Working with Faculty and the Administration to Build a Goldwater Nominee Pipeline.
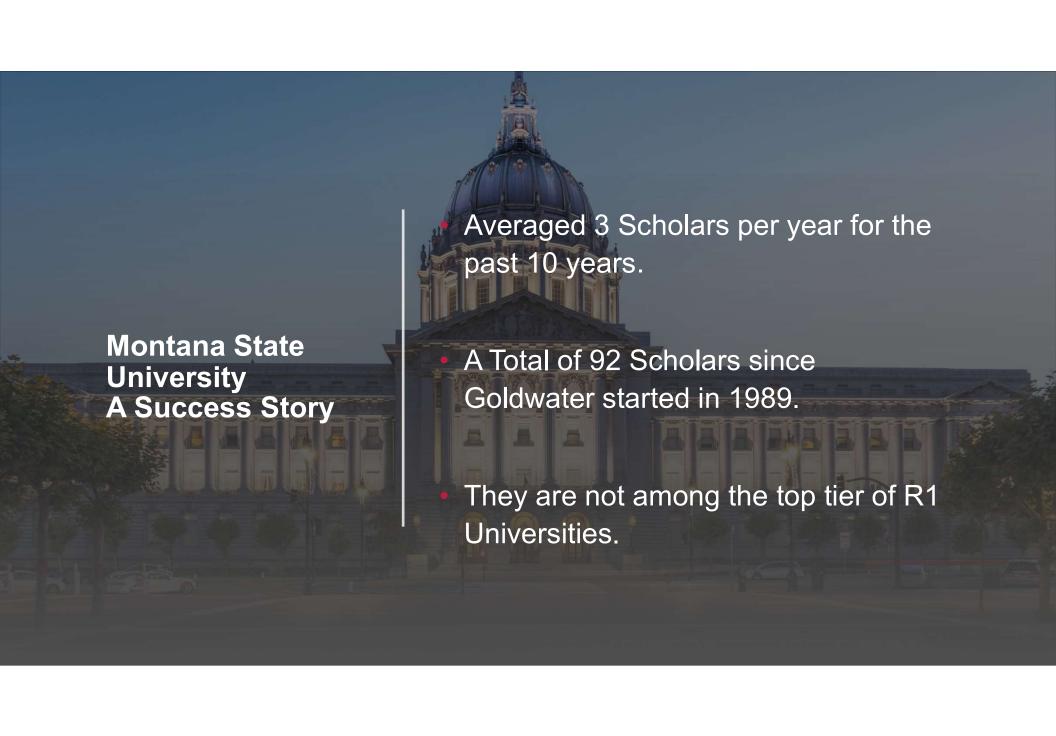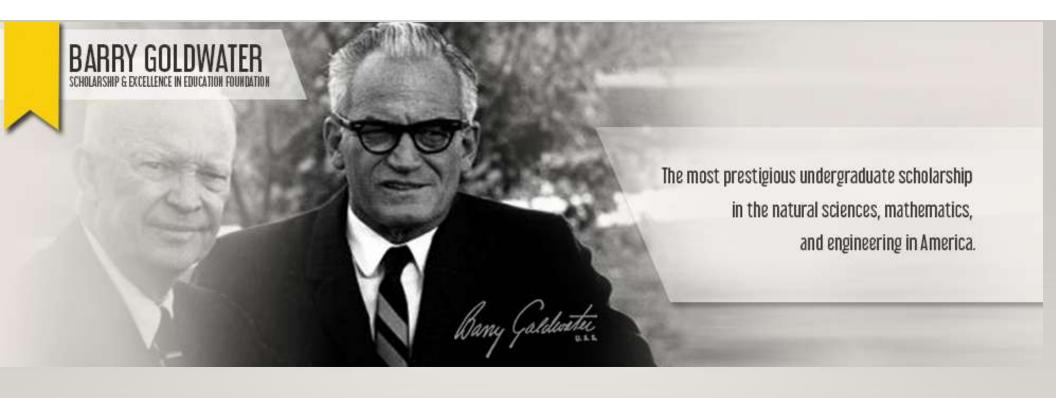
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Babs Wise and Bert Holmes

**Montana State University
A Success Story**

- Averaged 3 Scholars per year for the past 10 years.

- A Total of 92 Scholars since Goldwater started in 1989.

- They are not among the top tier of R1 Universities.

BARRY GOLDWATER
SCHOLARSHIP & EXCELLENCE IN EDUCATION FOUNDATION

The most prestigious undergraduate scholarship in the natural sciences, mathematics, and engineering in America.

Building a campus pipeline of successful Goldwater applicants requires STEM faculty and university administration working together.

Agenda

What does a pipeline look like?

What does it mean to make undergraduate research a campus priority?

How do you construct a pipeline?

Typical Evolution of the development of an Undergraduate Research Program.

Planning a pitch to the administration

Planning a pitch to faculty

How to use faculty...

Questions?

What Might a Pipeline look like?

- **First semester** students informed about research opportunities

- **Second semester** students dipping their toe in research… and hopefully applying to summer research opportunities

- **3rd semester** students engaged in research and perhaps applying to Goldwater

- **4th semester** students digging deeper into research questions, presenting their work, and lining up summer opportunities

- **5th semester** students fully engaged in presenting and continuing their research while applying to Goldwater

- **6th semester and beyond** – STEM students exchanging ideas across campus, and beginning to apply for graduate school and graduate fellowships: NSF, Hertz, Rhodes, and Marshall among others.

What Does it Take to Create a pipeline?

Undergraduate research (UGR) must be a campus-wide priority

What does that mean for the College?

- Strong administrative commitment and support
  - Establishment of an Undergraduate Research Office
  - Development Office actively supporting summer research programs
  - Celebration of effective research mentors
- STEM Departments engaged in nurturing research
  - Opportunities for summer/multi-week research opportunities for young students
  - Research mentors in all fields
  - Opportunities for presenting research

For the Goldwater Campus Rep ?

- Establish a broadly represented Goldwater Committee

- Recruit and nurture potential Goldwater Scholars early in their academic career

- Encourage and celebrate campus opportunities for presenting research

  - Poster presentations in public areas around campus: Library, Dean's office, Student Union, Admissions, at the Board of Trustees meeting…

  - Student research journals

- Publicize and celebrate success of STEM students.

How to construct a pipeline

- Convince the Administration the benefits of engaging STEM students in UGR early in the students' career.

  1. Increases retention in the major

  2. Has a larger impact on retention of women and UR students

  3. Helps clarify career intention in time for students to make adjustments (vs. UGR started as seniors)

If the pipeline is underway

- R1s, for example, have a collection of research active faculty—the challenge may be in convincing them to add undergraduates to their team.

- Many Undergraduate Institutions already have a robust UGR program, are you well connected to it? How can you make good use of their resources?

- Create opportunities for connections between Graduate and Undergraduate students.

How long?

A solid pipeline requires continuous nourishment from the Campus Rep, there are several milestones to watch for:

- Having word of mouth among students usually takes a minimum of four years,

- Commitment from the administration can be quick, but must be renewed every time a new Dean is appointed!

- Faculty word of mouth usually takes a couple of successful students over a few years

Typical Evolution of Undergraduate Research Pipeline

1. The Institution identifies UGR as a priority (with strong Administrative support).
2. Someone is identified to spearhead the UGR initiative.
3. Faculty committed to UGR are identified/secured.
4. An UGR presentation day/afternoon is established, typically mid-week in the Spring semester.
5. The Institution establishes a Journal of UGR published on the campus (not always accomplished).
6. The Development Office makes fund-raising for summer research stipends and/or travel for students to present their results a priority. Typically, first for students, then later for the others (PI, supplies, and travel).
7. Departments/Colleges realize that their "cookbook" laboratory/lecture curriculum should be replaced by a "research-rich" curriculum. This is often the hardest to accomplish.

Planning a pitch to the administration

Where does research fit in the university's strategic plan?

Who is a STEM professor serving in the Administration?

Which great alumni were STEM students?

What comparable college is more successful getting Goldwaters or graduate fellowships? How do they support research? `

Planning a faculty pitch

- An effective research team structure in a "Laddered" team involving freshmen, sophomores, juniors, and seniors. The expectation is that junior and seniors are in their 2nd or 3rd summer/year of engaging in research. This reduces the need for faculty to provide direct mentoring on all topics, as students can handle them. Peer-to-peer learning as well as graduate student mentorship, where available, is very powerful. In addition, the Laddered approach greatly enhances the successes leading to presentation, publication and external funding.

- Focus on benefits of research successes leading to presentations and publications. These also can lead to external funding of RUI or REU NSF awards. All of which are key to academic tenure and promotion.

- Point out that undergraduates can be a relatively low-cost avenue to have more researchers and can lead to more administrative support.

How to use faculty

- Create a Campus Goldwater Committee see presentation for Sept 24, 2025

- Recruit and nurture students

- Help identify other Research Mentors and programs for students

- Encourage the formation of science clubs and undergraduate journals (a great place to recruit Goldwater applications)

- Promote research activities on campus with younger students

- Publicize to other faculty

Gratitude to the administration and to faculty goes a long way!

- Thank them – any swag you can give them?

- Can you write a letter to their Dean?

- Feed them– meetings with food/drink always more fun

- Shout their names and contributions from the rooftop

- Can you create a faculty mentor award for STEM departments?

- Can you sponsor a recognition event for undergraduates and their mentors with speakers from the administration?

- Remind students to list mentors on their applications for recognition by Goldwater.

Further points for the campus

- Good Press is good for all and can lead to donor support

- Scholarship numbers are in US News and Forbes data

- Early wins can lead to graduate fellowships—Marshall/Rhodes, Churchill, NSF, Hertz…

- Helps secure graduate school admissions

COMMENTS AND QUESTIONS?

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