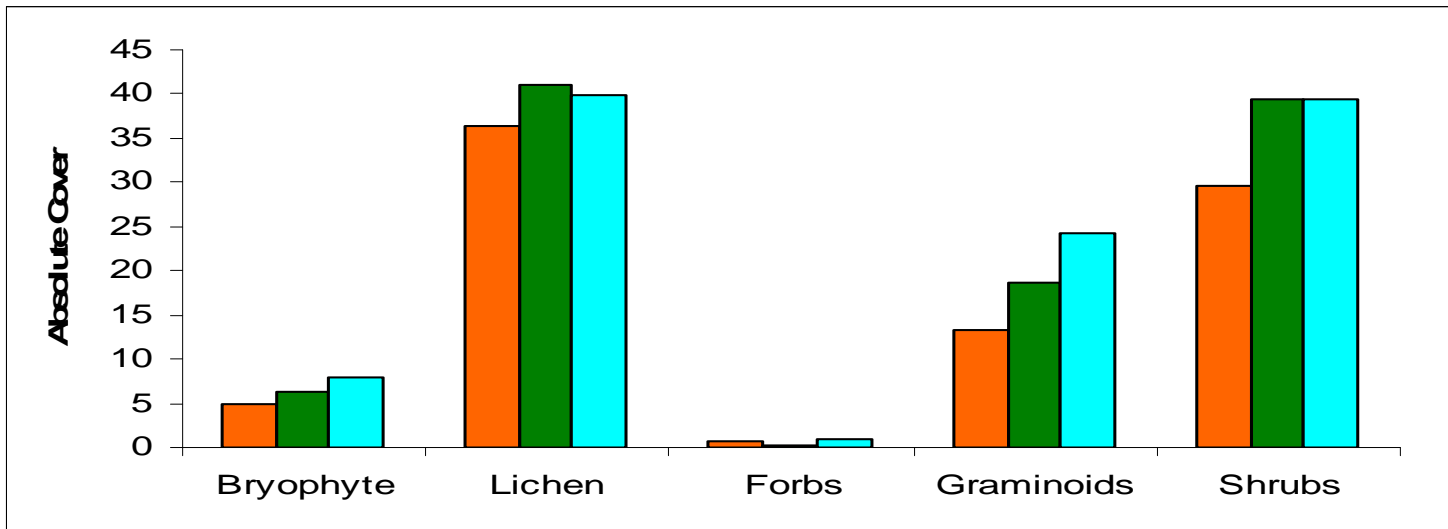
*E. angustifolium* shows contradicting response to warming and slight decrease in control plots

*S. pulchra* shows increases in warmed and control plots

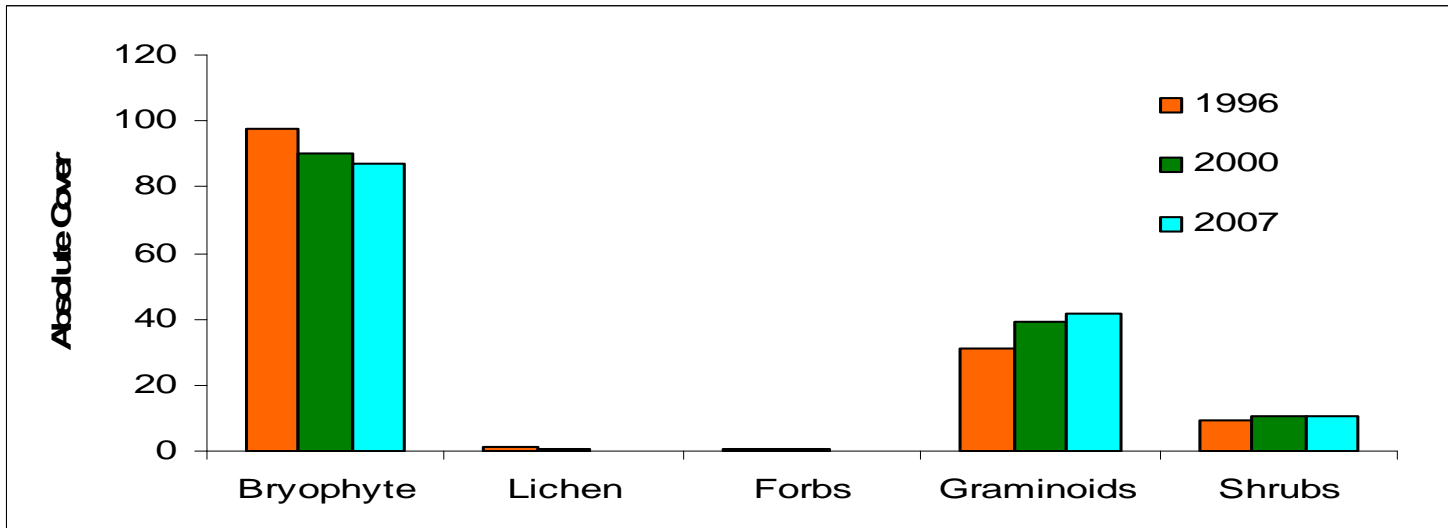


# Control Plots Only

1996-2007



## Dry Site



## Wet Site

# Conclusions

**Many growth forms showed little or no difference in cover when comparing all contacts to top/bottom contacts only**

**Graminoids and Shrubs showed the most difference**

**Most growth forms showed little or no difference in cover between 1996 and 2007 due to warming**

**Graminoids and Shrubs consistently increased in response to warming**

**Most growth forms showed little or no difference between 1996 and 2007 in control plots**

**Graminoids and Shrubs showed a overall net increase**

# Future Plans for Project

**Analyze 2008 samplings of Barrow, AK Wet and Dry Sites**

**Analyze aboveground Biomass samplings from all Barrow and Atqasuk Sites**



# Acknowledgements

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**Questions?**