The SRI Education
Afterschool Science Networks Study

SRI Afterschool Science Forum

Findings from the Afterschool Science Networks Study

SRI Education

Presentation Outline

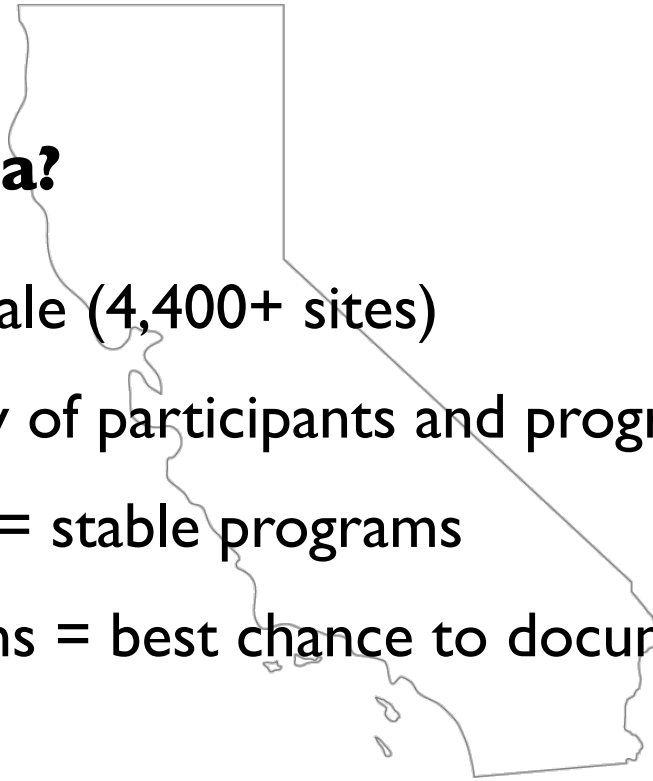
- **Purpose**
- **Context**
- **Study Design**
- **Findings**

Study Purpose

- Grounded in a social capital perspective (Coleman, 1988)
- Goal was to better understand:
  - The nature of afterschool science offerings
  - The resources and sources of support for science programming and afterschool staff development
  - Ties between offerings and external supports

Study Context

Five-year examination of informal science in **California's After School Education and Safety (ASES)** program



Why California?

- A system at scale (4,400+ sites)
- Broad diversity of participants and programs
- Stable funding = stable programs
- Stable programs = best chance to document partnerships

Study Components

Program Survey

- Gathered information regarding science offerings, science materials, and partnership. Sampled to represent ASES programs (n=415). *(2010-11)*

Case Studies

- Observed science offerings and interviewed staff, site coordinator and partners. Sampled for programs with rich and frequent science offerings (n=9). *(2011-12)*

Support Partner Survey

- Interviewed or surveyed all available organizations named by sites as science partners regarding the supports they provide (n=61). *(2012)*

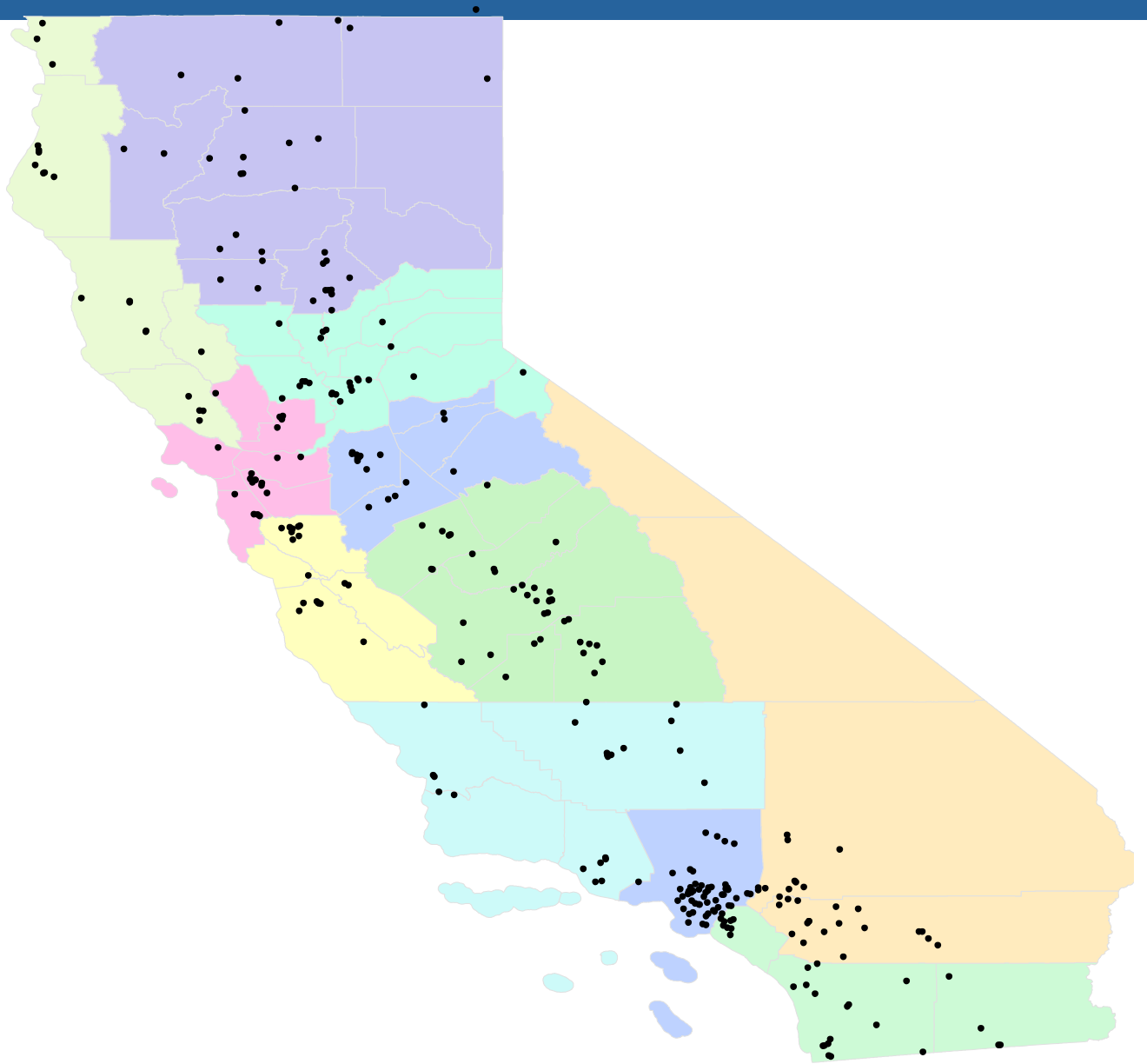
Instructional Materials Analysis

- Examined the materials sites use for science, focusing on the support features included in different types of materials. *(2013-14)*

Social Network Analysis

- Used SNA to examine connections among sites, their partners, and the partners of partners. *(2013-14)*

Program Sample



Findings Summary

Science Learning Opportunities

- ***Most sites offered science***, but activities like arts, sports, or tutoring were provided more often
- About ***half*** of sites offered science ***weekly or more***, while about another ***half*** offered science ***less than weekly***
- ***Opportunities to explore their worlds and answer their own questions were uncommon*** for youth

Science and Site Characteristics

- Four site characteristics were positively associated with more frequent science, more inquiry practices, connecting to youth's interests, and opportunities for youth choice and leadership:
  - Having a ***partner***
  - Having a ***staff member responsible for science***
  - Having ***staff members with knowledge of science***
  - Having ***staff members with knowledge of the nature of afterschool activities***

Findings Summary

Partnerships

- ***Most sites (63%) had a partner*** who supported science programming – most often community-based organizations or school districts
- ***Most sites had one partner***
- ***Training, resources, or directly leading science programming*** were the most common supports
- ***Most partners were local*** (within 50 miles) regardless of geography

Network

- ***Networks of support were not centralized or extensive***
- The network was ***generally made up of 1:1 connections***, with some signs of nascent network components

Instructional Materials

- Sites ***selected materials that were fun, easy to use, and had support features***
- Sites mostly ***used materials from the Internet and activity books***, though curriculum materials had more support features for staff members
- Sites ***planned one session at a time – even when they used curriculum***
- Sites are ***constrained by time and staff's lack of science background***

Science Learning Opportunities

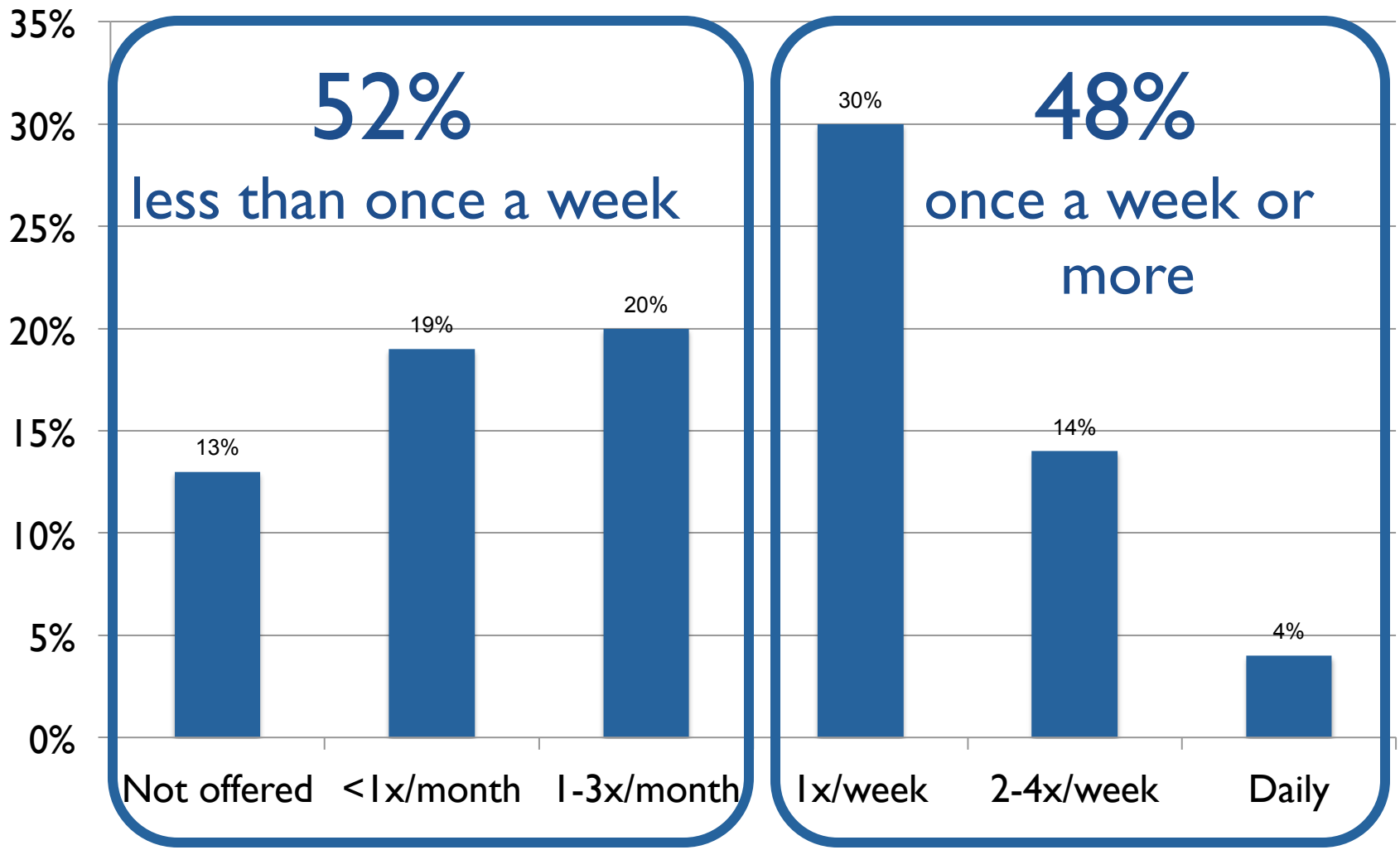
1. How much science was offered?

2. To what extent was inquiry science emphasized?

Science Offerings

	% programs offering @ least 2x per week
Homework/study time	**99%**
Sports, outdoor activities	**98%**
Arts activities	**75%**
Academically-oriented activities, projects, field trips in areas other than science	**62%**
Tutoring	**55%**
Individual counseling or mentoring	**24%**
Science-related activities, projects or trips	**18%**
Community service	**6%**

Science Offerings



Focus on Inquiry

Focus on Inquiry

Attending an ASES program that offers science: 87%

Attending an ASES program that offers science once a week or more: 41%

Attending an ASES site that offers the opportunity to learn about and explore with inquiry science: 22%

Focus on Inquiry

- While inquiry science is widely reported, case study observations and interviews provide a reality check

- **Example:** One site reported frequent offerings with inquiry-specific science activities. But case study observations found baking soda and vinegar activity and no extended investigations

- In this regard, the field is not yet where it would like to be for afterschool science. Power of Discovery addresses this, but reaching scale in California is a challenge

Supporting Partnerships

1. Who are the partners and what do they provide?
2. How prevalent are partnerships?

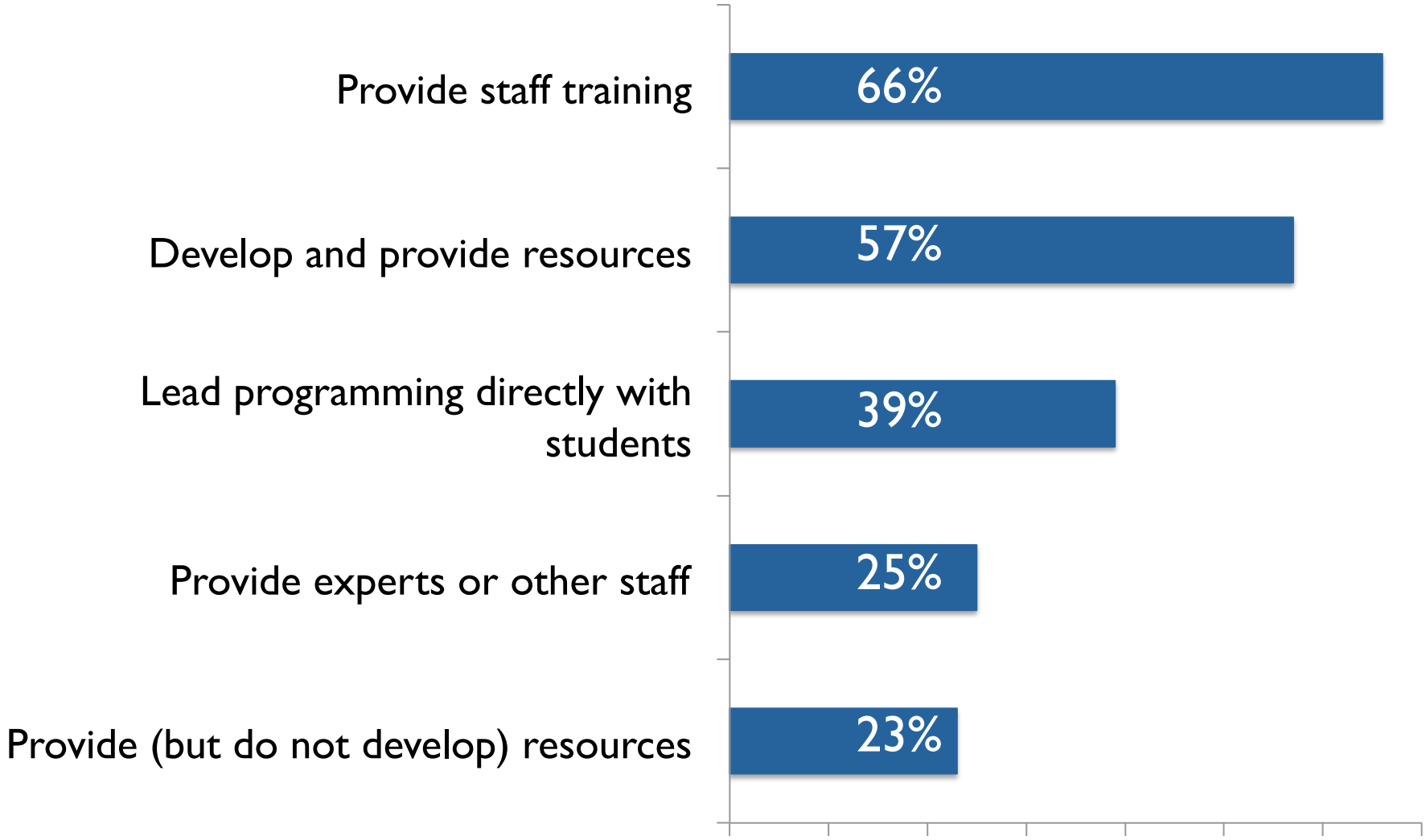
Partners and what they provide

Community-based organization/non-profit	20
County Office of Education/School District	14
Science museum/center	8
University/college/research institution	8
Federal / state / local government agencies	7

These partners also support other programs:

- 66% of partners also serve school day programs
- 60% of partners also serve summer programs

External Partner Supports



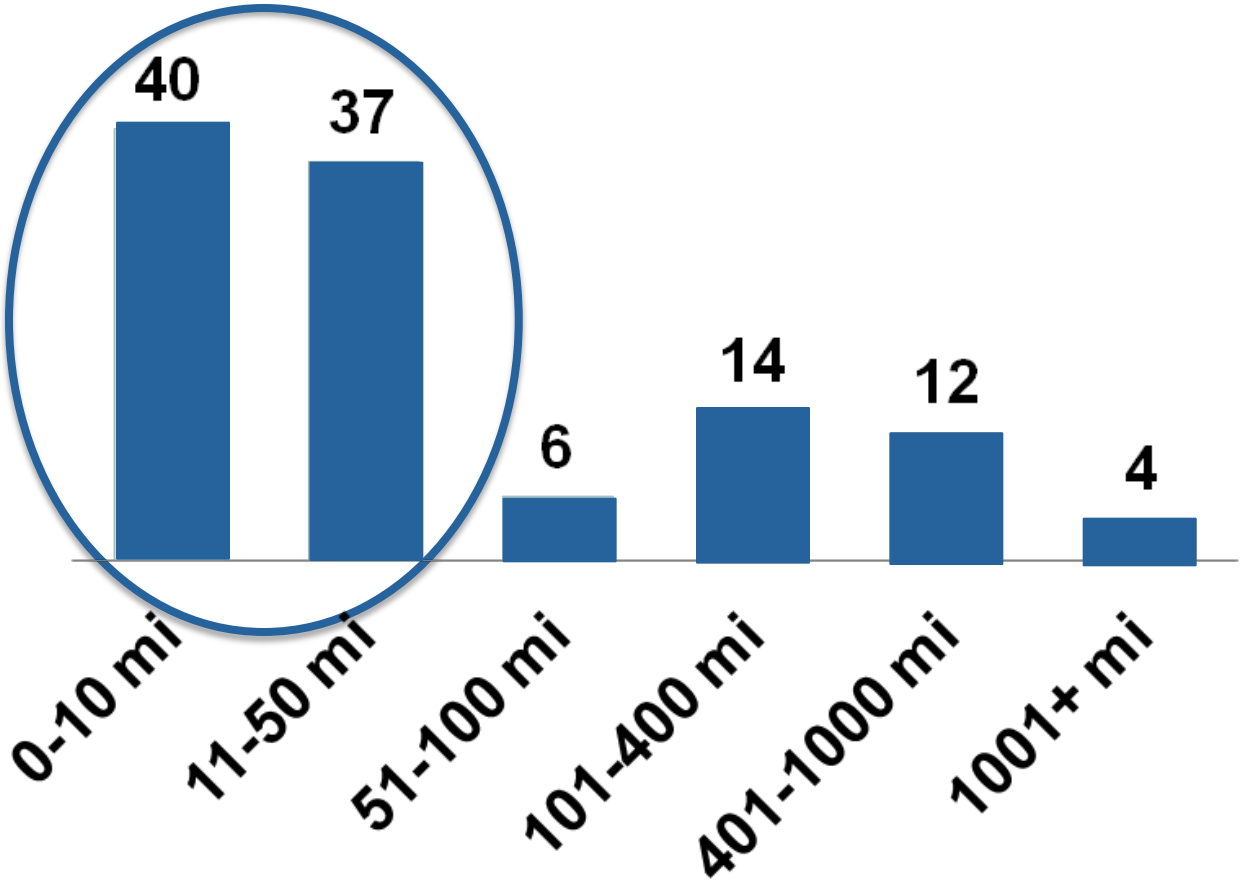
Prevalence of Partnership

Just over half the sites that offer science reported having a single partner that supports their science offerings

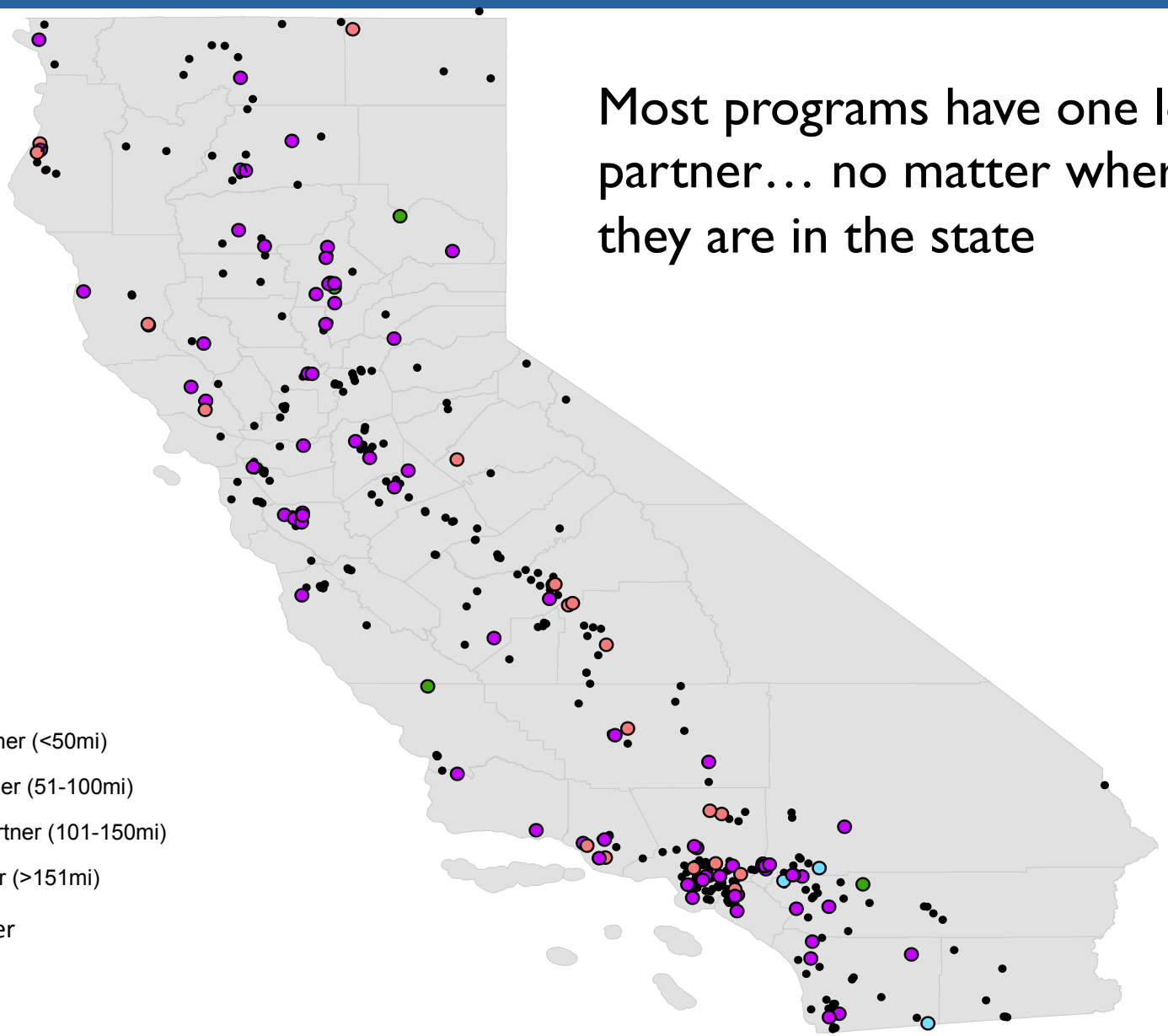
Number of support partners	Sites
0	37%
1	58%
2-4	5%

Prevalence of Partnership

Most sites were ***within 50 miles*** of their support organization



Prevalence of Partnership



Most programs have one local partner… no matter where they are in the state

Connections

1. What site variables are associated with science offerings?

2. How is partnership associated with science offerings?

Science Offerings and Site Resources

	Frequency of Science	Inquiry Practices	Connecting to student interests	Student choice/ leadership
Designated staff for science	+	+	+	+
Certified teachers		-		
Certified teachers involved in science	+			
Staff understanding of the nature of afterschool activities	+	+	+	+
Staff knowledge of science	+	+	+	+
Staff knowledge of science curricula/standards	+	+	+	+
Higher youth : staff ratio	-			
Staff turnover		-		-
Having a partner to support science*	+	+	+	+

Networks of Support

1. How extensive is the network of programs and support providers?

2. What is the composition of the network?

Prevalence of networks

Of 81 support orgs mentioned by sites

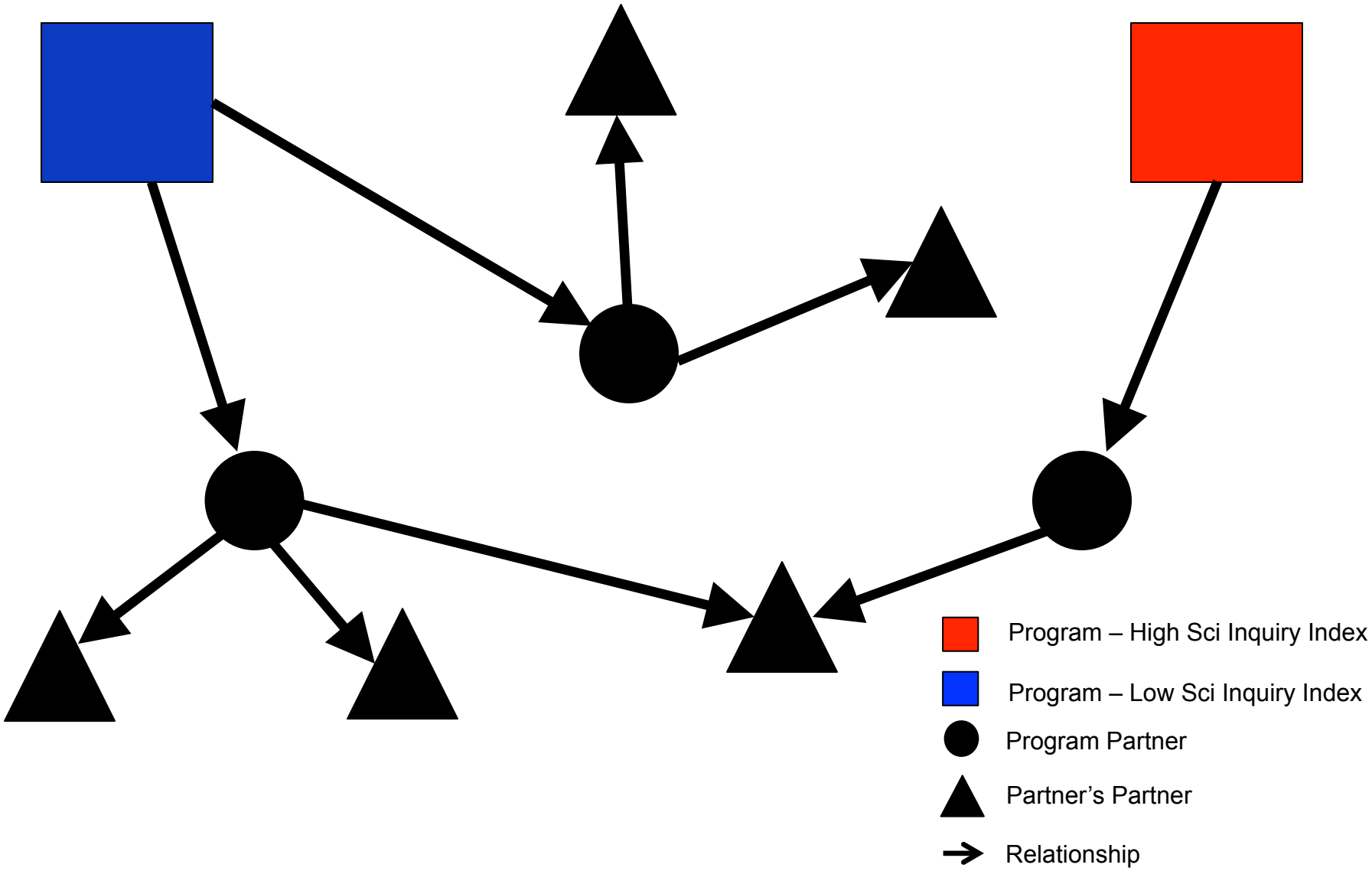
- 10 (12%) were mentioned by more than 1 site

Of the 61 support organizations surveyed/interviewed

- 14 (23%) supported 1-5 sites (most frequent response)
- 8 (13%) supported 100+ sites

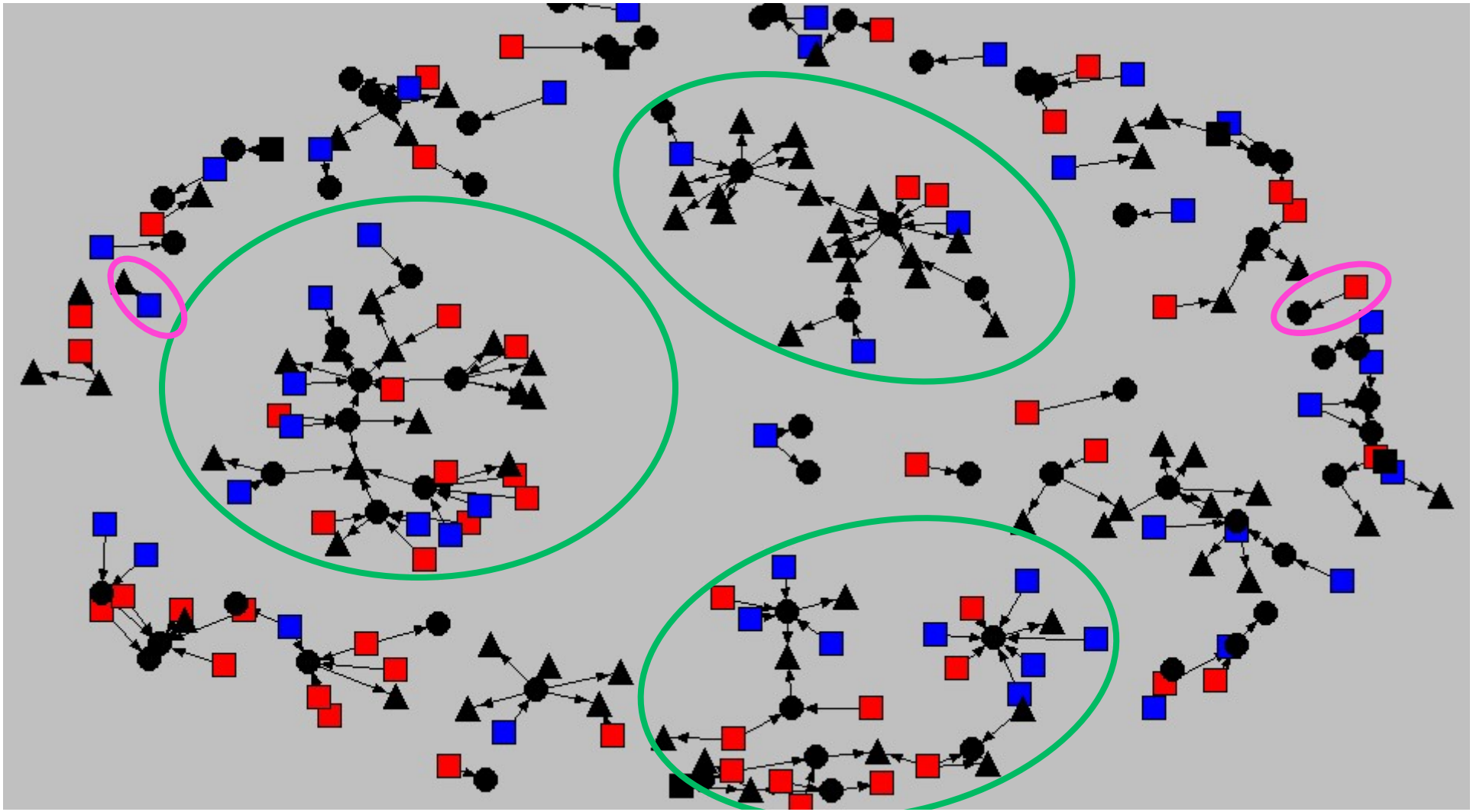
The network of support for offering science afterschool is not centralized or dense, but generally made up of sets of single, local connections

Network Composition

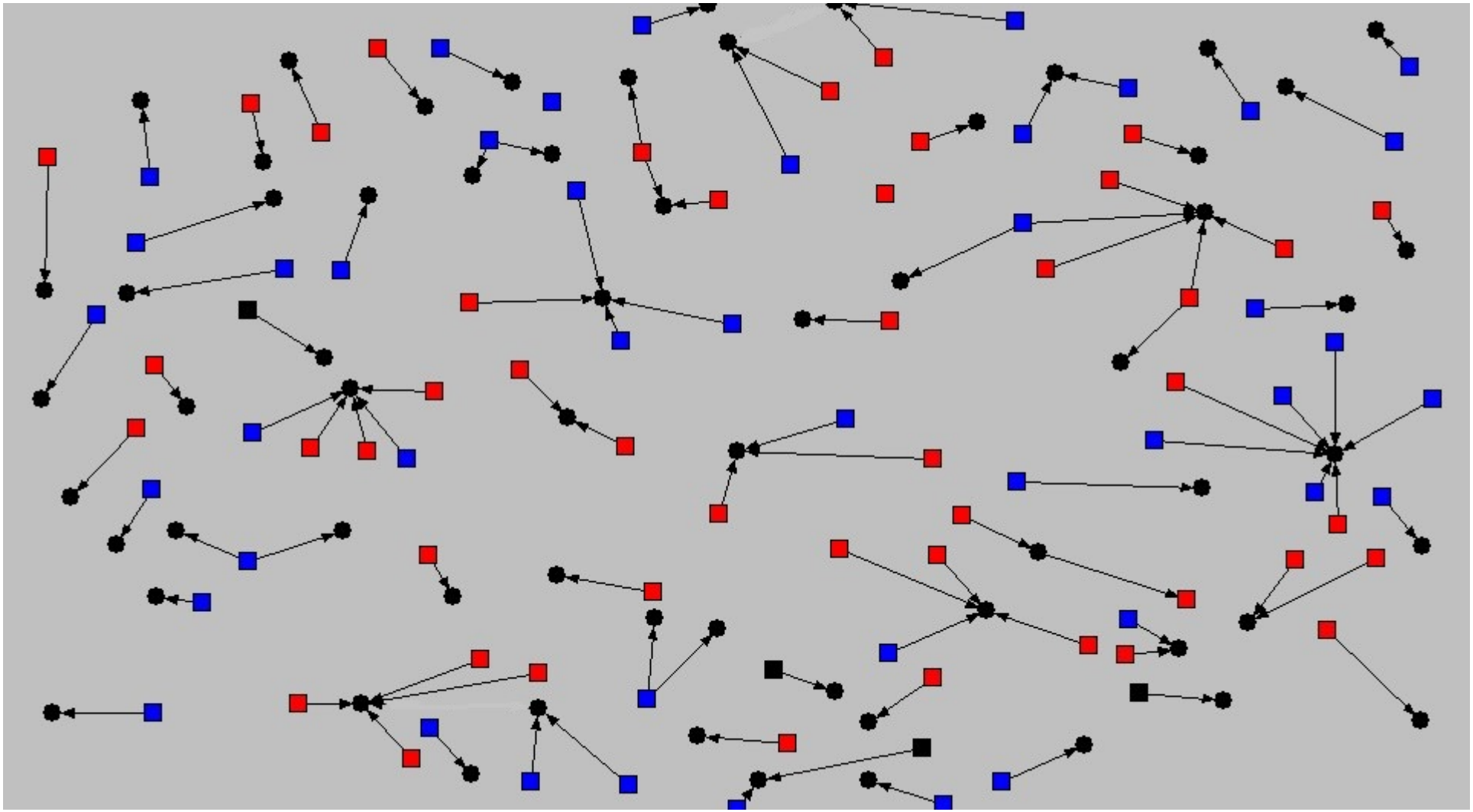


ASES Network

Beyond the many single partner connections, there were a few larger network components

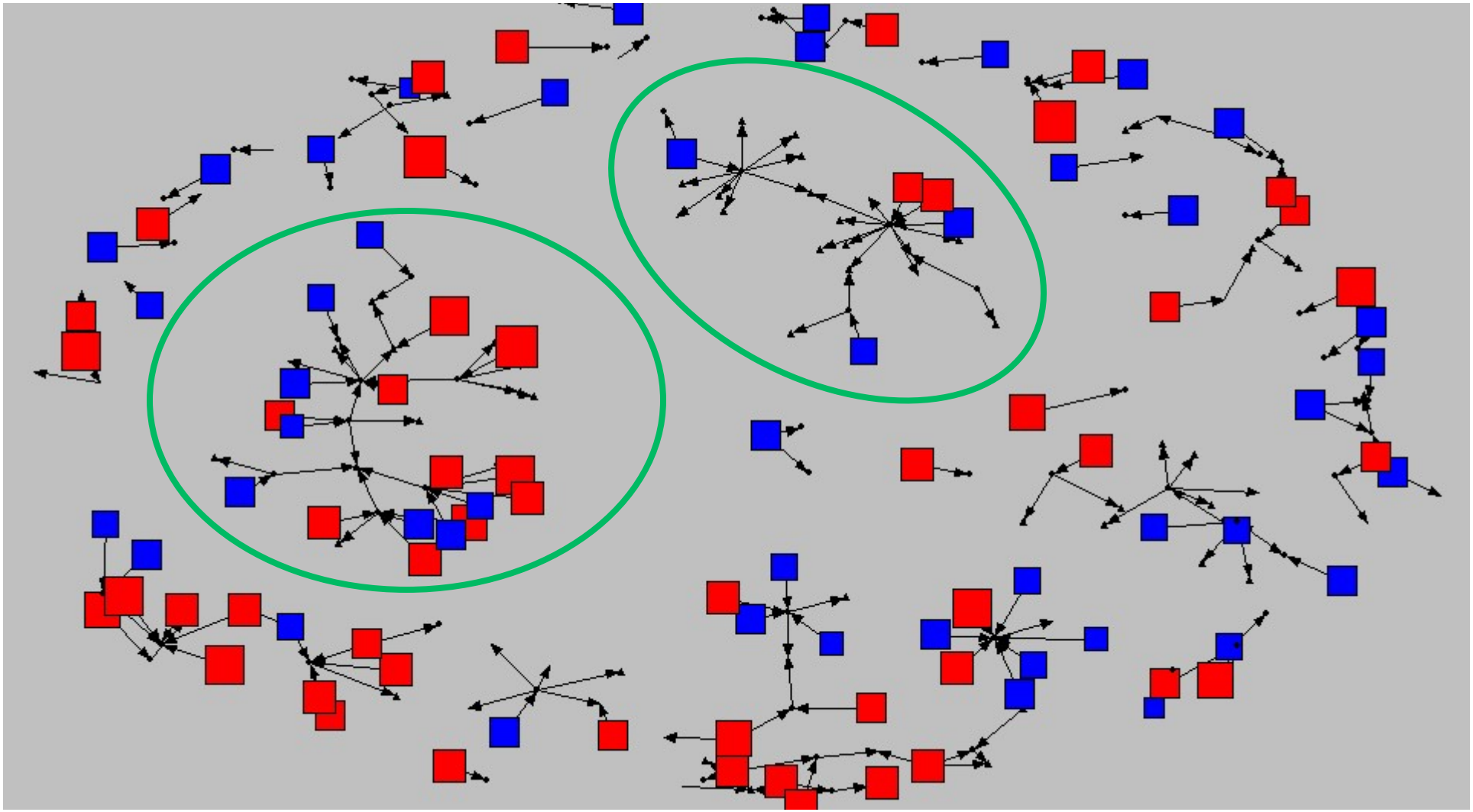


Programs and their direct partners



Network position and science offerings

Programs with high inquiry index (red) are part of more complex networks, and low index (blue) tend to be more associated with simpler ("barbell") relationships



Science Instructional Materials

1. What types of science instructional materials are used?

2. How do staff members select and plan with science instructional materials?

3. What are the support features of the science instructional materials?

Science Instructional Materials

Materials sites use for science were grouped in two categories:

27% used only curricular materials

Curricular Materials

- Designed for education settings (school or afterschool).
- Organized by units or modules comprised of sequenced activities with specifications for enactment over multiple sessions.
- Examples: out-of-school curricula, school-based curricula, and context-independent curricula

58% used only enrichment materials

Enrichment Materials

- Not designed for particular learning environments
- Stand-alone activities designed for short term use, usually not based on a logical learning sequence over time.
- Examples: lessons or activities from websites or books, trade books or media, pre-packaged science projects or kits, or self-designed

Types of instructional materials used

Material Type	Frequency	%
Out-of-school curricula	32	12.9
School-based curricula	30	12.0
Context independent curricula	8	3.2
Lessons or activities from websites	62	24.9
Lessons or activities from books	50	20.1
Trade book or media	7	3.2
Pre-packaged science projects or kits	21	8.4
Site developed material or activity	36	14.5
General enrichment (source unknown)	3	1.2

Selecting and using science instructional materials

Based on interviews with 13 staff,

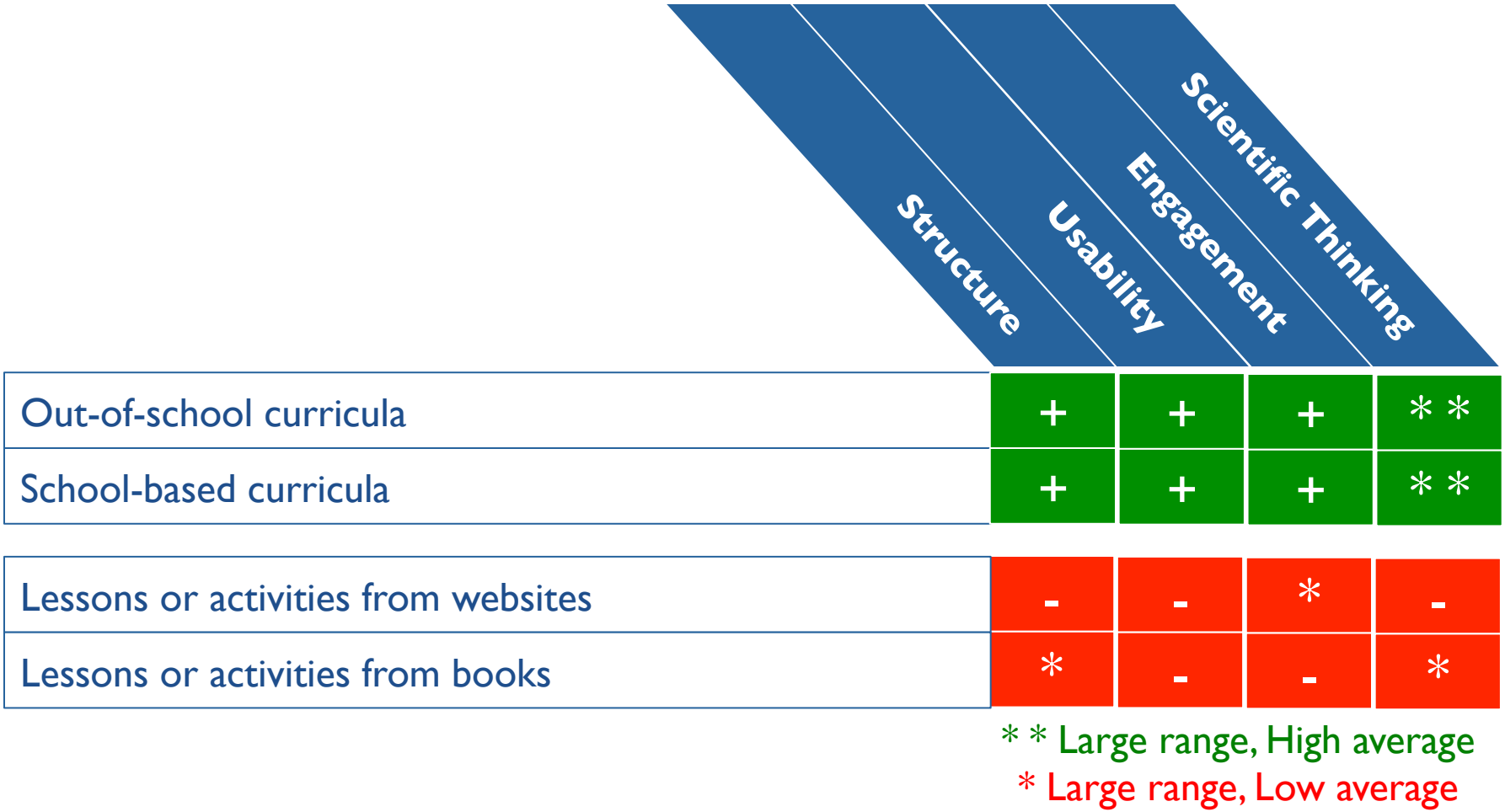
- **Site staff look for materials that:**
  - are fun, engaging
  - are easy to use
  - include supports for enactment
- **Constraints:**
  - lack of time for preparation and implementation
  - facilitator's lack of science background
- **Main approach:**
  - find a stand-alone activity for a particular day or session (even when using curricular materials)

Support features of science instructional materials

Samples of materials were collected and examined for evidence of support features:

- **Structure:** Features that help facilitators structure the science activities into a coherent storyline for learning
- **Usability:** Features that support enactment and accessibility, including accessibility for diverse populations
- **Engagement:** Features that attempt to bridge science to children's everyday social and physical world
- **Scientific Thinking:** Supports and prompts for facilitators to help children think and reason about their science experiences and effectively reflect on their science learning

Support Features of Science Instructional Materials



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Project Partners

California Afterschool Network

Joseph Ames, Ames & Associates

Steve Fowler, FowlerHoffman LLC

Inverness Research

Advisors

- Bronwyn Bevan, Exploratorium
- Kevin Crowley, University of Pittsburgh
- Ken Frank, Michigan State University
- Diane Miller, St. Louis Science Center
- Leona Schauble, Vanderbilt Peabody College
- Karen Stephenson, Independent Consultant
- Nicole Yohalem, Forum for Youth Investment
- Claudia Weisburd, Independent Consultant

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