LOGIC MODEL

- A visual depiction of what a project does and what changes it is expected to bring about.

Learn more:

- – Readings, template, examples: www.uwex.edu/ces/pdande/evaluation/evallogicmodel.html
- – Webinar, templates, examples: http://www.evalu-ate.org/webinars/2016-aug/

LOGIC MODEL

EvaluATE

What new and existing resources will be used to support the project?

What are the main things the project will do?

What products will be created? (typically, things that can be directly observed and that will continue to exist after the project ends)

What will occur as a direct result of the activities and outputs? (typically, changes in knowledge, skills, attitudes)

What results should follow from the initial outcomes? (typically, changes in behavior, policies, practice)

What results should follow from the initial outcomes? (typically, changes in broader conditions)

Inputs	Activities	Outputs	Short-Term Outcomes	Mid-Term Outcomes	Long-Term Outcomes

Inputs
- NSF funding
- Faculty
- Advisory panel
- Industry partners
- In-kind contributions

Activities
- Establish regional partnerships
- Develop curriculum
- Conduct workshops
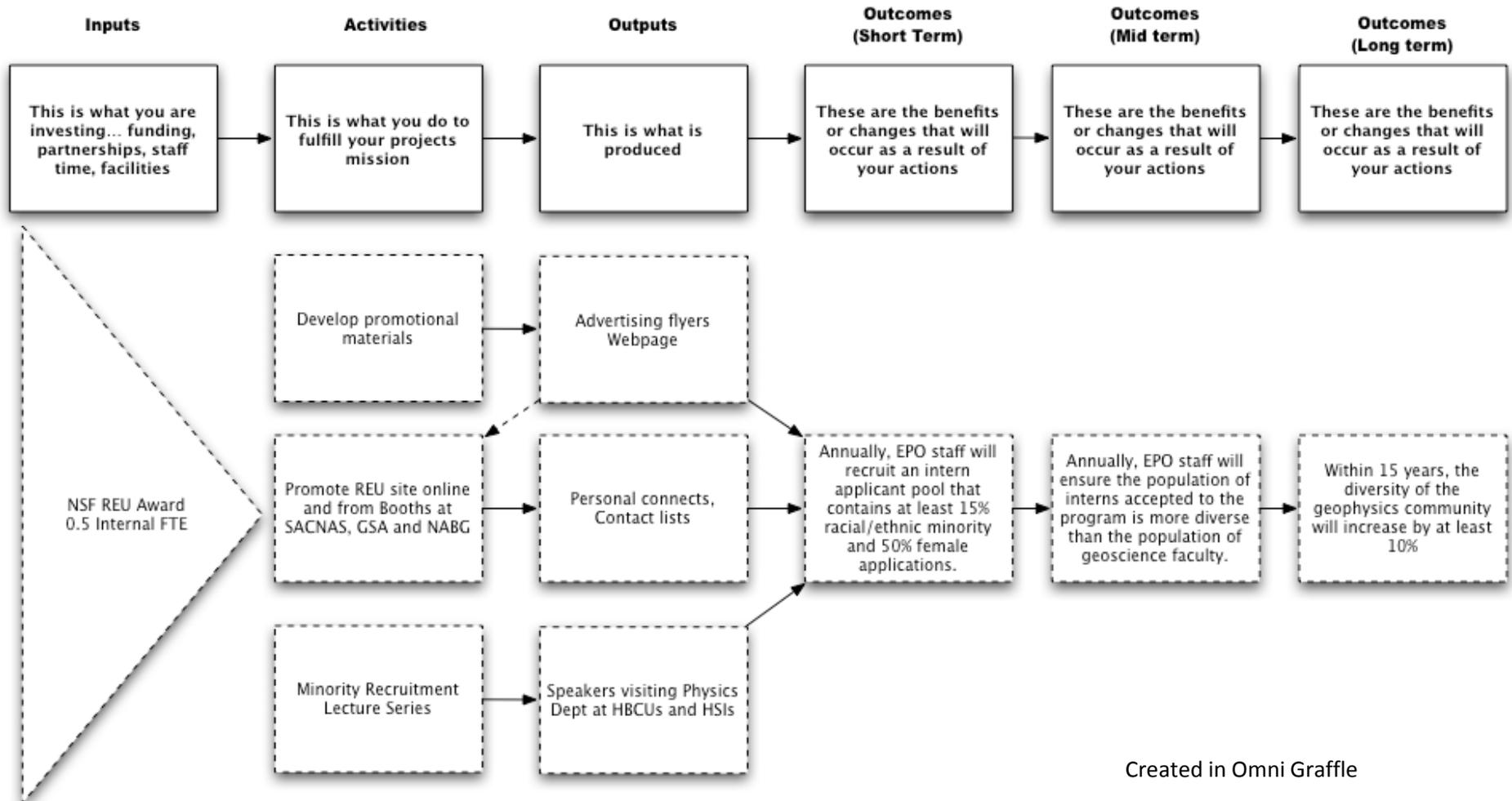- Provide research/ field experiences
- Establish articulation agreement

Outputs
- Curriculum materials developed
- Policies created
- Publications issued
- New certifications
- Tools/resources

Short-Term Outcomes
- Faculty learn to use instructional technology
- Students gain technical skills
- Students' interest in technical careers increases

Mid-Term Outcomes
- Students persist in their programs
- Faculty improve instruction
- Colleges adopt and implement project-developed curriculum

Long-Term Outcomes
- Increased regional economic vitality
- Increased diversity in the technical workforce
- A more highly skilled and adaptable workforce

LOGIC MODEL - Example

Inputs	Activities	Outputs	Outcomes (Short Term)	Outcomes (Mid term)	Outcomes (Long term)
This is what you are investing... funding, partnerships, staff time, facilities	This is what you do to fulfill your projects mission	This is what is produced	These are the benefits or changes that will occur as a result of your actions	These are the benefits or changes that will occur as a result of your actions	These are the benefits or changes that will occur as a result of your actions

NSF REU Award 0.5 Internal FTE

Develop promotional materials → Advertising flyers Webpage

Promote REU site online and from Booths at SACNAS, GSA and NABG → Personal connects, Contact lists

Minority Recruitment Lecture Series → Speakers visiting Physics Dept at HBCUs and HSIs

Annually, EPO staff will recruit an intern applicant pool that contains at least 15% racial/ethnic minority and 50% female applications.

Annually, EPO staff will ensure the population of interns accepted to the program is more diverse than the population of geoscience faculty.

Within 15 years, the diversity of the geophysics community will increase by at least 10%

Created in Omni Graffle

LOGIC MODEL Template

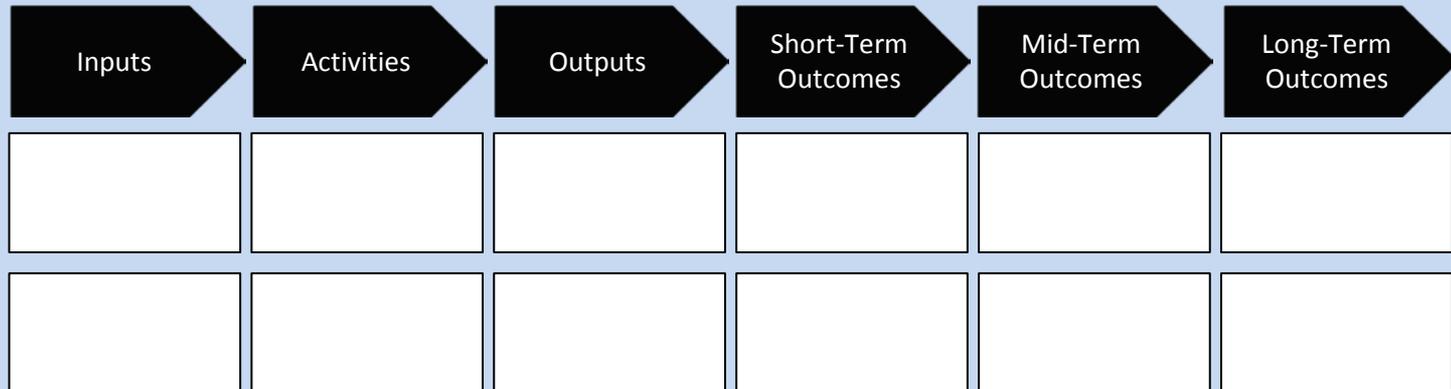| Inputs	Activities	Outputs	Short-Term Outcomes	Mid-Term Outcomes	Long-Term Outcomes
What new and existing resources will be used to support the project?	What are the main things the project will do?	What products will be created? (typically, things that can be directly observed and that will continue to exist after the project ends)	What will occur as a direct result of the activities and outputs? (typically, changes in knowledge, skills, attitudes)	What results should follow from the initial outcomes? (typically, changes in behavior, policies, practice)	What results should follow from the initial outcomes? (typically, changes in broader conditions)

Below are examples the *types* of information that might appear under each header of the logic model. When developing a project logic model, be as specific as possible in articulating the components of the model. For example, a project-specific short-term outcome might be phrased as "learners will be able to install, maintain, and troubleshoot high-vacuum systems."

Inputs	Activities	Outputs	Short-Term Outcomes	Mid-Term Outcomes	Long-Term Outcomes
• NSF funding • Faculty • Advisory panel • Industry partners • In-kind contributions	• Establish regional partnerships • Develop curriculum • Conduct workshops • Provide research/ field experiences • Establish articulation agreement	• Curriculum materials developed • Policies created • Publications issued • New certifications • Tools/resources	• Faculty learn to use instructional technology • Students gain technical skills • Students' interest in technical careers increases	• Students persist in their programs • Faculty improve instruction • Colleges adopt and implement project-developed curriculum	• Increased regional economic vitality • Increased diversity in the technical workforce • A more highly skilled and adaptable workforce

http://www.evalu-ate.org

SMART OUTCOMES

- **S**pecific: Be precise about what you are going to achieve (who, what, etc)

- **M**easurable: Quantify the objectives with a focus on "how much"

- **A**chievable: Should be attainable within a given time frame and available resources

- **R**ealistic: Align with the needs of the target audience

- **T**ime-Specific: State when you will achieve the objective

SMART OUTCOMES

What you will do	→	?
With whom	Process →	?
When	→	?
What you expect	Impact →	?

SMART OUTCOMES

What you will do ➡️ *Use online tools (e.g. webinars, SLACK, Facebook, and blogs) to deliver content an facilitate connections*

With whom ➡️ **Process** ➡️ *IRIS Interns*

When ➡️ *Annually*

What you expect ➡️ **Impact** ➡️ at least 80% of interns will agree or demonstrate they were connected to the other interns in a beneficial way

Annually, 80% of interns will agree or demonstrate they were connected to the other interns in a beneficial way through the use of IRIS cyber-infrastructure.

http://dhhs.ne.gov/publichealth/Pages/minorityhealth_smartedit.aspx

University of Colorado Boulder

Title of research study: *[insert title of research study here with protocol number, if applicable]*

Investigator: *[insert name of principal investigator]*

Why am I being invited to take part in a research study?

We invite you to take part in a research study because _____. *[Fill in the circumstance or condition that makes subjects eligible for the research.]*

What should I know about a research study?

- Someone will explain this research study to you.
- Whether or not you take part is up to you.
- You can choose not to take part.
- You can agree to take part and later change your mind.
- Your decision will not be held against you.
- You can ask all the questions you want before you decide.

Who can I talk to?

If you have questions, concerns, or complaints, or think the research has hurt you, talk to the research team at *[Insert contact information for the research team]*

This research has been reviewed and approved by an Institutional Review Board ("IRB"). You may talk to them at (303) 735-3702 or irbadmin@colorado.edu if:

- Your questions, concerns, or complaints are not being answered by the research team.
- You cannot reach the research team.
- You want to talk to someone besides the research team.
- You have questions about your rights as a research subject.

FORMATIVE vs. SUMMATIVE

- Formative assessments provide students and the program with feedback prior to and during the instruction/intervention

- Summative assessments occur at the conclusion of a program and measure the accomplishments of the program, generally tied to the program's objectives/outcomes

Frontend Examples

- Interviews
- Grit / perceived confidence / Self-Efficacy
- Communication skills
- Pre/post skill surveys
  - Graph reading
  - Paper reading
  - Nature of Science / Science Literacy
  - Process of Science

Midway Examples

- Surveys

- Weekly logs / Blogs

- White board talks

- Mentor reflection or mentor/mentee discussion

End of Program Examples

- Interviews
- Reflection surveys
- URSSA
- Longitudinal surveys/tracking

Links

- URSSA:
  http://www.colorado.edu/eer/research/undergradtools.html

- http://scied.ucar.edu/soars/reu/running-an-reu/program-evaluation

- http://serc.carleton.edu/NAGTWorkshops/undergraduate_research/reu_assessments.html

Two Types of Objectives

- Process objectives
- Impact objectives

PROCESS OBJECTIVES

- Describes specific numbers/types of activities to be completed by specific dates

IMPACT OBJECTIVES

- The intended and unintended effects on the <u>b</u>ehavior, <u>a</u>ttitude, <u>s</u>kills, <u>i</u>nterest, and <u>k</u>nowledge (BASIK) of the participants
  - <u>Behavior:</u> Evidence of behavior change includes participants' self-reported intentions to change their behavior and data from longitudinal follow-ups showing whether such behavior change has occurred.
  - <u>Attitudes:</u> Impacts in this category encompass changes in long-term perspectives toward a STEM topic, a group of people, species or ecosystem, activities, theories, or careers.
  - <u>Skills:</u> Either entirely new ones or the reinforcement or practice of developing skills that tend to be procedural aspects of knowing, as opposed to the more declarative aspects of knowledge impacts.
  - <u>Interest:</u> Engagement and/or interest in a particular scientific topic, concept, phenomena, theory, or career central to the project. Impacts in this category capture the excitement and involvement of participants in a topic, area, or aspect of STEM.
  - <u>Knowledge:</u> Awareness, knowledge, and/or understanding of a particular scientific topic, concept, phenomena, theory, or career central to the project that can be stated by participants in their own words and/or actions, whether that is during, immediately after, or long after, the experience.