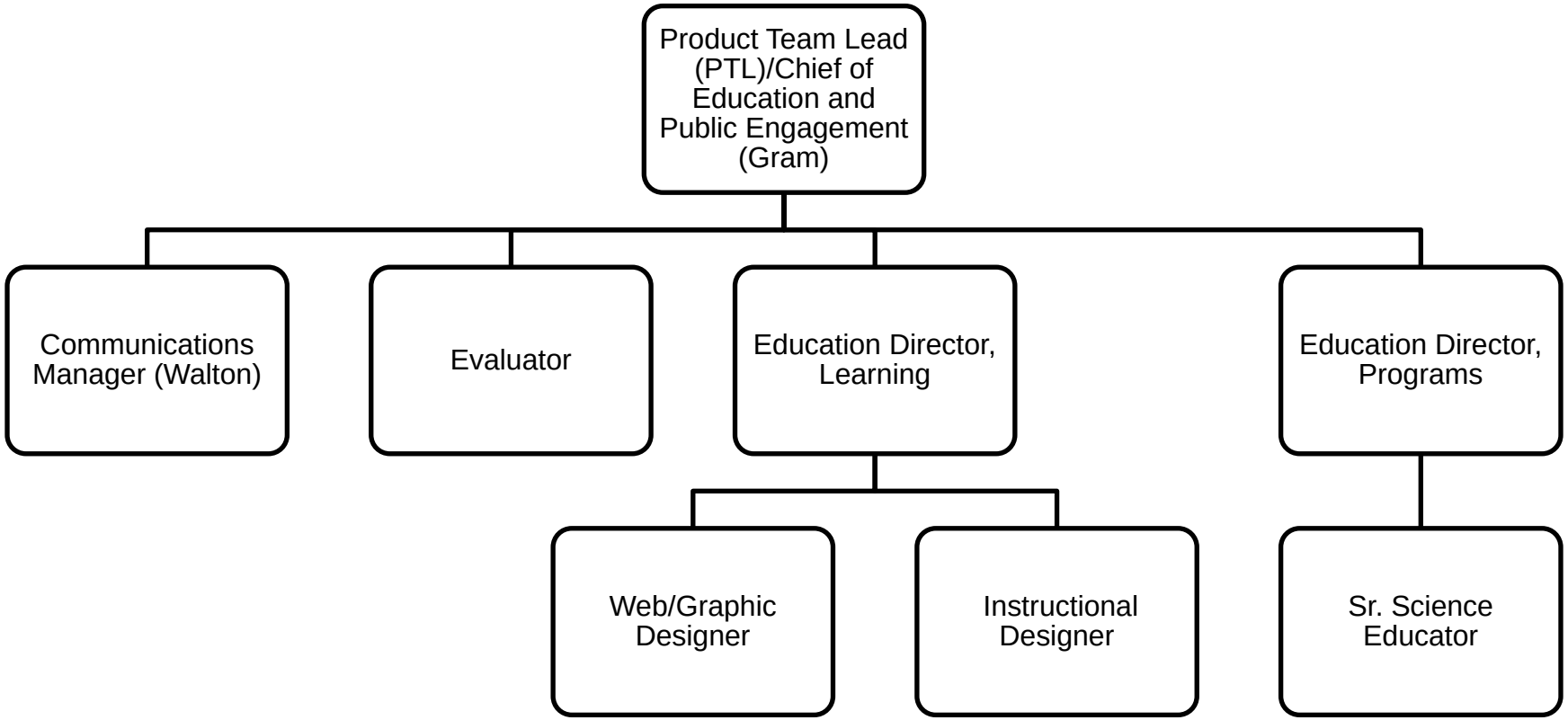
National Ecological Observatory Network

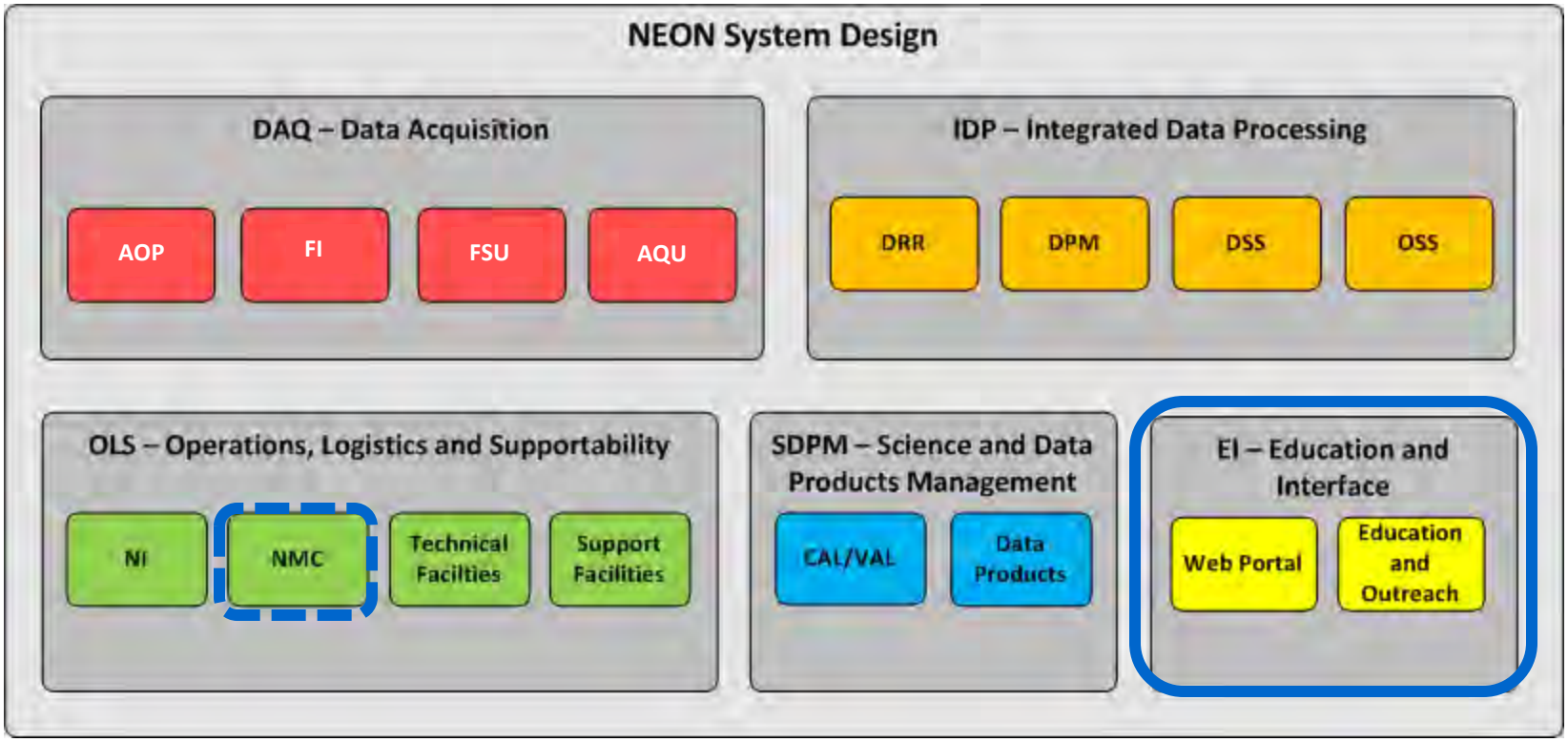
Education and Public Engagement

W. Gram/NEON Project Team

EDU Construction Staffing



Education and Public Engagement



EDU Mission and Goals

Enable society and the scientific community to **use** ecological information and forecasts to understand and effectively address critical ecological questions and issues.

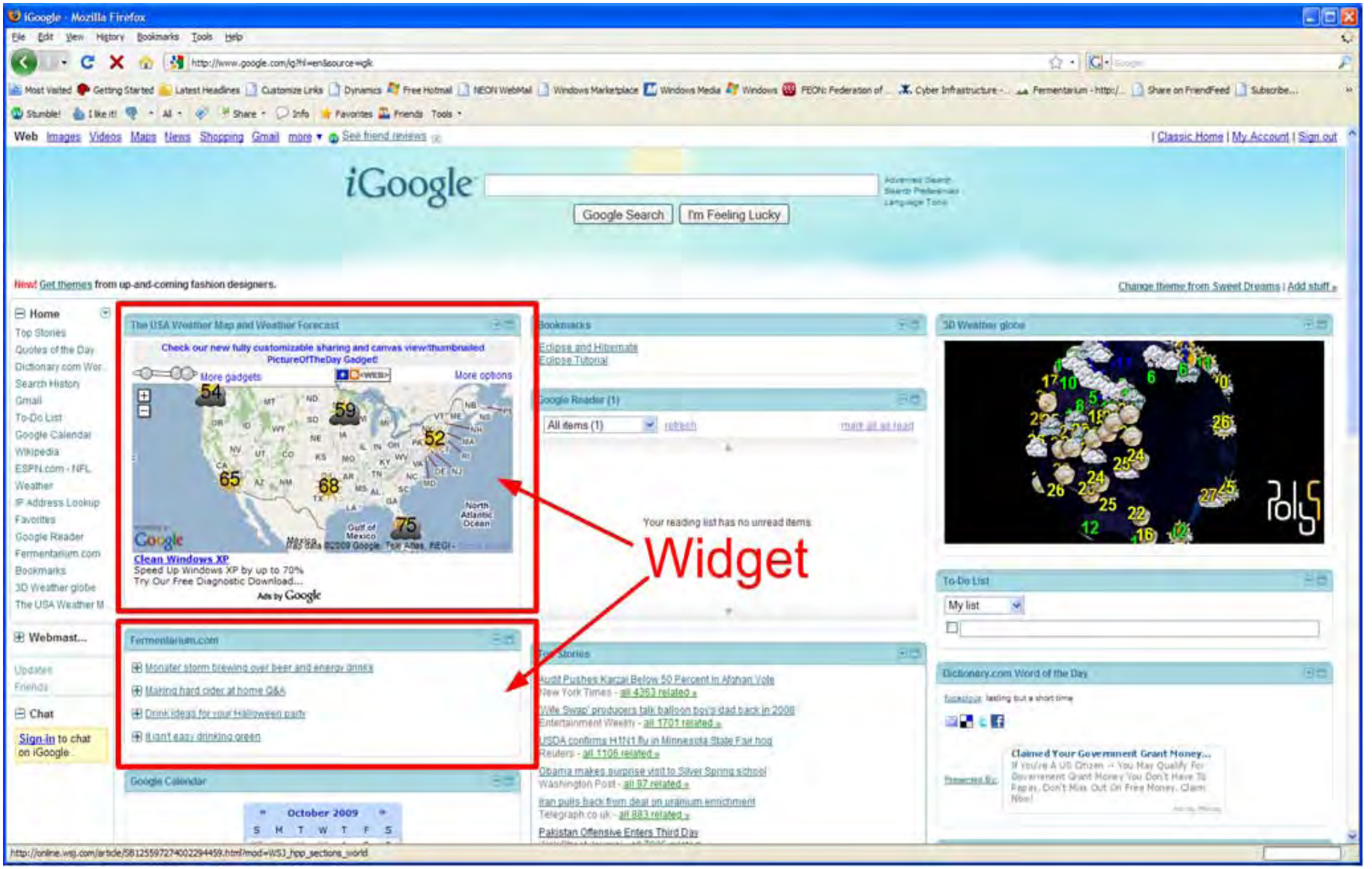
Goals

- Promote and facilitate public understanding of ecological science (i.e., *ecological literacy*)
- Educate next generation of ecological scientists
- Enhance diversity of ecological research and education communities
- Provide tools for students, educators and decision makers to use NEON data to make informed decisions about ecological issues

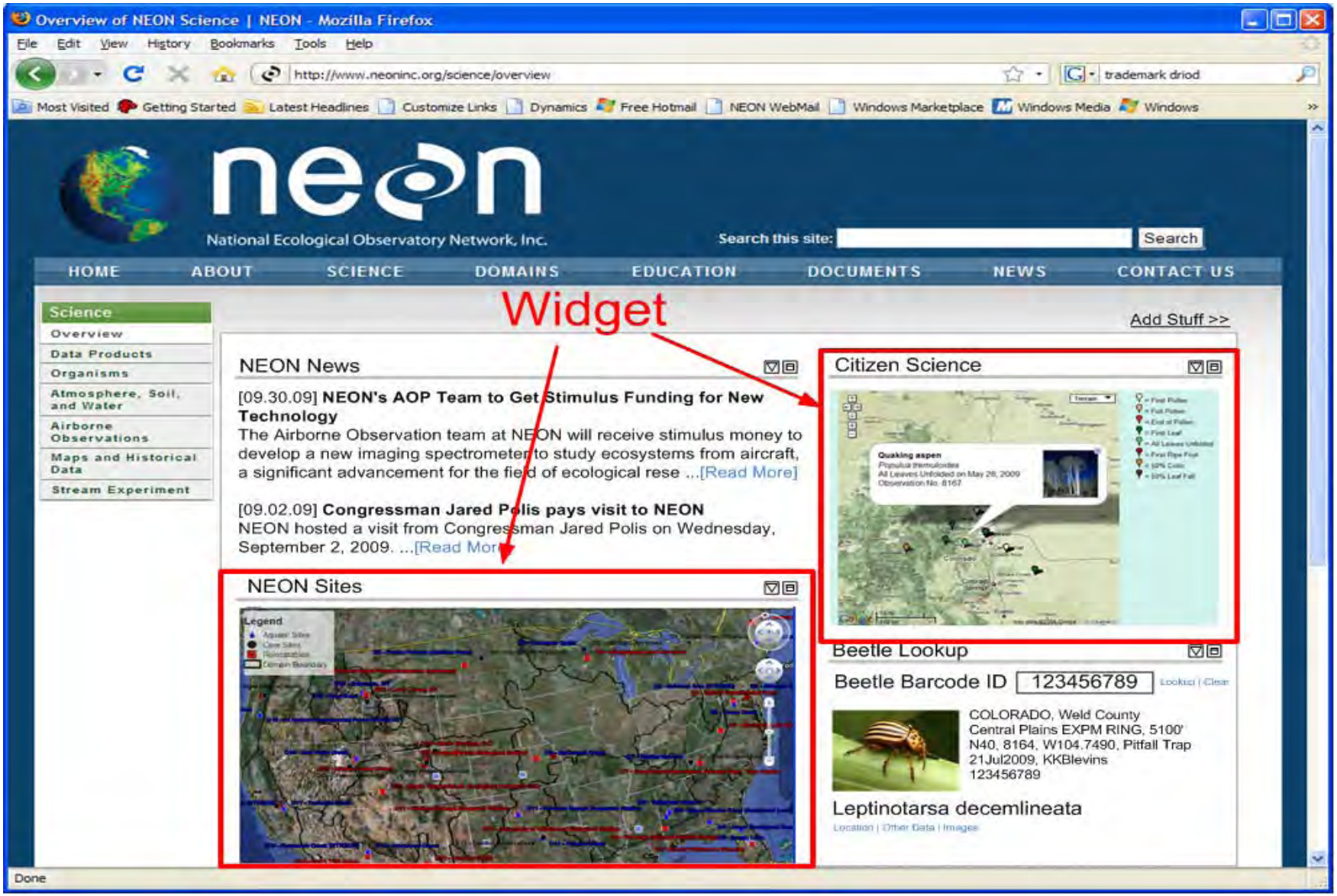
NEON Web Portal and Tools

- Citizen science area
  - Enable citizen scientists to collect, contribute, interpret, and visualize scientific data
- General area
  - Introduce users to NEON
- Decision-support area
  - Provides tools and resources for decision makers to use NEON data
- Educator web area
  - Provides resources for educators to master content and engage students in ecological learning experiences using NEON data
- Data products area
  - Access to NEON data products

iGoogle Portal Example



NEON Web Portal Prototype



User Functionality

- Users can create their own profiles and add their own content from available widgets
- Each widget represents content or tools targeted towards a specific type of user
- Citizen Science, Educator, and Decision-support areas of the web portal will consist of a predetermined set of widgets and associated content
- Users can add or remove widgets from any education area to create their own unique area, or “view”
- Widget approach allows NEON to extend the education areas in the future
- Users can discuss results with other users in the user community

NEON Learning Experiences

- Citizen science projects
  - Educate/train citizen scientists and expand data collection capacity
- Professional development opportunities
  - Prepare educators to use and contribute to NEON data/resources
- Research and internship opportunities for undergraduates
  - Prepare future STEM professionals and broaden participation
- Competitive field and analysis course for graduate students
  - Prepare the next generation of scientists to use NEON data and tools
- NEON museum projects
  - Increase public awareness of continental-scale ecology
- Postdoctoral research opportunities
  - Prepare scientists to participate in large facility initiatives
- Workshops, seminars and courses
  - Prepare individuals to more effectively use and contribute to NEON data

Citizen Science Projects

- Increase awareness and educate citizen scientists about the impacts of climate change, land-use change, and invasive species on continental-scale ecological processes
- Enable citizen scientists to collect, contribute, interpret and visualize scientific data
- Expand NEON data collection capacity by enabling laypersons to collect geographically distributed data

Mobile phone technology and citizen science

UCLA Center for Embedded Network Sensing is developing software for mobile-to-web portal system using Project BudBurst database

Features

- mobile phones used to capture and upload data in the field
- data automatically geotagged
- photo uploads will help with quality control of data being reported
- real time feedback
- Web 2.0 social networking

CENS
CENTER FOR EMBEDDED NETWORKED SENSING

Project BudBurst
www.budburst.org

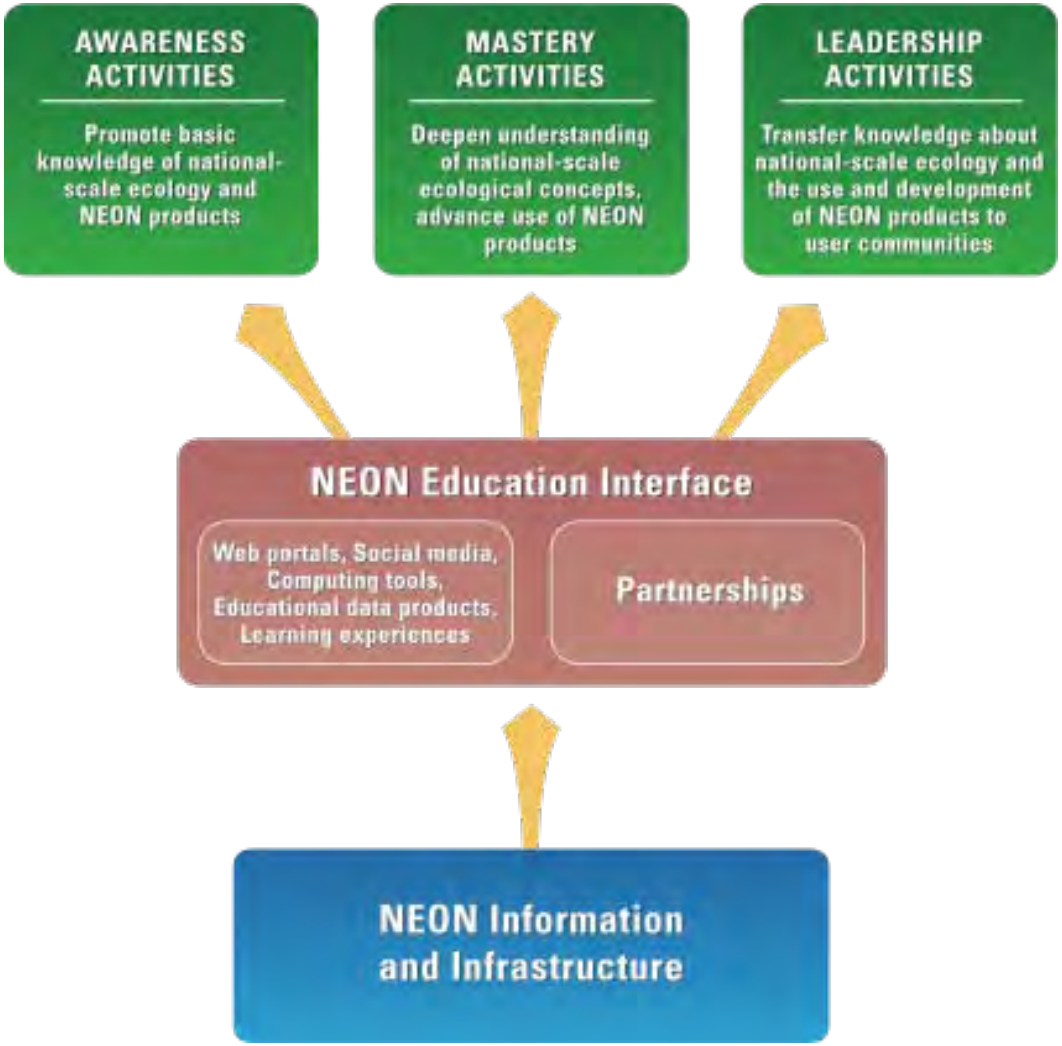
Workshops, Seminars and Courses

Provide training and learning experiences for individuals to more effectively use and contribute to NEON data, tools and programs

Conceptual Framework

- Ensure NEON science, including data, is **accessible** to and **usable** by a diversity of communities
- Maximize impact by **facilitating partnerships** – NEON acts as a broker to provide resources for stakeholders to use as they deem appropriate
- Promote science education model that emphasizes the process of science (collecting, analyzing, & interpreting data) through **active learning**, or "doing science"
- Reflect societal trends for learning through an increasingly **decentralized** process and **free-choice learning** context
- Serve as a **catalyst** to advance "science as a way of knowing"
- Serve as a model for **transforming science to include citizens**

Conceptual Framework



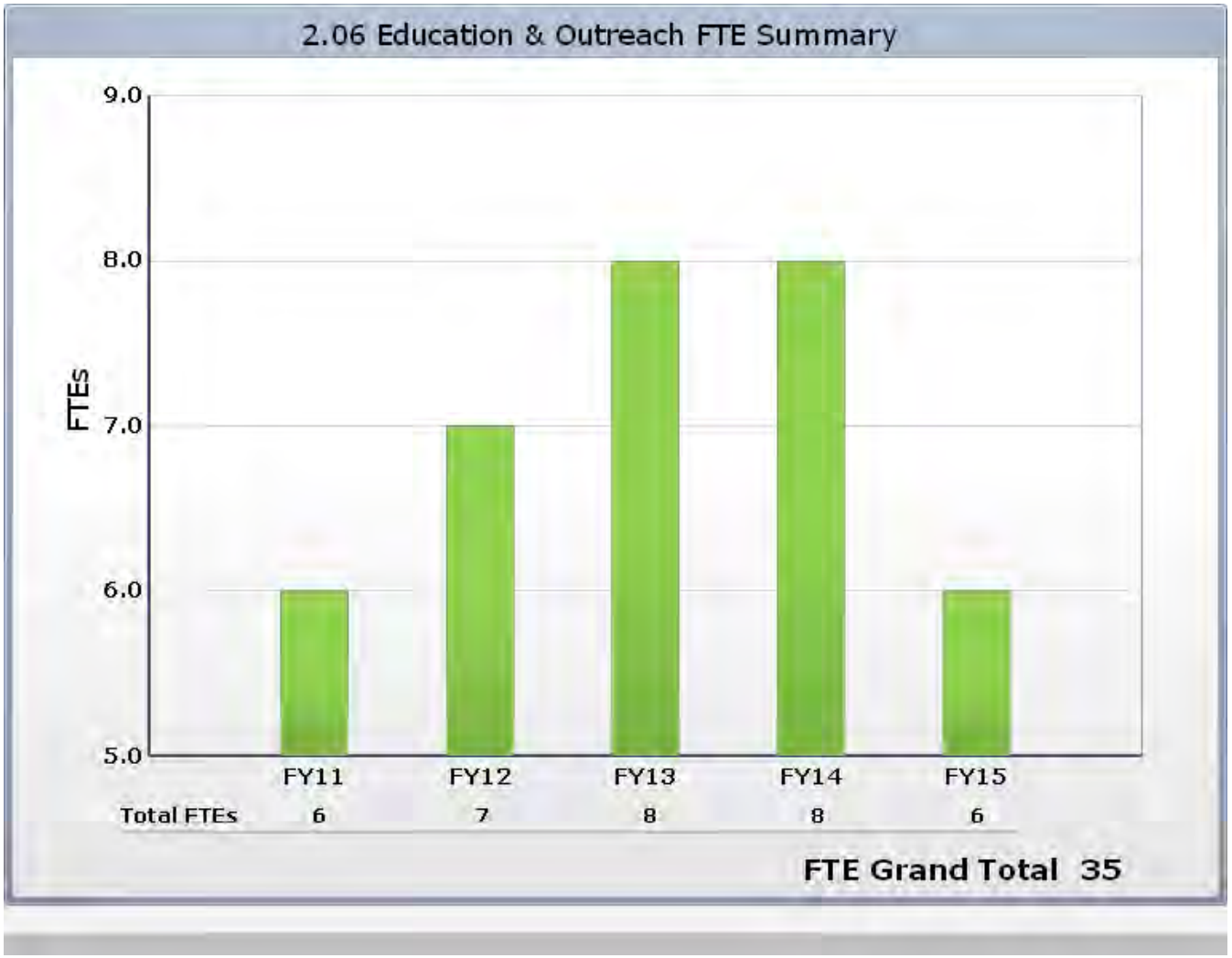
EDU Products within Conceptual Framework

	Awareness	Mastery	Leadership
Citizen science	X	X	X
General area web portal	X		
Decision-support area web portal		X	X
Educator area web portal		X	X
Professional development		X	X
Undergraduate research	X	X	
Undergraduate internships	X	X	
Graduate course		X	X
Museum projects	X		
Postdoctoral research		X	X
Workshops, seminars, courses		X	X

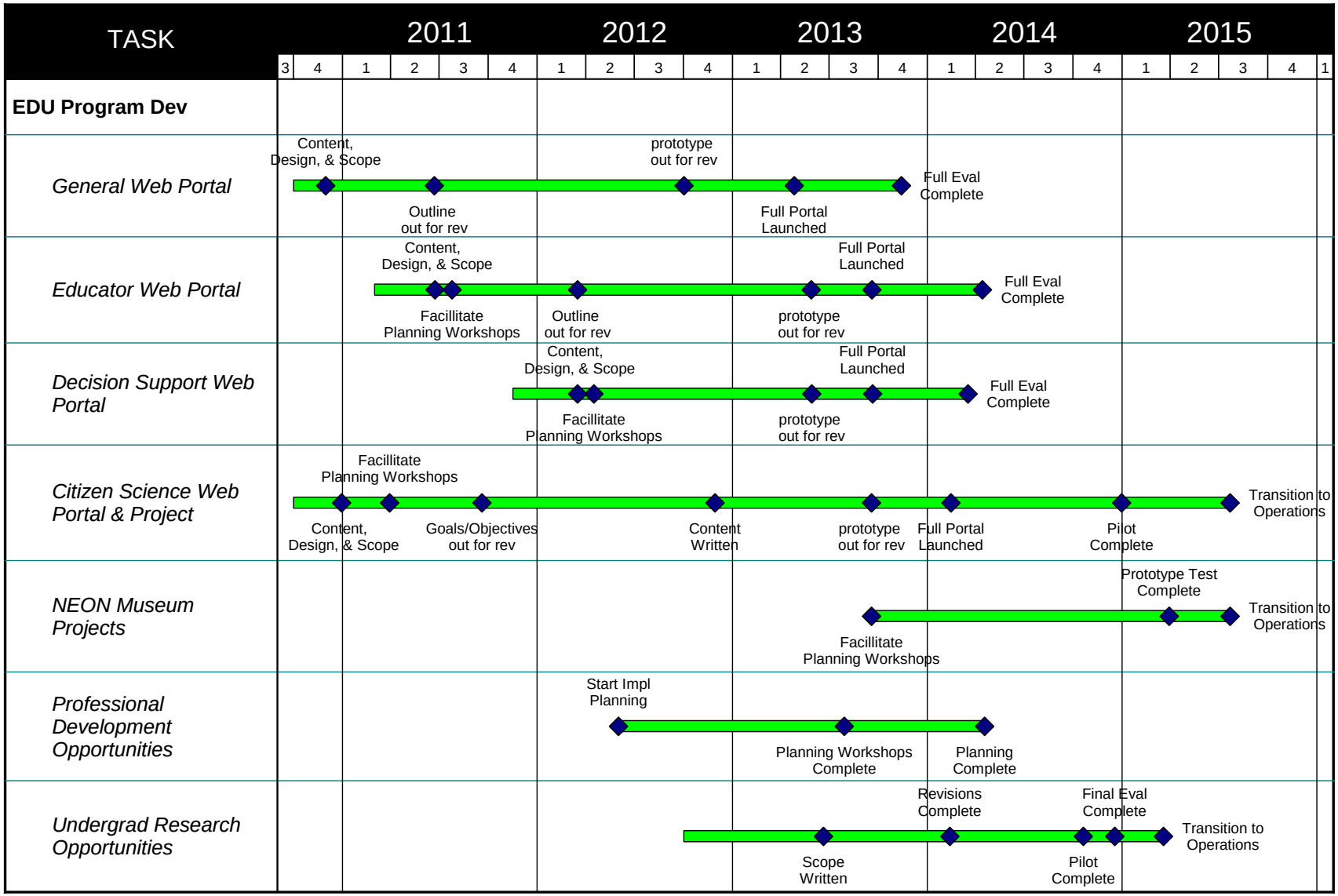
2.06 Education & Outreach - WBS

WBS	Title
2.06	Education & Outreach
2.06.10	Education & Outreach Management
2.06.20	Eduation Program Deployment
2.06.20.01	ED General Area of Web Portal
2.06.20.02	Educator Area of Web Portal
2.06.20.03	Decision-Support Area of Web Portal
2.06.20.04	Citizen Science Projects and Area of the Web Portal
2.06.20.05	NEON Museum Projects
2.06.20.06	Professional Development Opportunities
2.06.20.07	Research Opportunities for Undergraduates
2.06.20.08	Internship Opportunities for Undergraduates
2.06.20.09	Competitive Field and Analysis Course for Graduate Students
2.06.20.10	Workshops, Seminars, and Courses
2.06.30	Ed Equipment

2.06 Education & Outreach FTE Spread by FY



2.06 Education & Outreach (EDU)
Construction Phase Schedule



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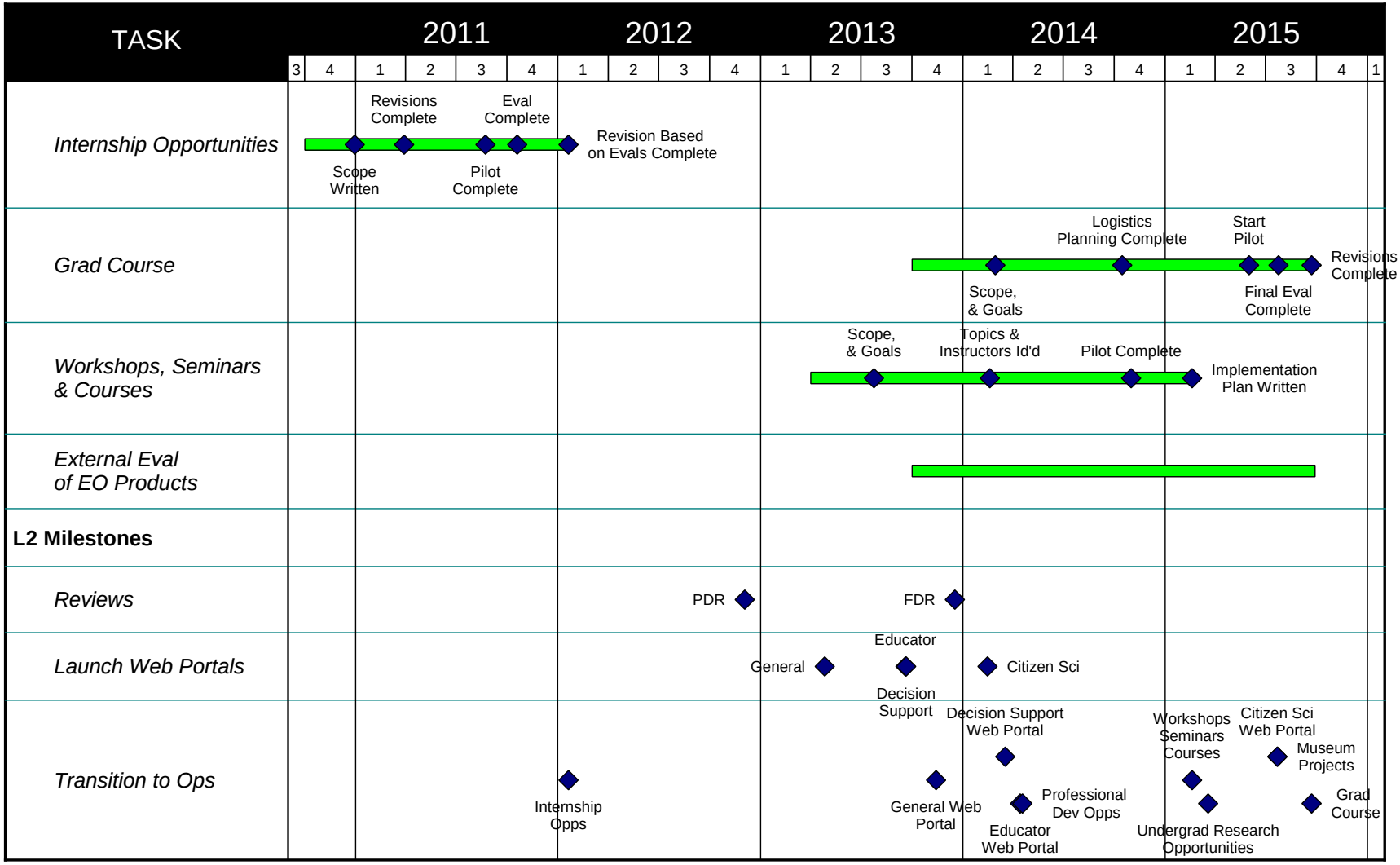

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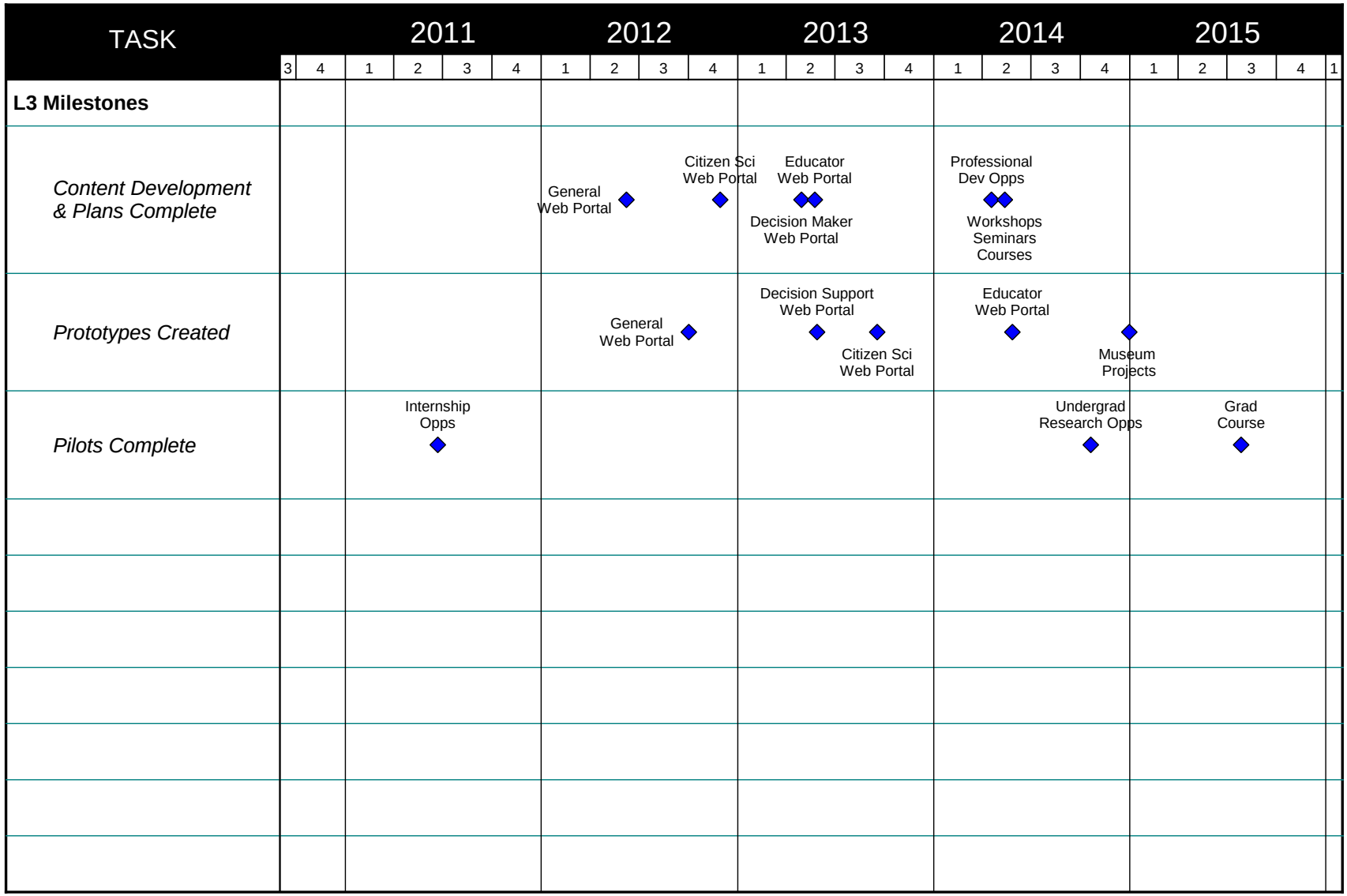

EDU PT Risk Register

Risk ID	Risk Title	Description	RRS	Risk Exposure	Occurrence Cost	Program Area	Status
81	Target decision-support audience is not defined	Requirements for decision-support area of NEON web portal should be defined to meet users' needs but the target users have not been defined specifically enough to accurately complete this process.	1.5	Medium	$ 333,500	EDU	Mitigate
163	Web portal areas do not meet needs of target users	Completed web portal areas do not meet needs of target users because they (1) are not easily usable by target audiences, (2) do not have content that is appropriate for target audiences, (3) are not working as they are suppose to work (i.e., technical problems with functionality), and/or (4) do not have the functionality that users need to be a highly valued resource. Occurrence cost=half of total EDU cost to develop and build 3 web portal areas; mitigation cost = cost of prototyping and evaluating prototypes.	1.5	Medium	$ 800,000	EDU	Mitigate
165	Citizen Science project and web portal do not meet target audiences' needs and/or activity goals	Citizen Science project and web portal do meet user needs and/or activity goals because (1) content is not attractive to target audiences, (2) resources are not easily usable by target audiences, (3) activities do not offer innovative opportunities for users that are unique, (4) data cannot easily be integrated with other NEON data, and/or (5) resources are not reaching target audiences. Occurrence cost = total cost to develop Citizen Science project; Mitigation cost = cost to prototype project for one season.	1.5	Medium	$ 800,000	EDU	Mitigate
77	NEON fails to identify and/or engage critical educational partners	NEON does not identify the right partners to participate in educational activity development and implementation and/or partners don't have capacity to contribute to activity development without additional funds.	1.2	Medium	$ 400,000	EDU	Monitor
164	Educational programs do not meet target audiences' needs	Educational programs/learning experiences do not meet the needs of target audiences because (1) content is not appropriate for audience, (2) content delivery is not appropriate for/does not engage target audience, (3) program does not meet expectations of participants, (4) program does not meet program goals and objectives. Occurrence costs = total cost to develop programs; mitigation cost = cost to pilot programs.	0.9	Medium	$ 500,000	EDU	Mitigate
83	Inability to recruit qualified Graduate Course Faculty Leaders	Difficulty recruiting qualified scientists to develop graduate course. Occurrence cost = cost to hire additional people to develop course.	0.5	Low	$ 70,000	EDU	Monitor
82	Inability to recruit educators with appropriate expertise to develop learning modules for educator web portal	Difficulty recruiting highly qualified educators to develop appropriate learning modules for educator web portal to serve learners with a variety of skills. Occurrence cost = cost to hire curriculum developers to create learning modules.	0.4	Low	$ 100,000	EDU	Monitor
84	Inability to hire external evaluation firms or evaluators to conduct assessment activities	Difficulty obtaining appropriate contracts to complete timely external evaluation of educational products with available funds. Occurrence cost = cost to recruit and hire individual evaluators to complete evaluation components.	0.3	Low	$ 100,000	EDU	Monitor

EDU Operations

Responsibilities

- Provide tools for a diversity of users with different skills and interests, including educators, students, decision makers and the general public, to access NEON data products
- Maintain, revise and create new educational resources to meet needs of diverse users
- Facilitate use of NEON data products and educational resources
- Facilitate training the next generation of continental-scale ecologists and environmental scientists
- Plan and implement the NEON public relations strategy
- Build and support partnerships with communities and organizations to enable partners to implement NEON-based activities for their constituencies

Staffing

- Construction staffing + 6 FTE Educators

PDR Issues and Progress

- Baseline, prototype and evaluate Citizen Science as quickly as possible
  - Requested funds for baseline CS study, web portal development, prototyping and evaluation in NEON bridge proposal
- Prototype workshops for scientists
  - 4 prototype workshops are included in construction activities.
- Produce analysis of distribution of resources against EDU requirements and conceptual framework
  - Explained during detailed presentation
- Clarify staffing transition from Construction to Operations
  - Transition explained in EDU Management Plan and detailed presentation
- Risks involved in building partnerships
  - Risk added to the Risk Radar
- Cost estimate for external evaluation seems low
  - Vendor quotes obtained for this evaluation and included in EDU budget
- Public Relations title not allowed in construction budget
  - Changed to Communications Manager to better define construction tasks

PDR Issues and Progress

- Using 4% contingency on salaries to mitigate risk on developing educational products is inadequate
  - Specific risks and mitigation plans for educational products added to Risk Radar, including prototypes
- Visible collaboration among NEON education, science, computing and engineering
  - Included throughout NEON documentation
- Cost analysis of in-house versus out-of-house development of web portal
  - CI and EDU budgets include funds for both in-house and out-of-house tasks related to development of web portal
- Decision-support audience may be difficult to define
  - Defining decision-support audience added to Risk Radar and will be mitigated prior to developing decision-support area of web portal
- No outcome metrics defined for EDU
  - Set of outcome metrics have been defined for EDU

Work Over Next 12 Months

- Baseline assessment of Citizen Science projects
- Prototype NEON Citizen Science opportunities
- Build partnerships with complementary organizations, agencies, professional societies, and groups
- Communicate with NEON stakeholders through meetings, professional conferences, web site, social media, outreach presentations, electronic updates, and media outreach

Summary

- NEON science, including data, must be **accessible** to and **usable** by a diversity of communities
- EDU will be an **interface** between NEON science/data and user communities
- EDU will maximize impact by **facilitating partnerships**
- EDU will develop the **NEON web portal** in collaboration with CI and develop 8 **learning experiences** for different audiences
- Early activities will focus on **Citizen Science** baseline assessment and prototype
- **Assessment** is integrated into EDU product development and implementation
- EDU represents approximately **2%** of the overall NEON construction budget

The National Ecological Observatory Network is a project sponsored by the National Science Foundation and managed under cooperative agreement by NEON Inc.