

**Mount Mansfield Science and Stewardship Center
2015 Planning Survey Report**



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Introduction

A group of organizations from the public and private sectors has launched an effort to establish a hub of mountain science and stewardship in the northern Green Mountains of Vermont.

Cooperators in the enterprise include: the University of Vermont (UVM), the Vermont Center for Ecostudies, the Vermont Department of Forests, Parks and Recreation, the Vermont Monitoring Cooperative (VMC), and the Mount Mansfield Company. The partnering institutions envision the Mount Mansfield Science and Stewardship Center as a community of scholars, educators, and natural resource managers working alongside students and visitors to understand and sustain the vitality of mountain ecosystems.

The Mansfield Center's mission is to promote the health of northeastern mountain ecosystems by catalyzing collaborative science and stewardship on Mount Mansfield. Its goals are:

- to advance interdisciplinary research and long-term monitoring of mountain ecosystems and changes affecting mountain flora and fauna;
- to develop, implement, and demonstrate stewardship actions that lead to improved conservation of mountain environments; and
- to provide place-based education and outreach on mountain ecology, conservation issues, and stewardship.

The foundation for this work consists of: 25 years of VMC monitoring data spanning air, forest, soil, water, and wildlife; UVM research and education programs that extend from the bottom of Lake Champlain to Vermont's highest summit; and a tradition of information-sharing and networking.

Since 2012, Mansfield Center cooperators have held two scoping workshops, completed a feasibility study, and produced an organizing framework for science, stewardship and education programs. They have also discussed the role of a mountain field station with local to international stakeholders, including the Organization of Biological Field Stations and the Global Network of Mountain Observatories. These discussions have led to the initiation of a formal strategic-planning phase that involves the preparation of detailed program, facilities, and business plans.

Each of these documents calls for an accounting of current research, education, and stewardship activities on Mount Mansfield. Planning must also incorporate information about the level of interest, among prospective users, in new programs, services, and facilities currently under consideration. The purpose of the 2015 Planning Survey was to gather information about ongoing and potential uses of the mountain's living laboratory in order to guide the development of a comprehensive, five-year strategic plan.

Survey Methods

Working in concert with the Mansfield Center Leadership Team, I prepared a 23-question survey for circulation via an online platform (<https://www.surveymonkey.com>). To develop a survey pool, we drew from a variety of sources, including: the VMC and Mansfield Center contact databases, the OBFS member station database, the contact list from a 2011 workshop to establish alpine research priorities in the Northeast, staff directories for the Vermont Agency of Natural Resources and the US Forest Service, as well as directories for colleges, universities, nature centers, and environmental organizations located primarily in New England and eastern New York. On November 6th, we invited 520 scientists, educators, and natural resource

managers to participate in the survey. We issued reminders to complete the survey on November 24th and on December 2nd and closed the survey on December 4th.

Profile of Respondents

During the 29 days when the survey was active, we received 100 responses for a response rate of 19.2%. Of these, 82 responses originated from individuals working in Vermont. As a group, the respondents represent at least 44 different institutions based in five states and the province of Quebec. Approximately half of the respondents (53) are affiliated with a public or private university or college (Table 1). Government agencies and not-for-profit organizations were represented by 23 and 18 respondents, respectively.

Table 1. Organizational affiliations of survey respondents

Affiliation	Count
Public university or college	43
Independent not-for-profit organization	18
State agency	16
Private university or college	10
Federal agency	7
Other	6

Half of the survey participants have led or participated in fieldwork on Mount Mansfield and at least twenty-seven of them are currently involved in projects on the mountain. Approximately half of the respondents work within an hour of Stowe, Vermont, a town located to the east of the mountain from which a toll road ascends to the ridgeline. A large majority of the respondents (84%) work within two hours of Stowe.

Sixty survey participants identified “Research and/or Monitoring” as one of their primary professional fields. Natural resource management and education were also commonly identified (Table 2).

Table 2. Professional fields identified by survey respondents

Professional Field	Count
Research and/or monitoring	60
Natural resources management	46
Education	44
Environmental regulation	10
Recreation management	8
Engineering	2
Other	18

Results

Responses to all questions are summarized in tables and figures appended to this report. Here, I present nine key findings that pertain most directly to program, facilities, and business planning.

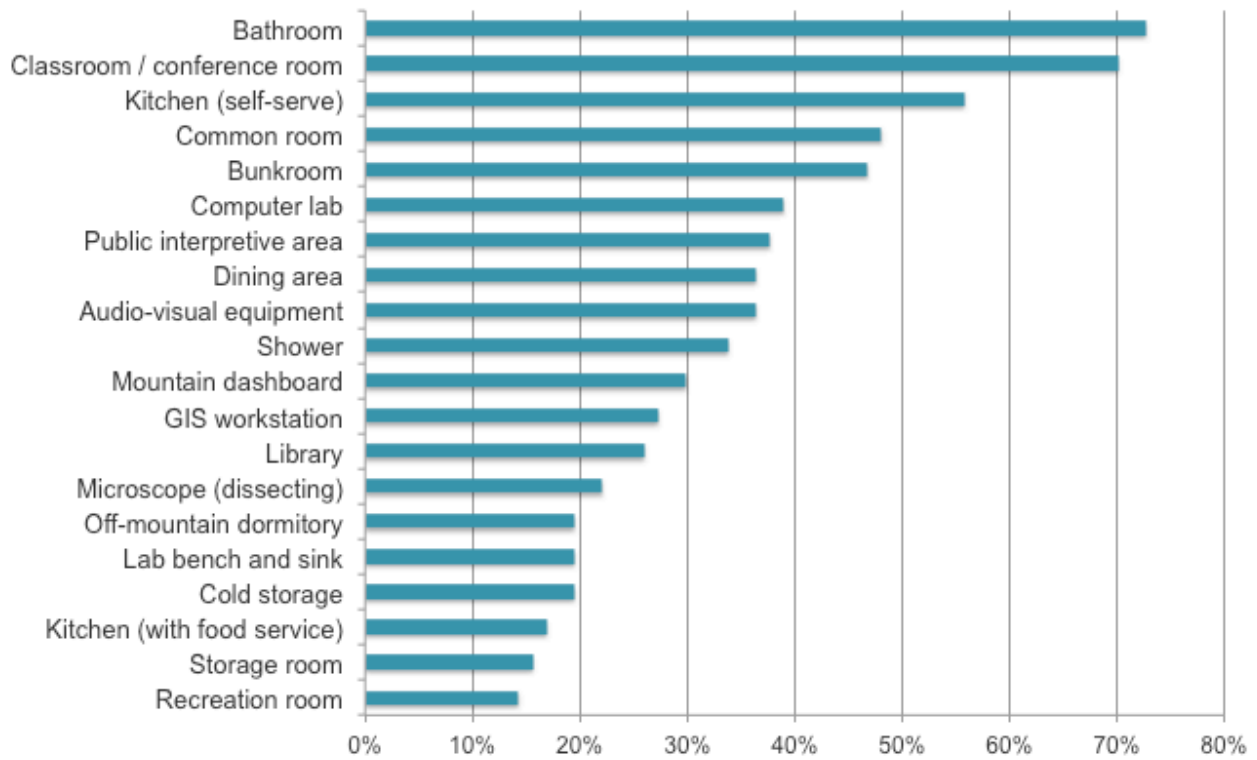
1. The expertise of prospective Mansfield Center users spans more than 30 academic and professional disciplines.

Table 3. Top 13 areas of expertise identified by survey respondents

Area of Expertise	Count
Natural resource management	34
Forest science	27
Botany or plant ecology	25
Environmental studies	25
Zoology or wildlife ecology	20
Restoration ecology	10
Climatology	10
Education	10
Organismal biology	9
Atmospheric chemistry	8
Geology	8
Hydrology	8
Recreation management	8

2. Interest in basic residential and educational infrastructure is high relative to interest in laboratory or storage facilities.

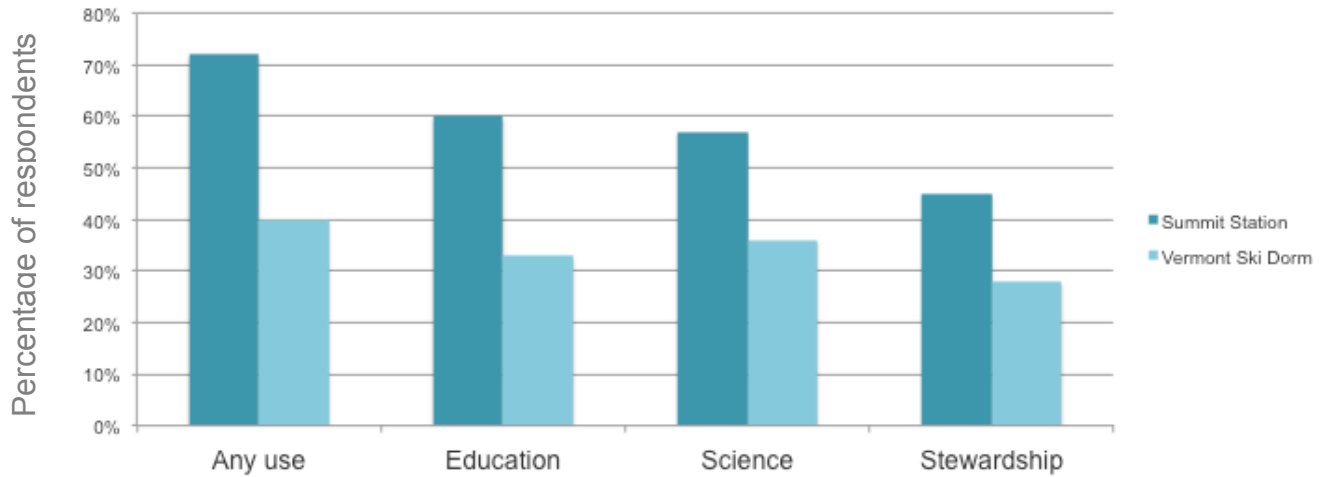
Figure 1. Level of interest in different types of facilities (based on 77 responses)



% of respondents indicating that they would be likely to use each type of facility

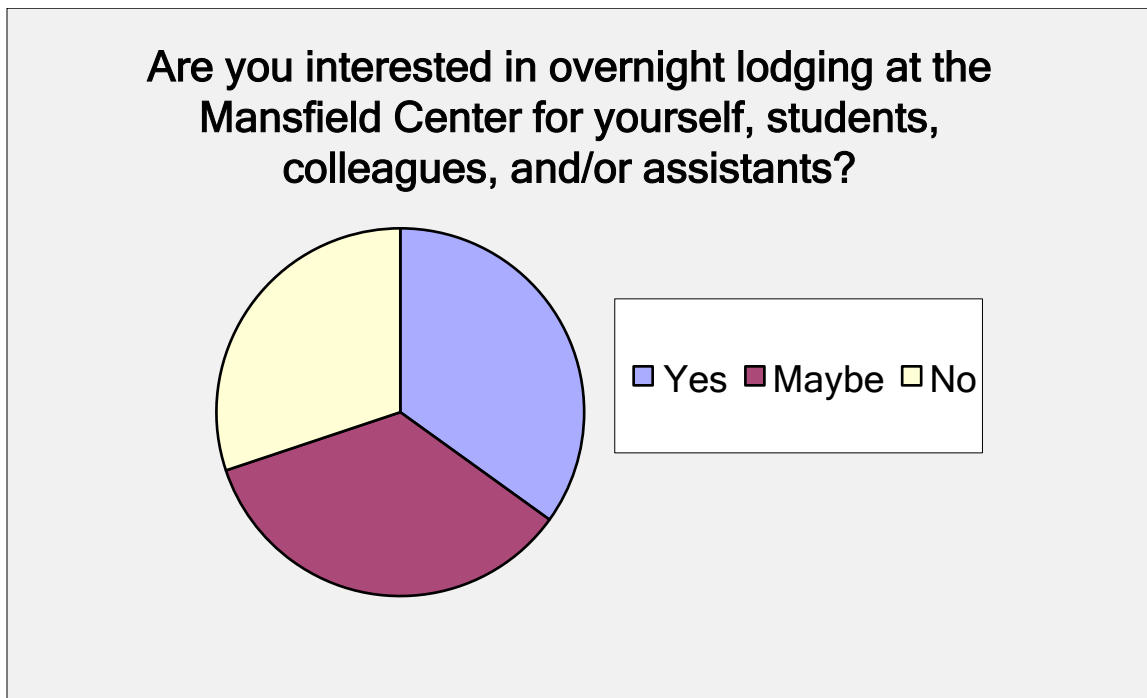
3. Respondents showed higher levels of interest in using a renovated Summit Station, located on a forested ridge at the top of the auto road (elevation 3,850 ft), compared to a renovated Vermont Ski Dorm, located at the base of the mountain on Vermont State Route 108.

Figure 2. Percentage of respondents (n=89) reporting high or very high interest in using the Summit Station compared to the Vermont Ski Dorm for education, science, and/or stewardship activities.



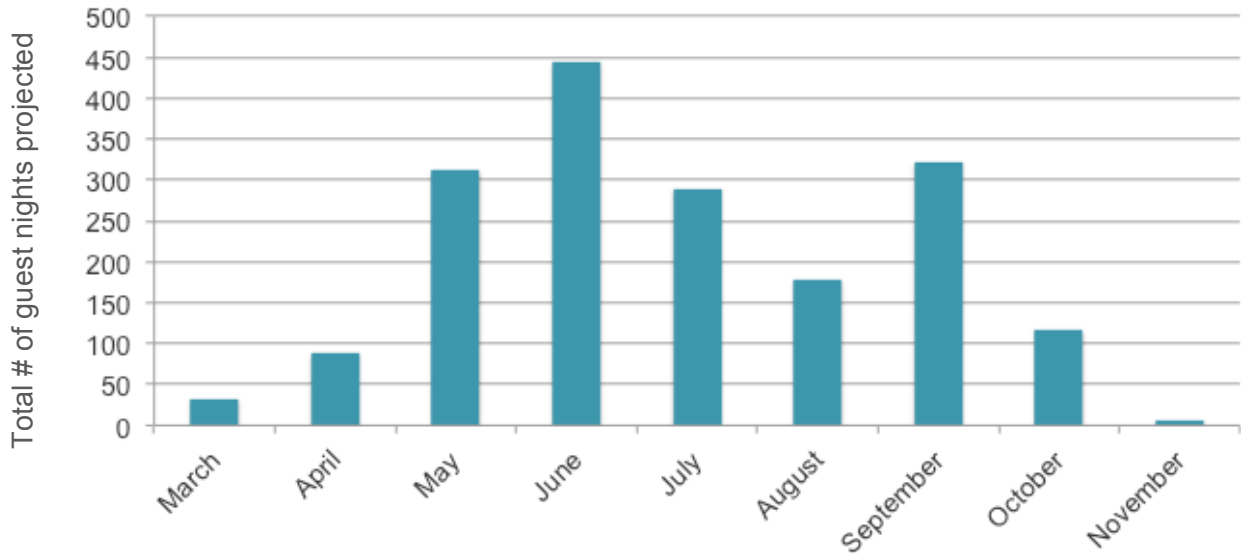
4. Thirty-five percent of respondents are interested in using the Mansfield Center for overnight lodging, while another 35% may be interested in overnight accommodations. The remaining 30% expressed interest in daytime use only.

Figure 3. Level of interest in overnight lodging (based on 83 responses)



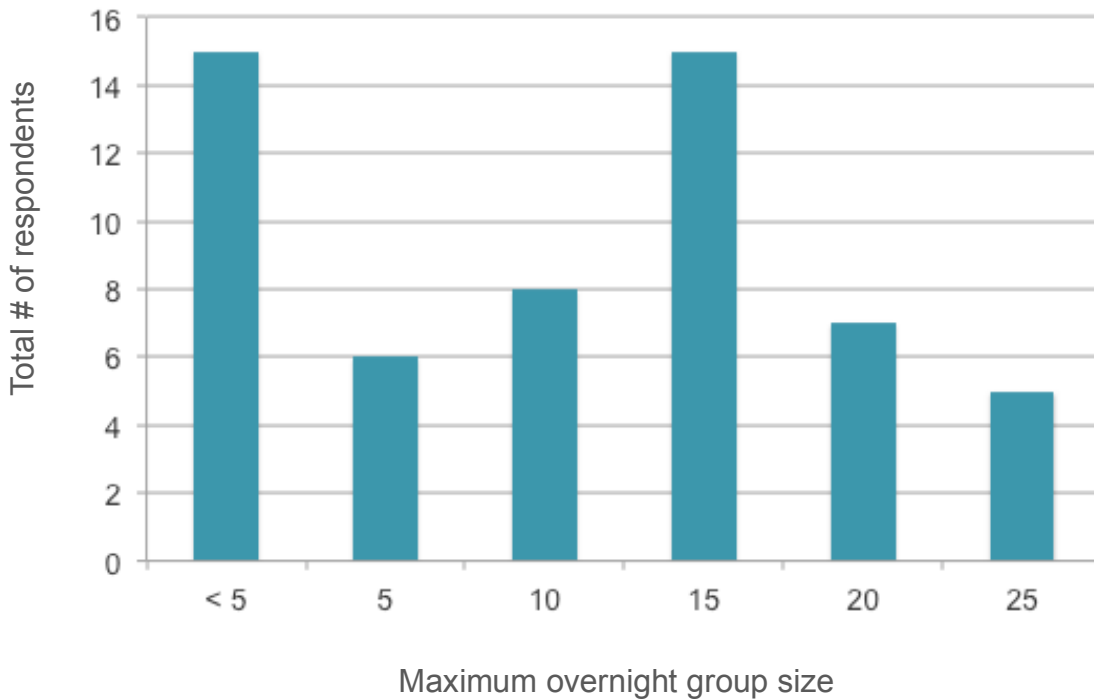
5. Respondents indicated a high demand for overnight use in May, June, July, and September with monthly guest-night projections ranging between 290 and 445 during these months.

Figure 4. Projections of overnight use by month



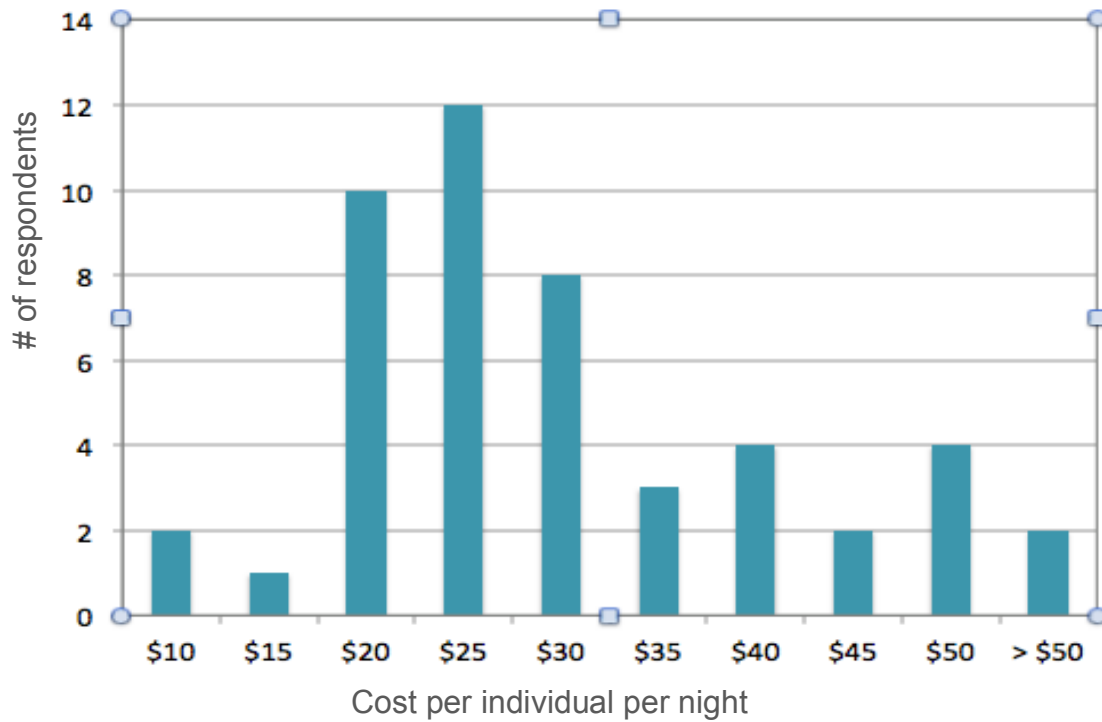
6. Half of those who anticipate using the Mansfield Center as an overnight facility project maximum group sizes of 10 people or fewer. The other half projected maximum group sizes of 15-25 people.

Figure 5. Maximum group sizes projected by likely overnight users



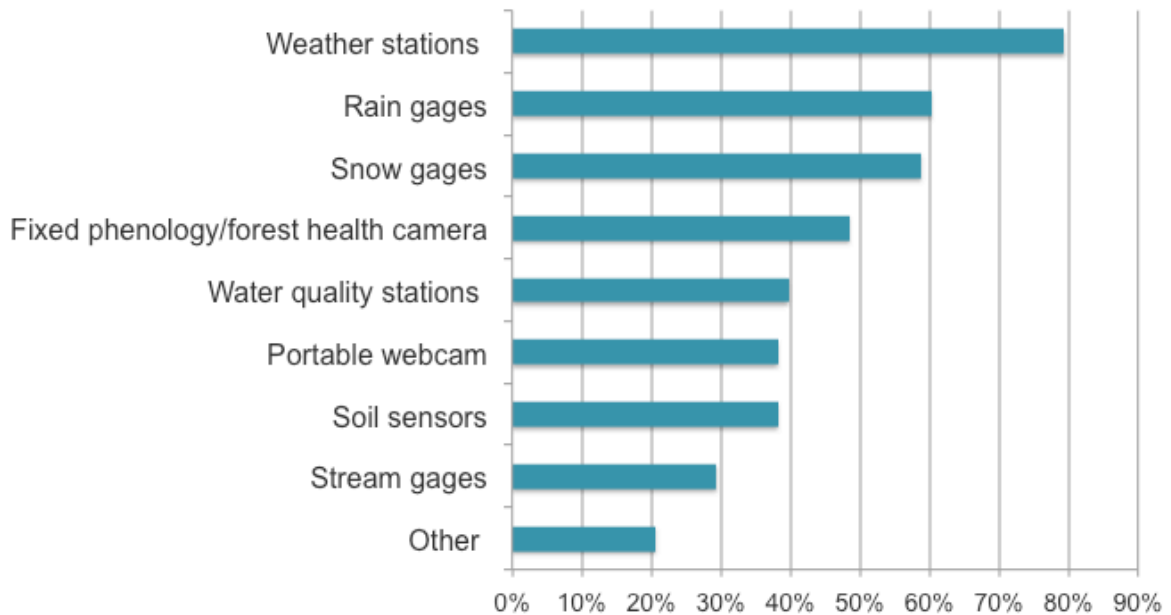
7. The maximum amount that prospective users are willing or able to pay for overnight lodging ranges from \$10 to \$100. Sixty-nine percent of the responses fell between \$10 and \$30 per night.

Figure 6. Nightly fees that users would be willing to pay for lodging at the Mansfield Center



8. There is a high level of interest in use of field instruments on the mountain, especially those designed to monitor meteorological and climatic variables.

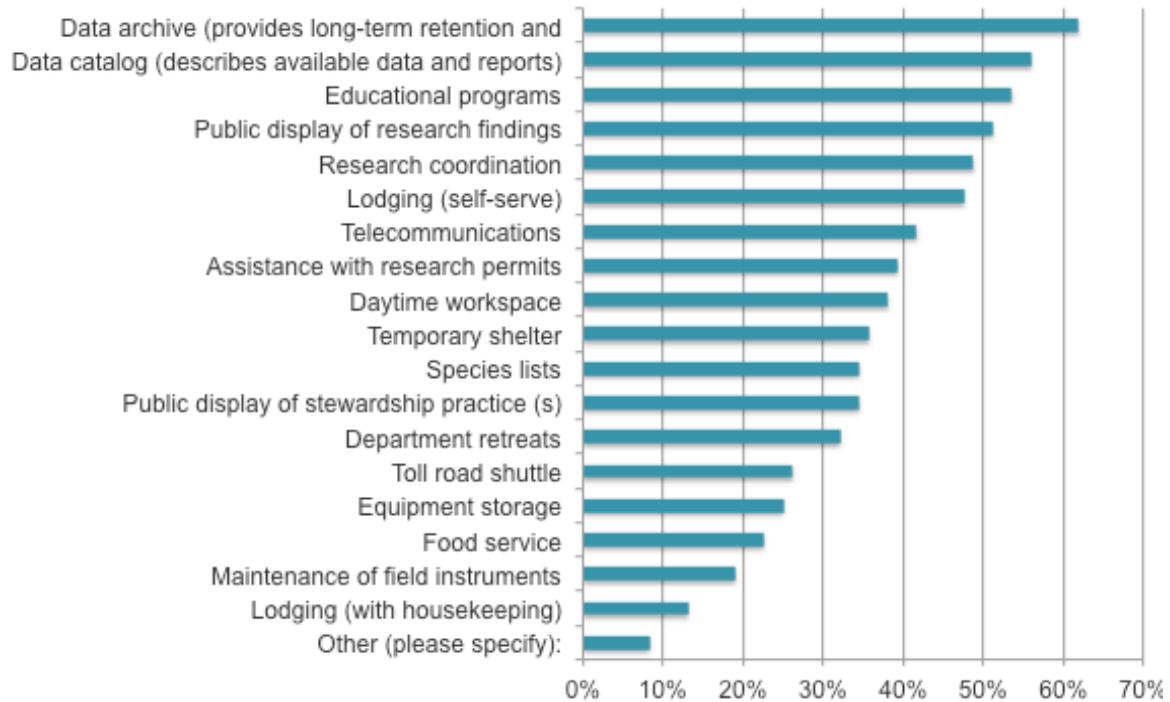
Figure 7. Level of interest in different field instruments (based on 68 responses)



% of respondents indicating that they would be likely to use each type of instrument

9. Prospective users are interested in a variety of services that could be provided by the Mansfield Center, especially data management, educational programs and displays, research coordination, and lodging.

Figure 8. Level of interest in different field station services (based on 84 responses)



% of respondents indicating that they would be likely to use each type of service

Conclusion

These data provide a basis for designing programs and facilities that support scientists, educators, and natural resource professionals currently working on Mount Mansfield and in other mountain environments. Mansfield Center planners can use this information to craft a strategic plan that addresses the expressed interests of prospective users. While these interests encompass a wide range of topics and use levels, they largely align behind the establishment of residential and educational space within the Summit Station. Monthly projections of user demand and information on user capacity to pay can be applied to on-site program development and financial planning. By allocating funding and effort according to user interests, Mansfield Center cooperators have the opportunity to realize the shared vision of a vibrant community collaborating to sustain the health of mountain ecosystems.

Acknowledgments

Several members of the Mansfield Center Leadership Team participated in the development of the planning survey, including Nancy Mathews, Allan Strong, and Rick Paradis (UVM Rubenstein School of Environment and Natural Resources), Jennifer Pontius and Carl Waite (Vermont Monitoring Cooperative), Chris Rimmer (Vermont Center for Ecostudies), and Sandy Wilmot (Vermont Department of Forests Parks and Recreation). Sandy Wilmot created the online questionnaire and April Berteau provided valuable assistance with its administration.

Appendix

Mount Mansfield Science and Stewardship Center Planning Survey

Q1 Participant information

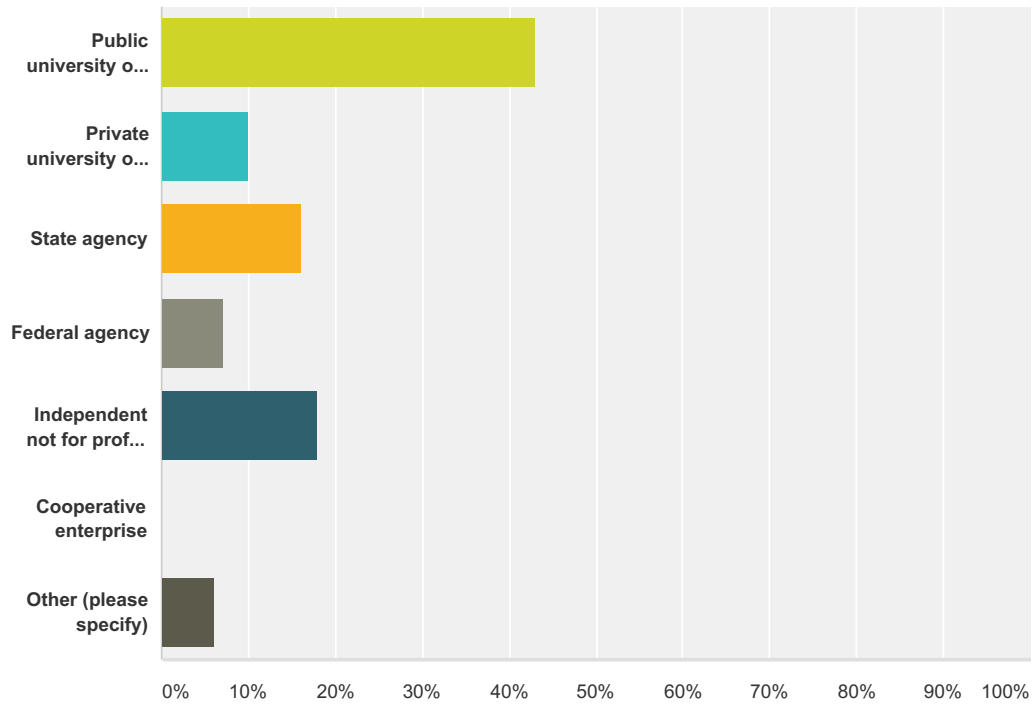
Answered: 94 Skipped: 6

Answer Choices	Responses	
First Name	100.00%	94
Last Name	98.94%	93
Job Title	96.81%	91
Organization	97.87%	92
Address 1	94.68%	89
Address 2	42.55%	40
Town/City	96.81%	91
State/Province	96.81%	91
ZIP/Postal Code	94.68%	89
Email	97.87%	92
Telephone	86.17%	81

Mount Mansfield Science and Stewardship Center Planning Survey

Q2 Your organization (check one)

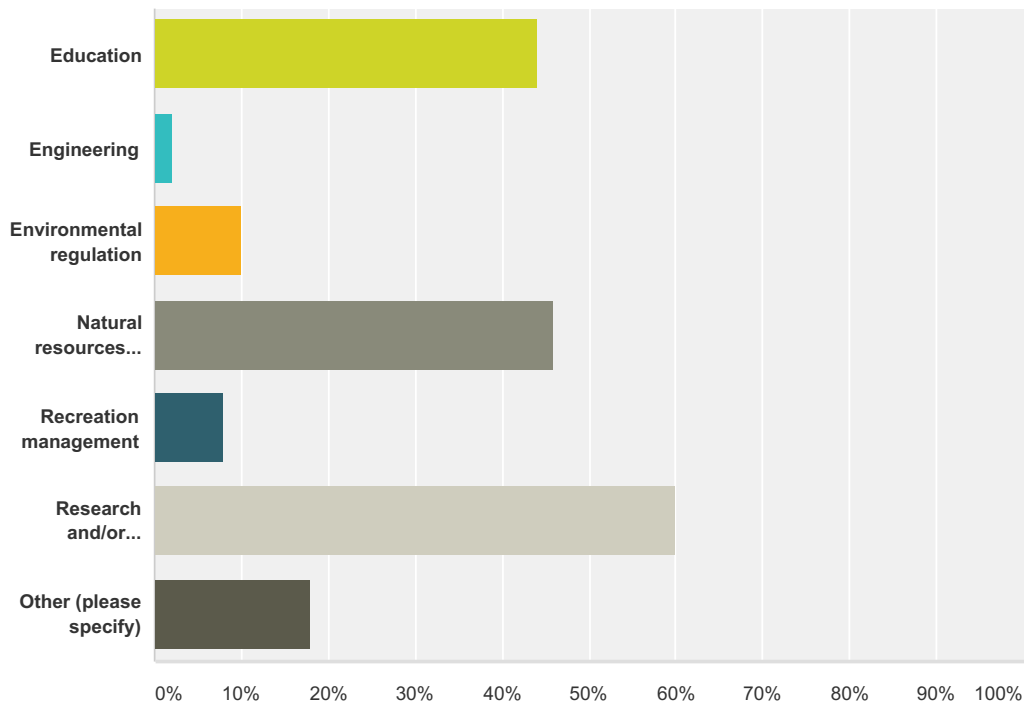
Answered: 100 Skipped: 0



Answer Choices	Responses	Count
Public university or college	43.00%	43
Private university or college	10.00%	10
State agency	16.00%	16
Federal agency	7.00%	7
Independent not for profit organization	18.00%	18
Cooperative enterprise	0.00%	0
Other (please specify)	6.00%	6
Total		100

Q3 Your professional field(s) (check all that apply)

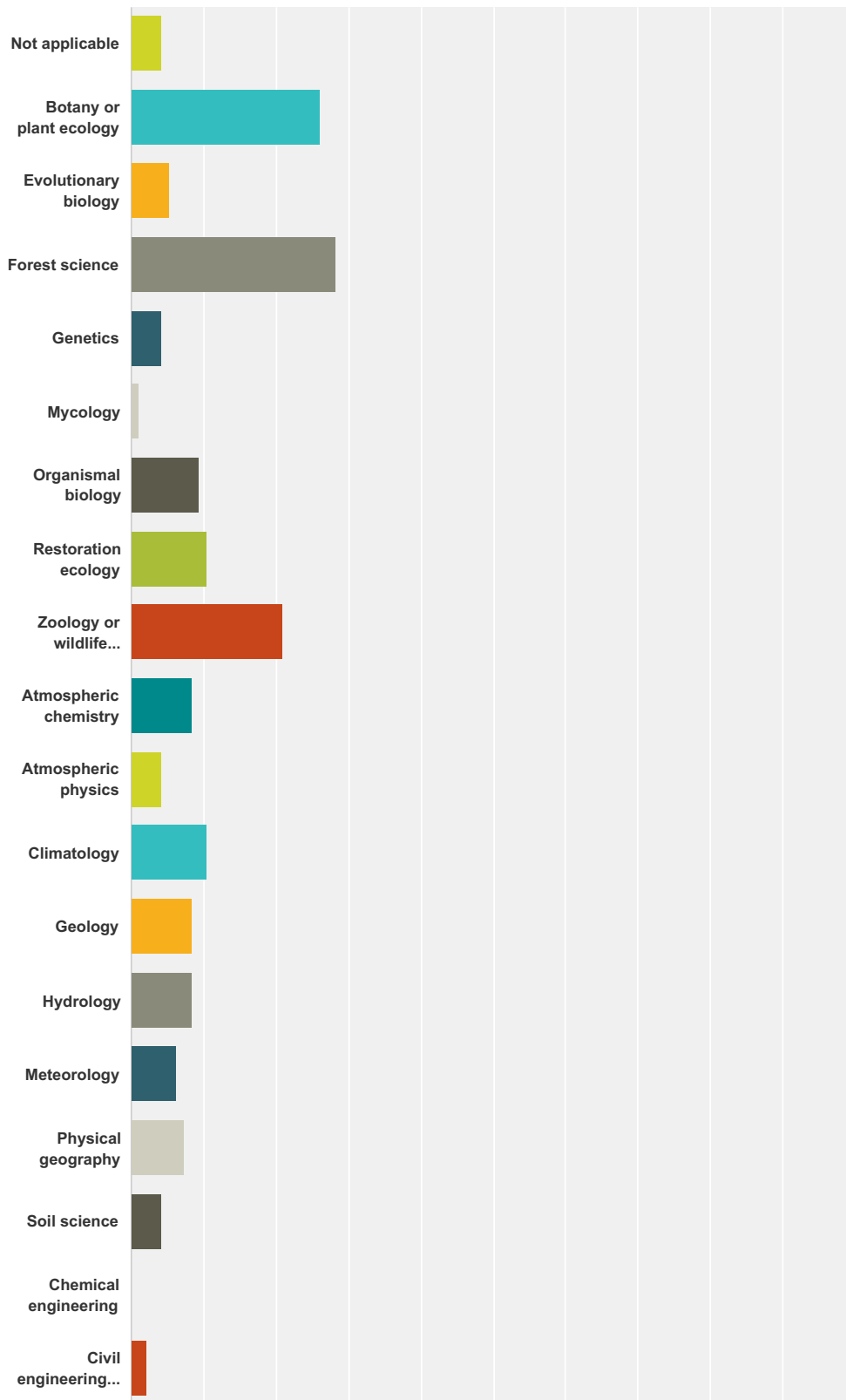
Answered: 100 Skipped: 0



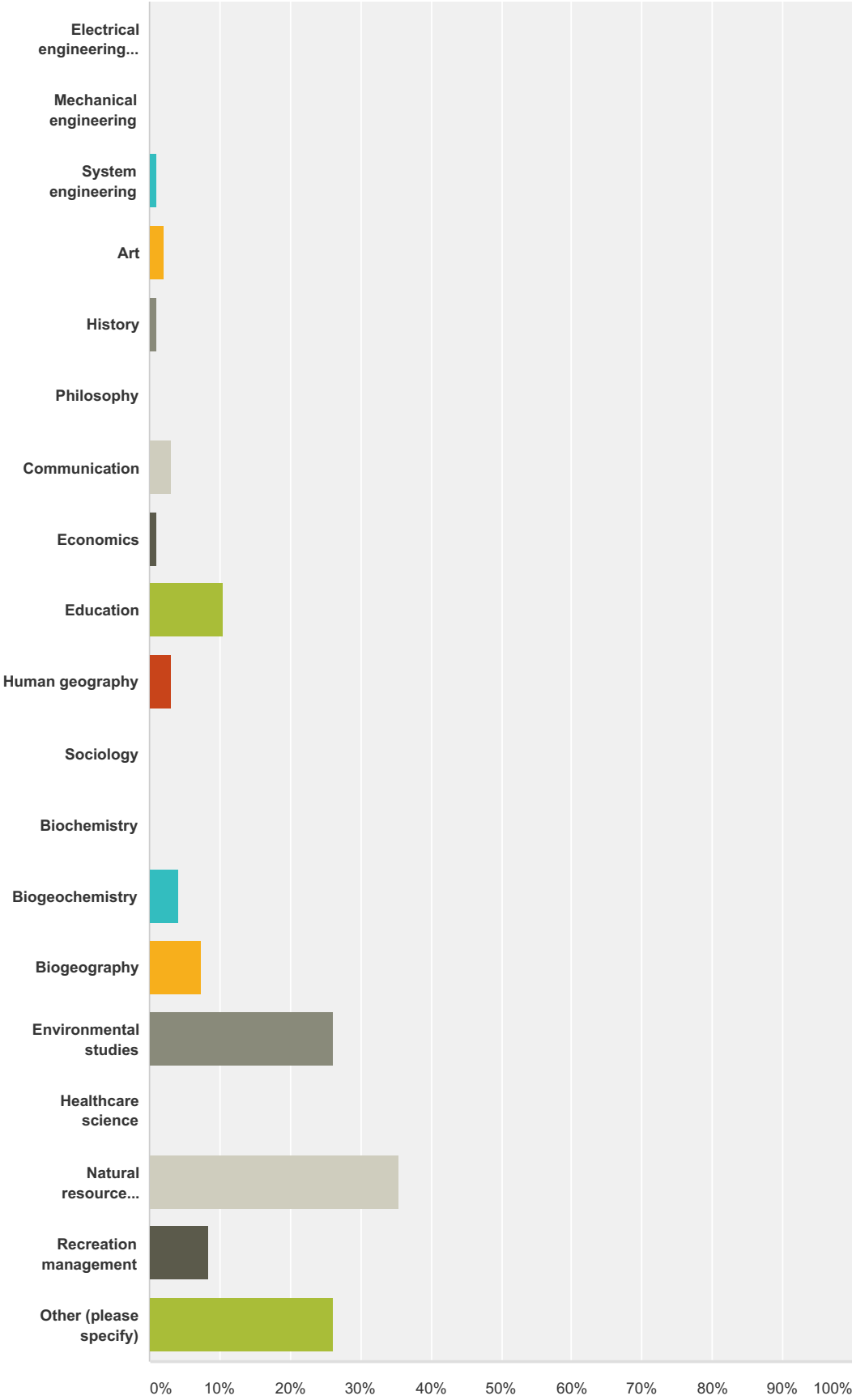
Answer Choices	Responses
Education	44.00% 44
Engineering	2.00% 2
Environmental regulation	10.00% 10
Natural resources management	46.00% 46
Recreation management	8.00% 8
Research and/or monitoring	60.00% 60
Other (please specify)	18.00% 18
Total Respondents: 100	

Q4 Your teaching or research specialty (check all that apply)

Answered: 96 Skipped: 4



Mount Mansfield Science and Stewardship Center Planning Survey



Mount Mansfield Science and Stewardship Center Planning Survey

Not applicable	4.17%	4
Botany or plant ecology	26.04%	25
Evolutionary biology	5.21%	5
Forest science	28.13%	27
Genetics	4.17%	4
Mycology	1.04%	1
Organismal biology	9.38%	9
Restoration ecology	10.42%	10
Zoology or wildlife ecology	20.83%	20
Atmospheric chemistry	8.33%	8
Atmospheric physics	4.17%	4
Climatology	10.42%	10
Geology	8.33%	8
Hydrology	8.33%	8
Meteorology	6.25%	6
Physical geography	7.29%	7
Soil science	4.17%	4
Chemical engineering	0.00%	0
Civil engineering (including environmental)	2.08%	2
Electrical engineering (including energy)	0.00%	0
Mechanical engineering	0.00%	0
System engineering	1.04%	1
Art	2.08%	2
History	1.04%	1
Philosophy	0.00%	0
Communication	3.13%	3
Economics	1.04%	1
Education	10.42%	10
Human geography	3.13%	3
Sociology	0.00%	0
Biochemistry	0.00%	0
Biogeochemistry	4.17%	4
Biogeography	7.29%	7
Environmental studies	26.04%	25

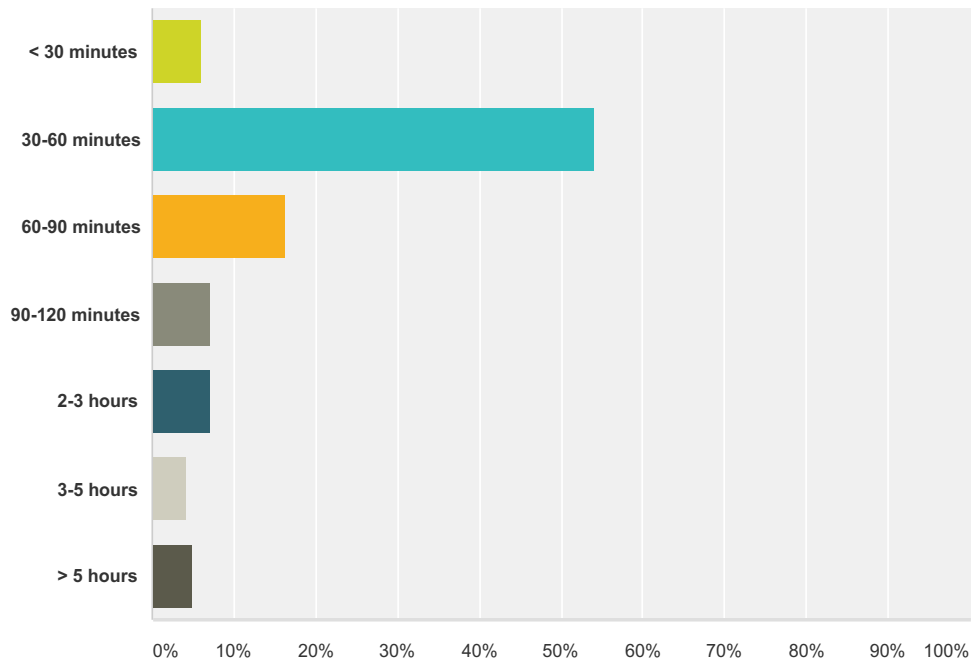
Mount Mansfield Science and Stewardship Center Planning Survey

Healthcare science	0.00%	0
Natural resource management	35.42%	34
Recreation management	8.33%	8
Other (please specify)	26.04%	25
Total Respondents: 96		

Mount Mansfield Science and Stewardship Center Planning Survey

Q5 Driving time from your workplace to Stowe, VT

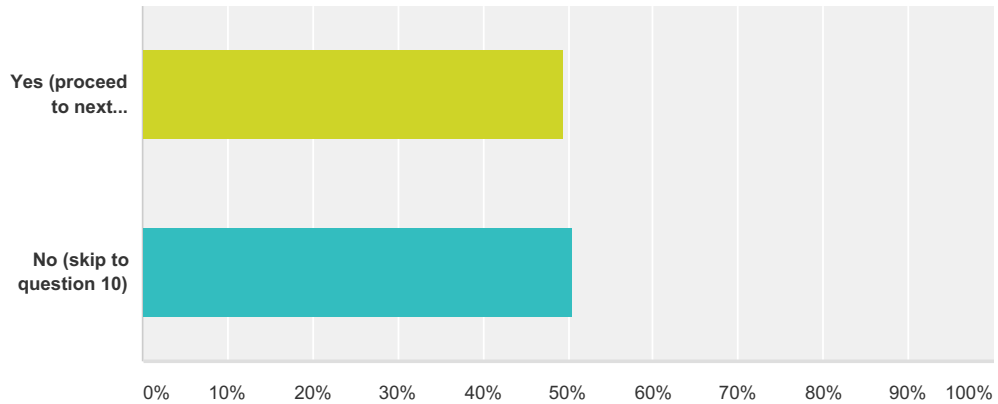
Answered: 98 Skipped: 2



Answer Choices	Responses	Count
< 30 minutes	6.12%	6
30-60 minutes	54.08%	53
60-90 minutes	16.33%	16
90-120 minutes	7.14%	7
2-3 hours	7.14%	7
3-5 hours	4.08%	4
> 5 hours	5.10%	5
Total		98

Q6 Have you ever led or participated in field-based science, education, or stewardship activities on Mount Mansfield, including areas above 1,200 feet in elevation?

Answered: 95 Skipped: 5

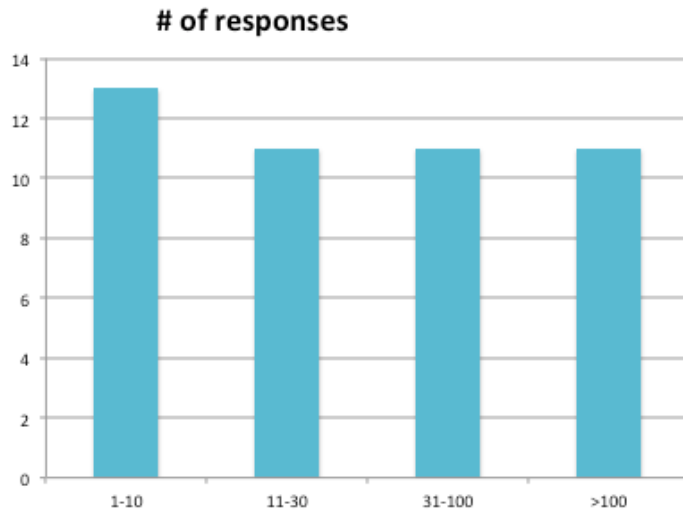


Answer Choices	Responses
Yes (proceed to next question)	49.47% 47
No (skip to question 10)	50.53% 48
Total	95

Q8 Estimate the number of days on which you have led and/or participated in such activities. Please provide a single value, summing days across all years.

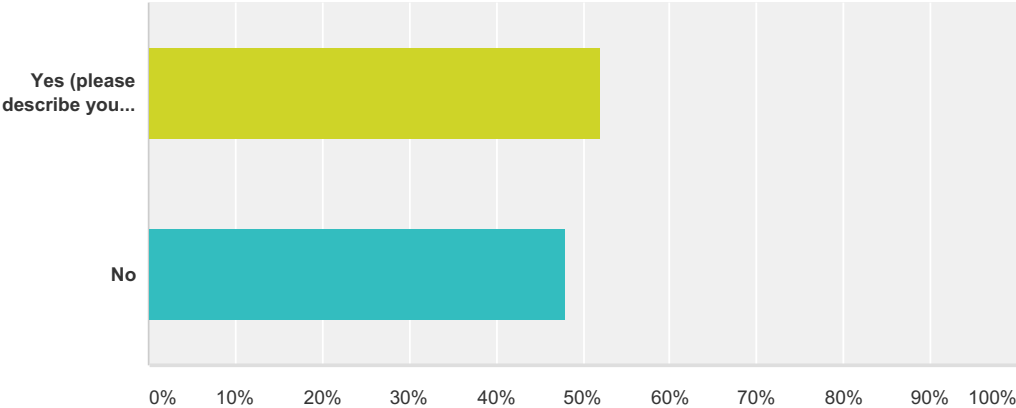
Answered: 46 Skipped: 54

Range = 1 to 2045 days
 Mean = 147.6
 SD = 335.7



Q9 Are you currently involved in any field-based science, education, or stewardship programs on Mount Mansfield?

Answered: 52 Skipped: 48

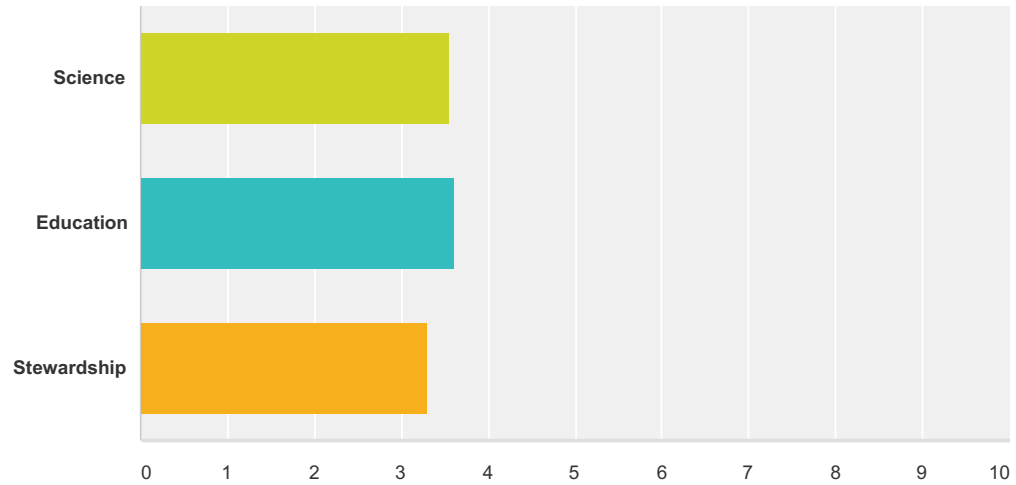


Answer Choices	Responses	
Yes (please describe your current activities on Mount Mansfield - 300 character limit)	51.92%	27
No	48.08%	25
Total		52

Mount Mansfield Science and Stewardship Center Planning Survey

Q10 Please rate your level of interest in using the SUMMIT STATION (3,850 feet) as a platform for place-based science, education, and stewardship activities.

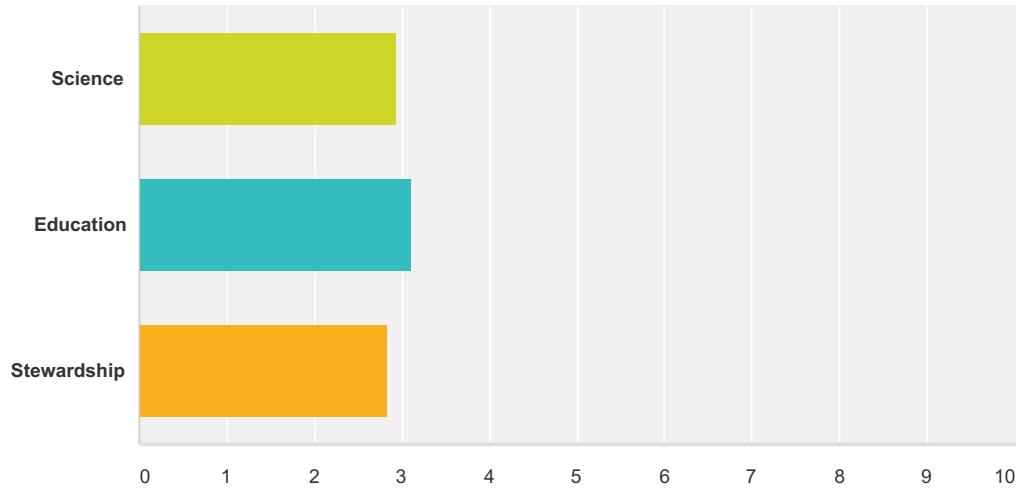
Answered: 89 Skipped: 11



	Very Low	Low	Moderate	High	Very High	Total	Weighted Average
Science	8.99% 8	12.36% 11	21.35% 19	30.34% 27	26.97% 24	89	3.54
Education	6.74% 6	8.99% 8	24.72% 22	34.83% 31	24.72% 22	89	3.62
Stewardship	10.11% 9	15.73% 14	29.21% 26	23.60% 21	21.35% 19	89	3.30

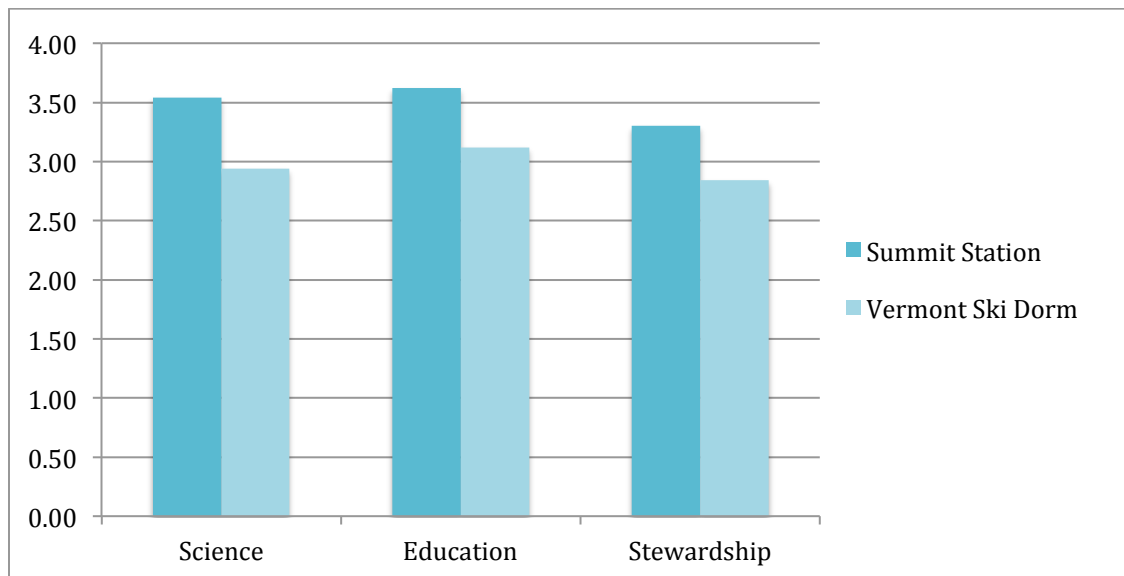
Q11 Please rate your level of interest in using the VERMONT SKI DORM (1,410 feet) as a platform for place-based science, education, and stewardship.

Answered: 89 Skipped: 11



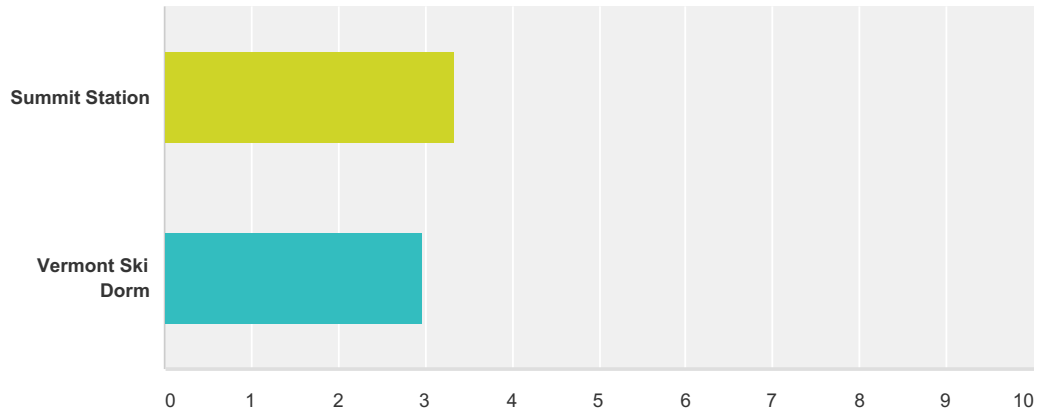
	Very Low	Low	Moderate	High	Very High	Total	Weighted Average
Science	14.61% 13	23.60% 21	25.84% 23	24.72% 22	11.24% 10	89	2.94
Education	8.99% 8	14.61% 13	43.82% 39	20.22% 18	12.36% 11	89	3.12
Stewardship	15.73% 14	21.35% 19	34.83% 31	19.10% 17	8.99% 8	89	2.84

Direct comparison of average ratings derived from questions 10 and 11.



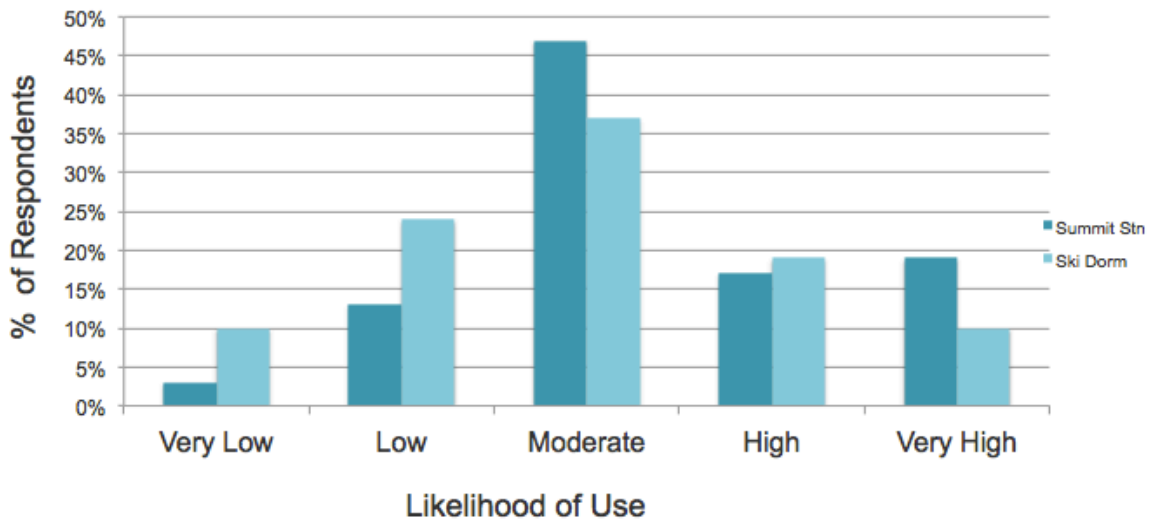
Q12 Considering your interest level and your program's resources, what is the likelihood that you would make use of a science and stewardship center at each location.

Answered: 89 Skipped: 11



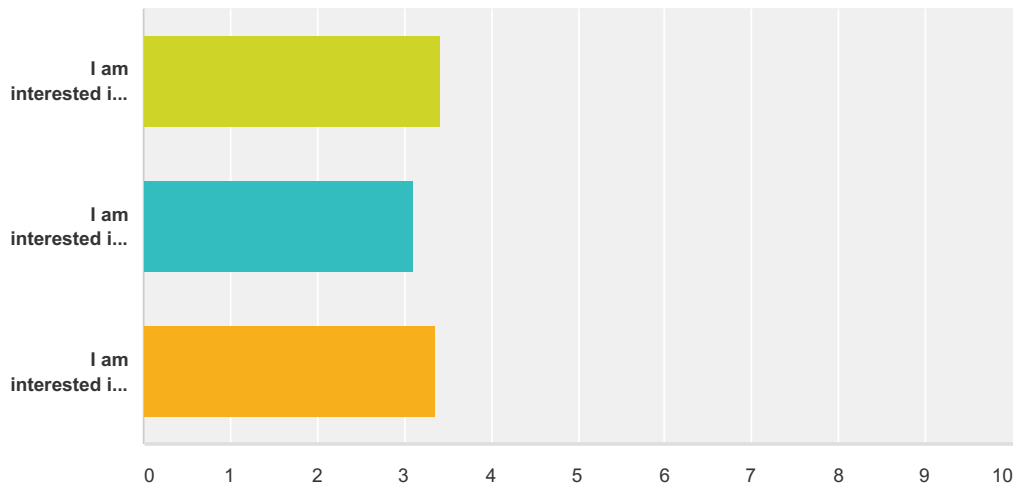
	Very Low	Low	Moderate	High	Very High	Total	Weighted Average
Summit Station	3.37% 3	13.48% 12	47.19% 42	16.85% 15	19.10% 17	89	3.35
Vermont Ski Dorm	10.11% 9	23.60% 21	37.08% 33	19.10% 17	10.11% 9	89	2.96

Likelihood of Use (Summit Station vs. Ski Dorm)



Q13 Please rate your level of agreement with the following statements.

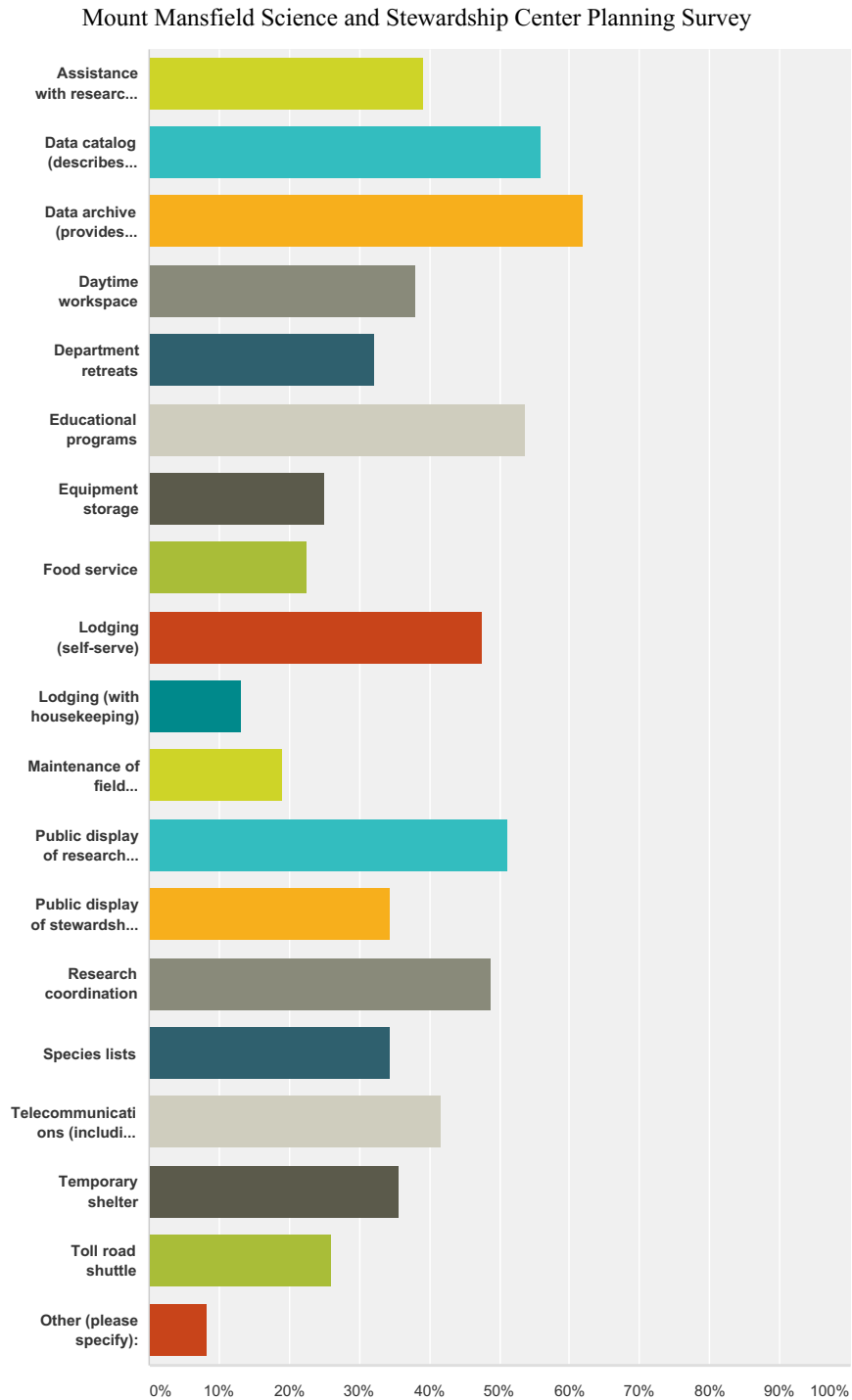
Answered: 87 Skipped: 13



	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total	Weighted Average
I am interested in bringing a class to The Mansfield Center for a day trip.	8.33% 7	10.71% 9	29.76% 25	33.33% 28	17.86% 15	84	3.42
I am interested in bringing a class to The Mansfield Center for an overnight or longer trip.	12.05% 10	14.46% 12	33.73% 28	30.12% 25	9.64% 8	83	3.11
I am interested in teaching or co-teaching a field course administered by The Mansfield Center.	5.81% 5	11.63% 10	39.53% 34	26.74% 23	16.28% 14	86	3.36

Q14 If made available at The Mansfield Center, which of the following services would you be likely to use?

Answered: 84 Skipped: 16

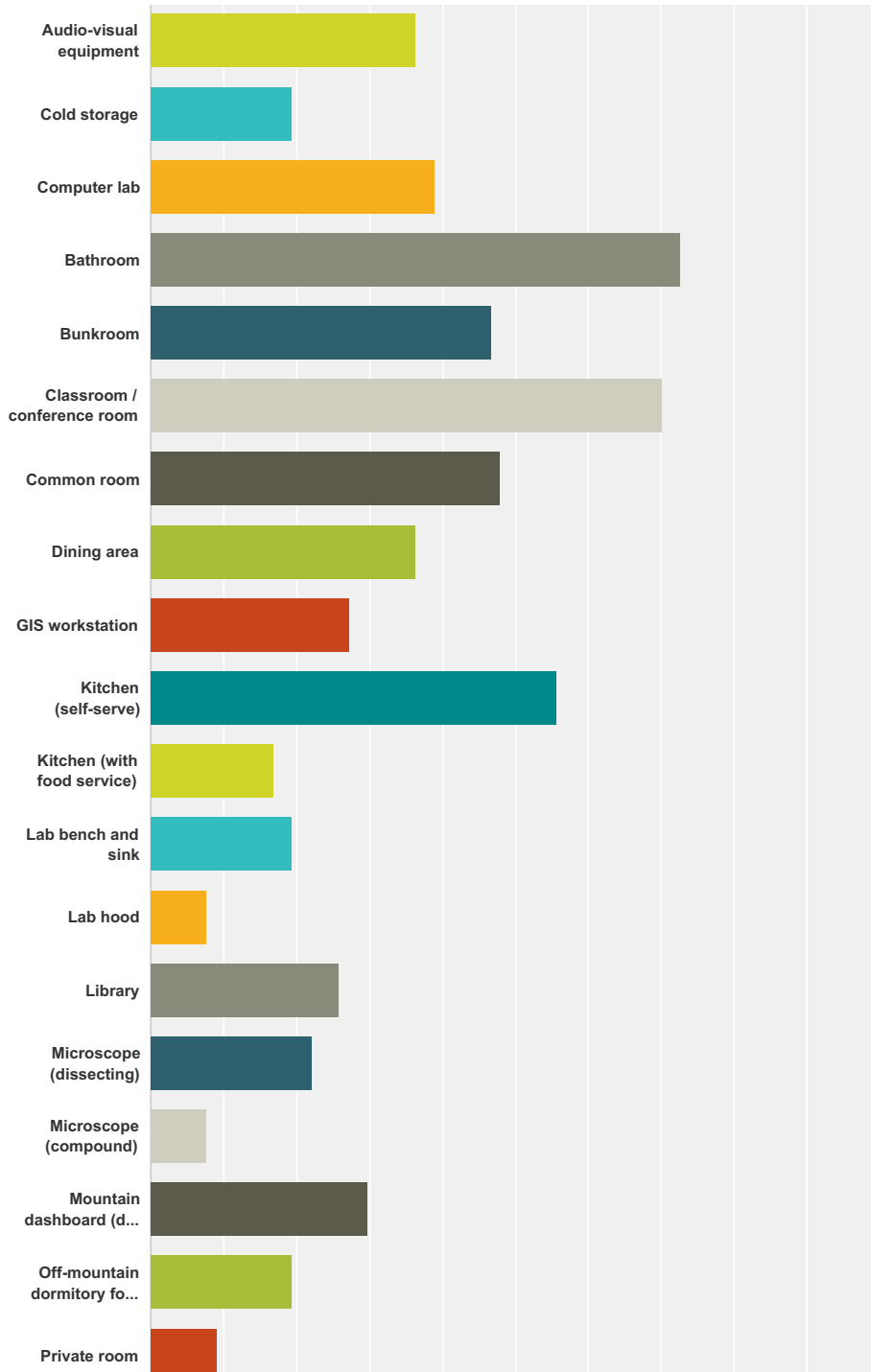


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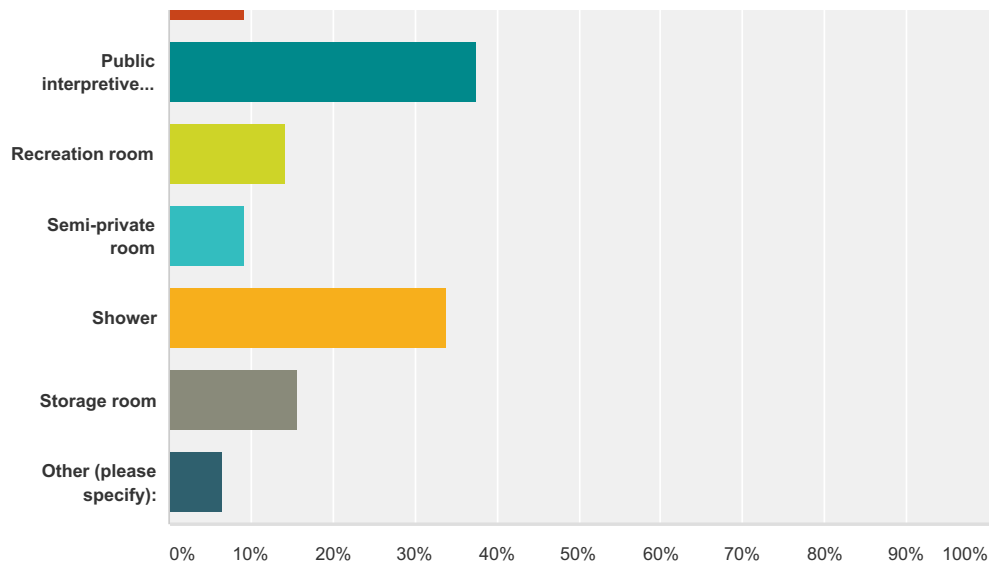
Data catalog (describes available data and reports)	55.95%	47
Data archive (provides long-term retention and access to data)	61.90%	52
Daytime workspace	38.10%	32
Department retreats	32.14%	27
Educational programs	53.57%	45
Equipment storage	25.00%	21
Food service	22.62%	19
Lodging (self-serve)	47.62%	40
Lodging (with housekeeping)	13.10%	11
Maintenance of field instruments	19.05%	16
Public display of research findings	51.19%	43
Public display of stewardship practice (s)	34.52%	29
Research coordination	48.81%	41
Species lists	34.52%	29
Telecommunications (including high-speed internet)	41.67%	35
Temporary shelter	35.71%	30
Toll road shuttle	26.19%	22
Other (please specify):	8.33%	7
Total Respondents: 84		

Q15 If made available at The Mansfield Center, which of the following facilities and equipment would you be likely to use?

Answered: 77 Skipped: 23



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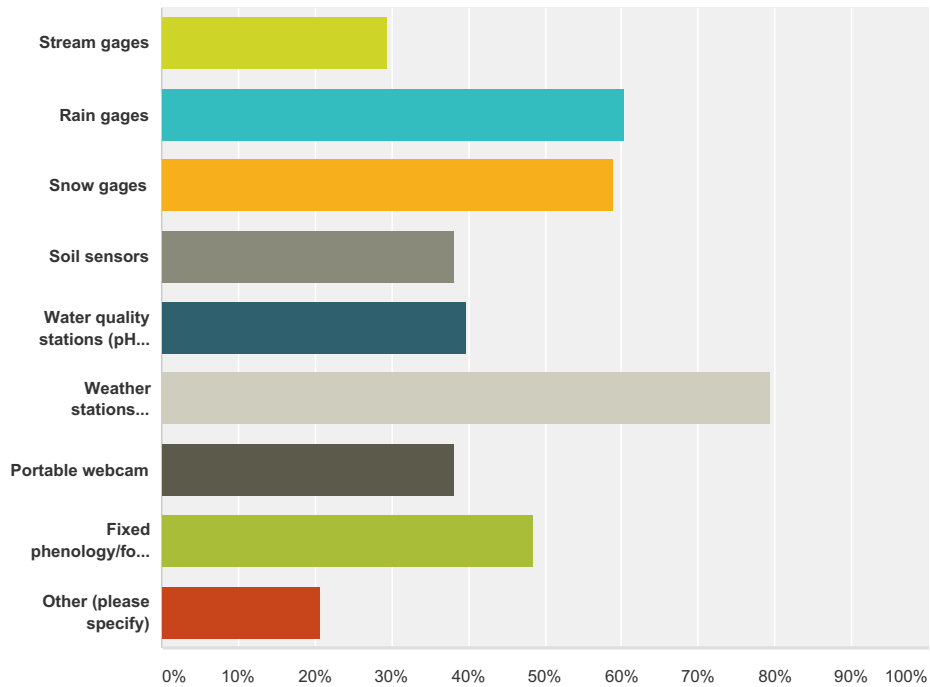
Answer Choices	Responses	
Audio-visual equipment	36.36%	28
Cold storage	19.48%	15
Computer lab	38.96%	30
Bathroom	72.73%	56
Bunkroom	46.75%	36
Classroom / conference room	70.13%	54
Common room	48.05%	37
Dining area	36.36%	28
GIS workstation	27.27%	21
Kitchen (self-serve)	55.84%	43
Kitchen (with food service)	16.88%	13
Lab bench and sink	19.48%	15
Lab hood	7.79%	6
Library	25.97%	20
Microscope (dissecting)	22.08%	17
Microscope (compound)	7.79%	6
Mountain dashboard (data feed from automated sensors)	29.87%	23
Off-mountain dormitory for large groups	19.48%	15
Private room	9.09%	7
Public interpretive area	37.66%	29
Recreation room	14.29%	11

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Semi-private room	9.09%	7
Shower	33.77%	26
Storage room	15.58%	12
Other (please specify):	6.49%	5
Total Respondents: 77		

Q16 If made available at The Mansfield Center, which of the following field instruments would you be likely to use?

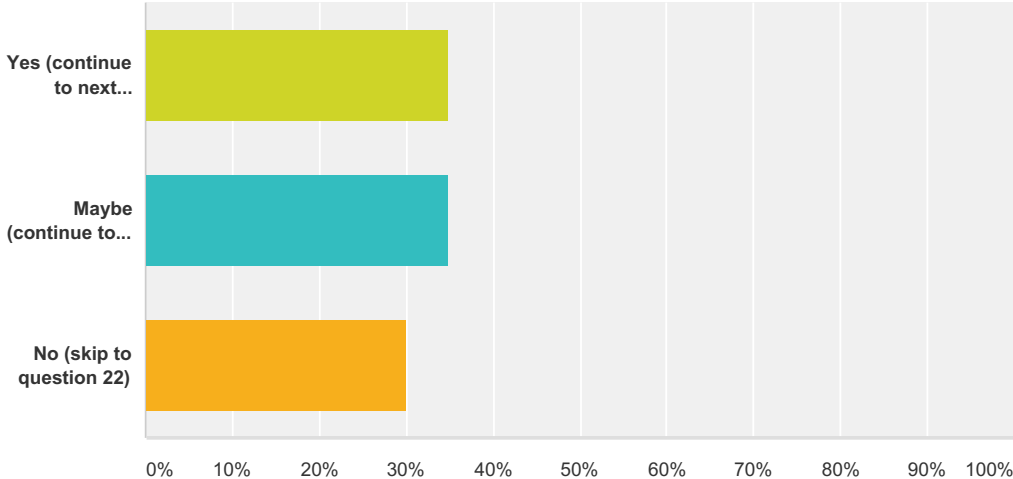
Answered: 68 Skipped: 32



Answer Choices	Responses
Stream gages	29.41% 20
Rain gages	60.29% 41
Snow gages	58.82% 40
Soil sensors	38.24% 26
Water quality stations (pH, conductivity, dissolved oxygen, temperature, cations, anions, nutrients)	39.71% 27
Weather stations (temperature, pressure, humidity, wind, precipitation, solar radiation, cloud ceiling, ultraviolet index, leaf wetness, soil moisture, etc)	79.41% 54
Portable webcam	38.24% 26
Fixed phenology/forest health camera	48.53% 33
Other (please specify)	20.59% 14
Total Respondents: 68	

Q17 Are you interested in overnight lodging at The Mansfield Center for yourself, students, colleagues, and/or assistants?

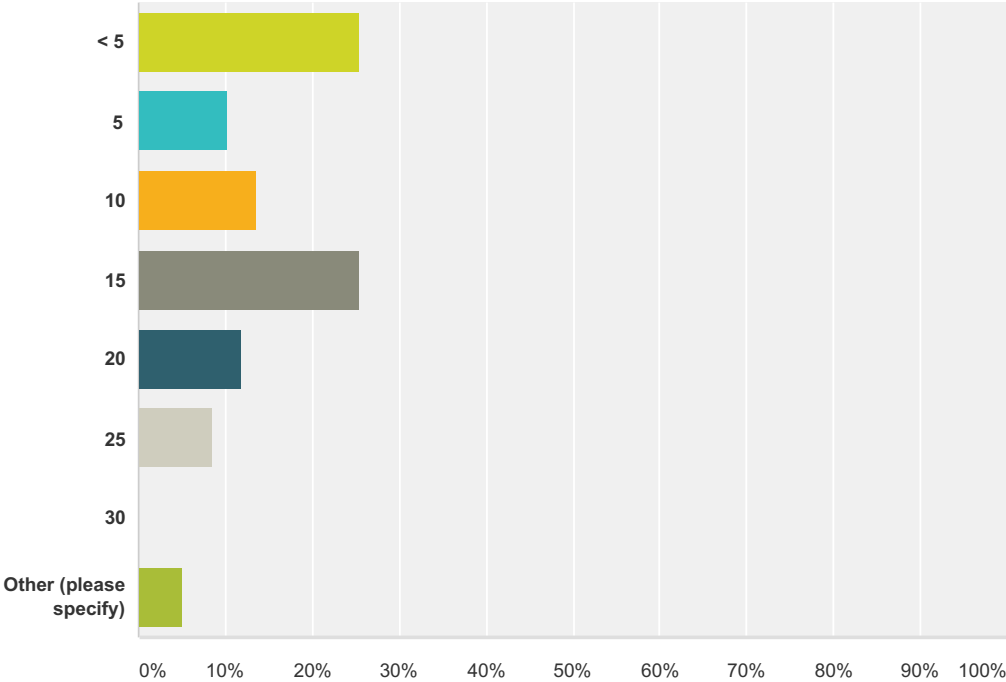
Answered: 83 Skipped: 17



Answer Choices	Responses	
Yes (continue to next question)	34.94%	29
Maybe (continue to next question)	34.94%	29
No (skip to question 22)	30.12%	25
Total		83

Q18 What is the maximum number of overnight occupants that would be accommodated at one time?

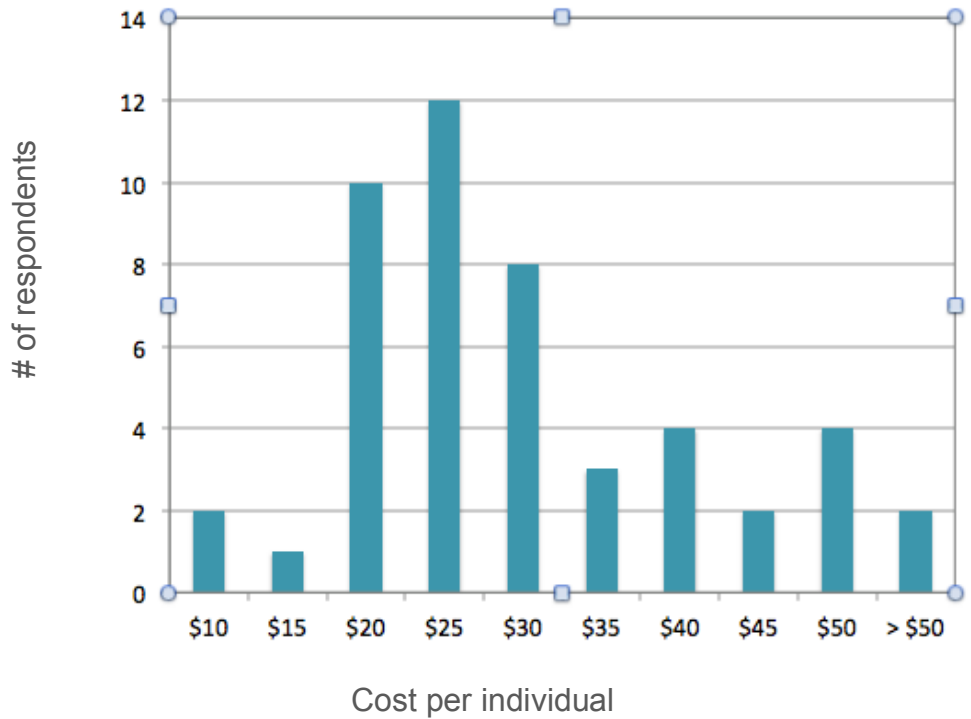
Answered: 59 Skipped: 41



Answer Choices	Responses	
< 5	25.42%	15
5	10.17%	6
10	13.56%	8
15	25.42%	15
20	11.86%	7
25	8.47%	5
30	0.00%	0
Other (please specify)	5.08%	3
Total		59

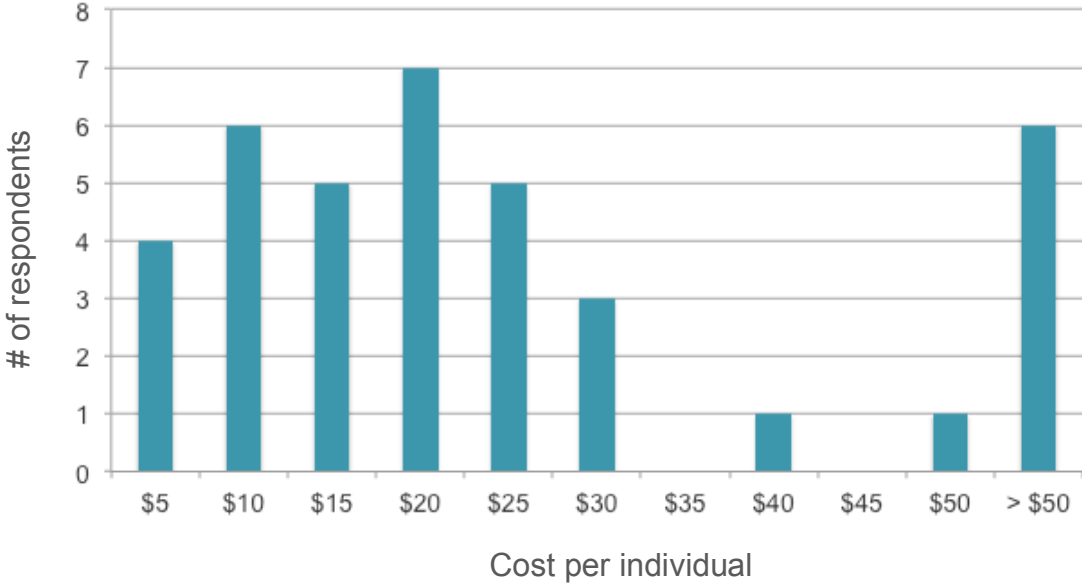
Q19 What is the maximum amount per individual that you would be willing to pay per night? (daytime use included, food service not included)

Answered: 52 Skipped: 48



Q20 What is the maximum amount per individual that you would be willing to pay for a day's use of laboratory, conference, and kitchen spaces? (lodging and food service not included)

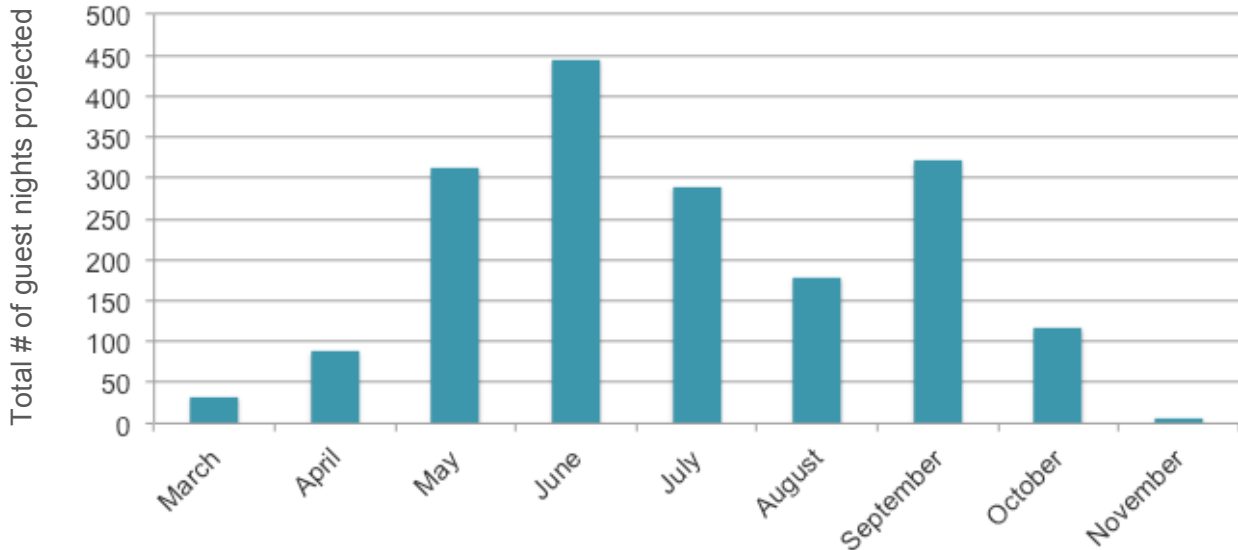
Answered: 48 Skipped: 52



Q21 Please project your monthly overnight use of The Mansfield Center, estimating a range of "guest nights" that you may seek to reserve for yourself, students, colleagues, and assistants. For example, if you expect to reserve 10 to 15 guest nights in a given month, write "10-15" in the corresponding box. Note: 1 guest staying for 1 night = 1 guest night, 2 guests staying for 1 night = 2 guest nights, etc.

Answered: 41 Skipped: 59

Answer Choices	Responses
March	21.95% 9
April	26.83% 11
May	53.66% 22
June	63.41% 26
July	53.66% 22
August	41.46% 17
September	58.54% 24
October	34.15% 14
November	19.51% 8



Q22 Please suggest others who may wish to learn about The Mount Mansfield Science and Stewardship Center.

Answered: 17 Skipped: 83

Answer Choices	Responses	
Name	100.00%	17
Affiliation	100.00%	17
Email address	100.00%	17

Q23 Comments and Suggestions

I'd like to see a month-long artist residency program at the Mount Mansfield Science and Stewardship Center, such as the residencies in place in National Parks. I also see the Center as an ideal location for Arts/Science summer camps and workshops for children and adults.

I realize the amounts above for maximum overnight fees are low, but my non-profit organization is unlikely to be able to afford higher amounts.

Would be interested in bringing small groups of birders to the Center to see montane species primarily and possibly visit banding stations.

It would be excellent to see a more established research facility on Mt Mansfield as it already has a good base of research information to build on. The challenge (as the Mount Washington Observatory knows all too well) is that a very site-specific research site/facility like this is challenged in the potential pool of grants it can seek. Diversifying its income sources will be essential for this effort to be more than a flash in the pan based on some seed sources of funding.

My use would be for Fall courses; probably sampling high altitude streams for macroinvertebrates. With collaboration, I'd be interested in covering other aspects of alpine ecology but it's not an area of personal expertise. I think a trade-off with another educator would be great; I'd cover aquatic macroinvertebrate ecology with their students; they'd cover something else with mine.

Use would depend on the opportunity to develop a field course through my University or the opportunities to conduct research at high elevation with graduate students

I notice that Dec-Feb aren't listed as options for the Center--those would be my peak times of interest.

Could use center to help with our on-going hydrologic data collection

I'd be interested in winter accommodations. Overall I think the center sounds like a neat idea!

I would love to see a network connection and the ability to set up and modify wireless sensor networks that communicate with a base station at the Center. This could be an invaluable piece of research infrastructure for a number of fields (meteorology, avian ecology, snow hydrology)

Long term monitoring is a great idea. I'm not sure how we'd be involved, but it's an interesting project and challenge.

This is a fantastic idea and I'm glad to see it growing logically from the alpine priorities planning effort that began a few years ago. I [conducted field studies] on Mount Mansfield about 10 years ago . . . and would likely return to Mansfield if such a facility were located there.

Would very much like to see this happen and would be happy to share past experiences teaching and hosting field camp there via UVM courses.

Funding is often a limiting factor.

Contact all other VT colleges/universities about this potential facility.

My answers are based on the assumption that I would develop a research project on the mountain.

The summit station would be a great place to showcase sustainability in terms of power, heating and waste disposal. Engineering interns could be engaged to help plan radiant heating from solar heat as well as PV panels for electricity. This could be a model of sustainability much like the Shoals Marine Laboratory has become in recent years. SML is on an island which is analogous to a mountaintop in so many ways. It would be a way to engage engineering students and reach a broader spectrum of students than environmental scientists while being a model of sustainability in keeping with UVM being the "environmental university". It's the right thing to do in the face of climate disruption. We can do this differently and smarter!

Summer courses on mountain stewardship would be a great way to engage and generate revenue.