Arctic LTER Project

The Arctic LTER Project: Mid-term Site Review 18-19 June 2013

Welcome everyone

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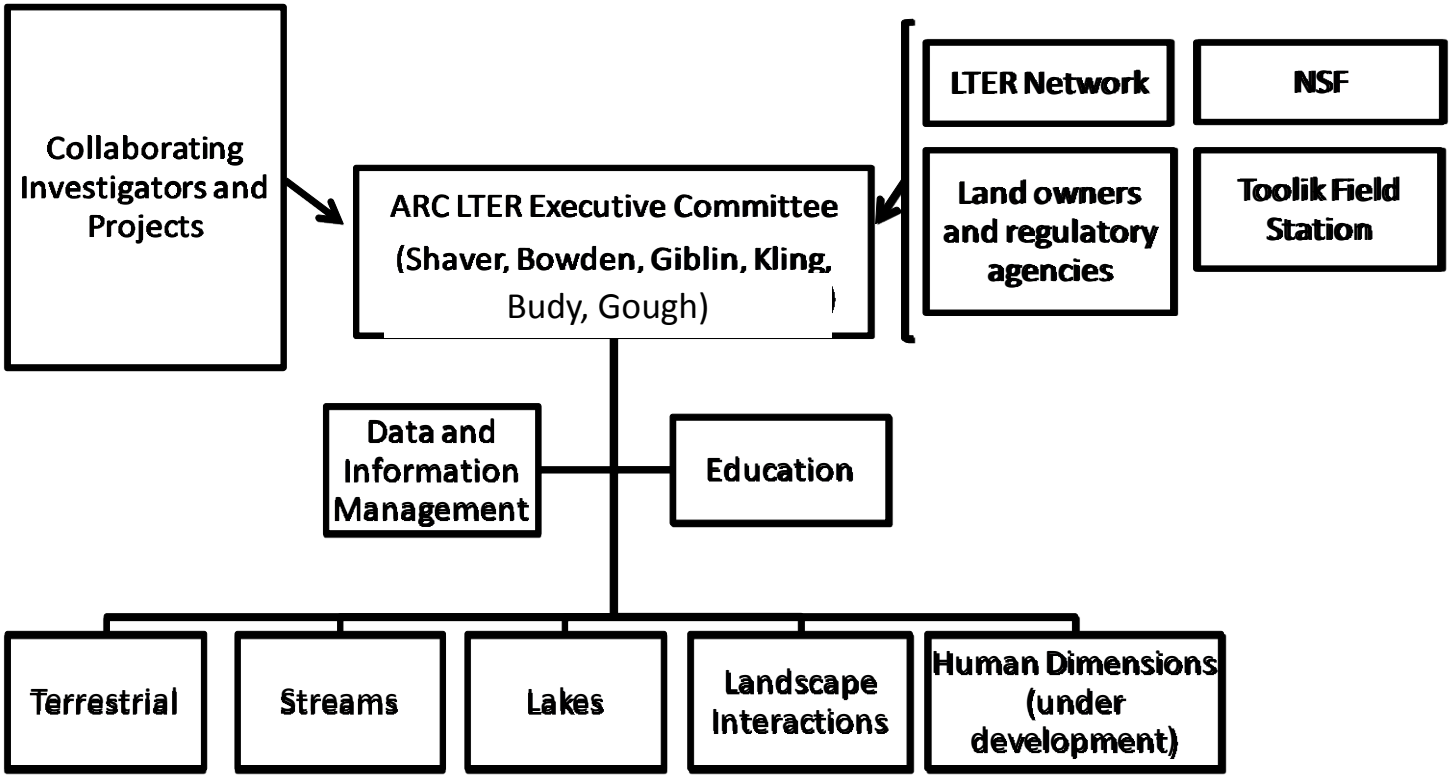
The Arctic LTER Project: Mid-term Site Review 18-19 June 2013

Project Management
Budget & Logistics
Information Management
Education, Training, & Outreach
Self critique—challenges and changes

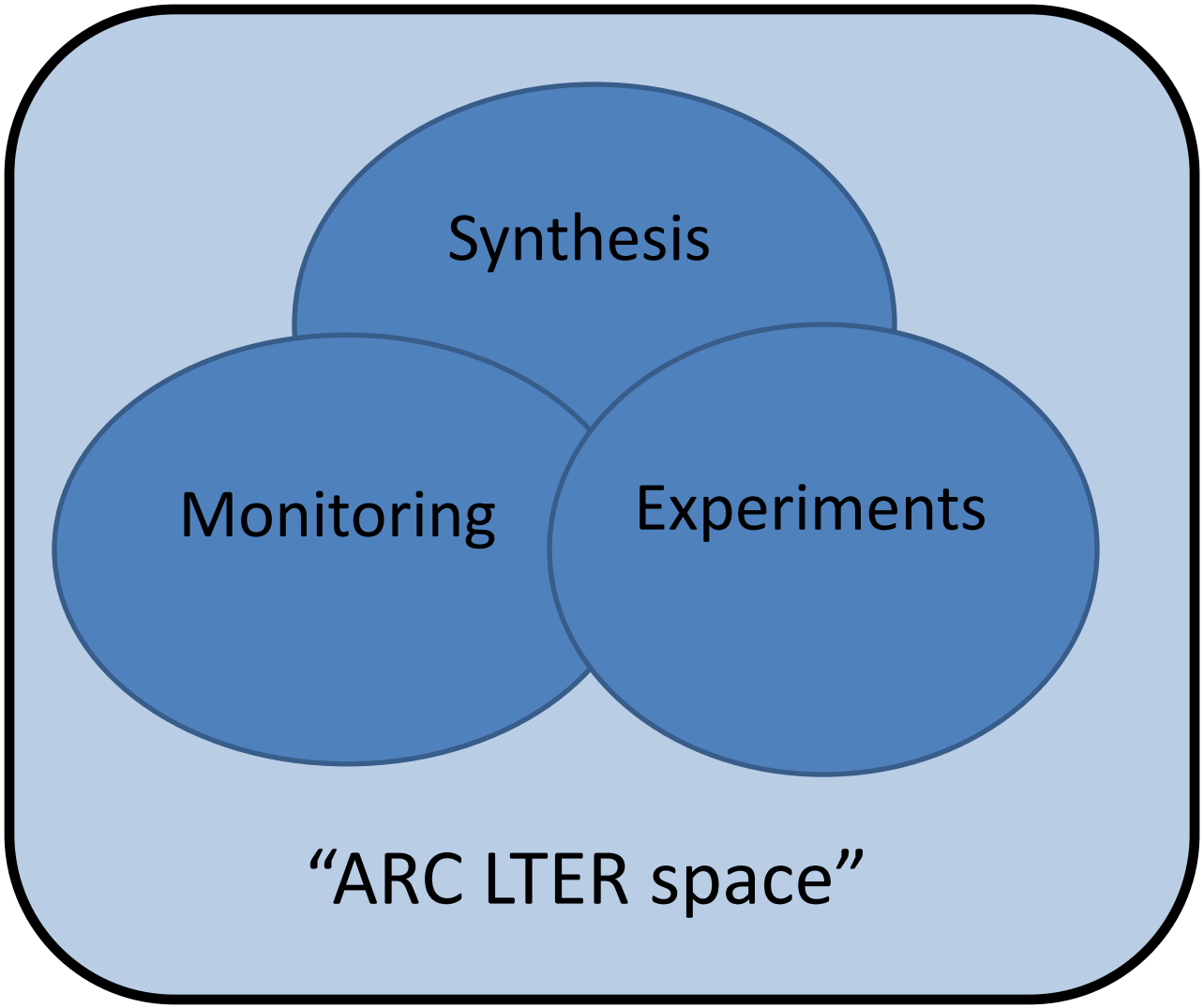
Management:
Project personnel and roles

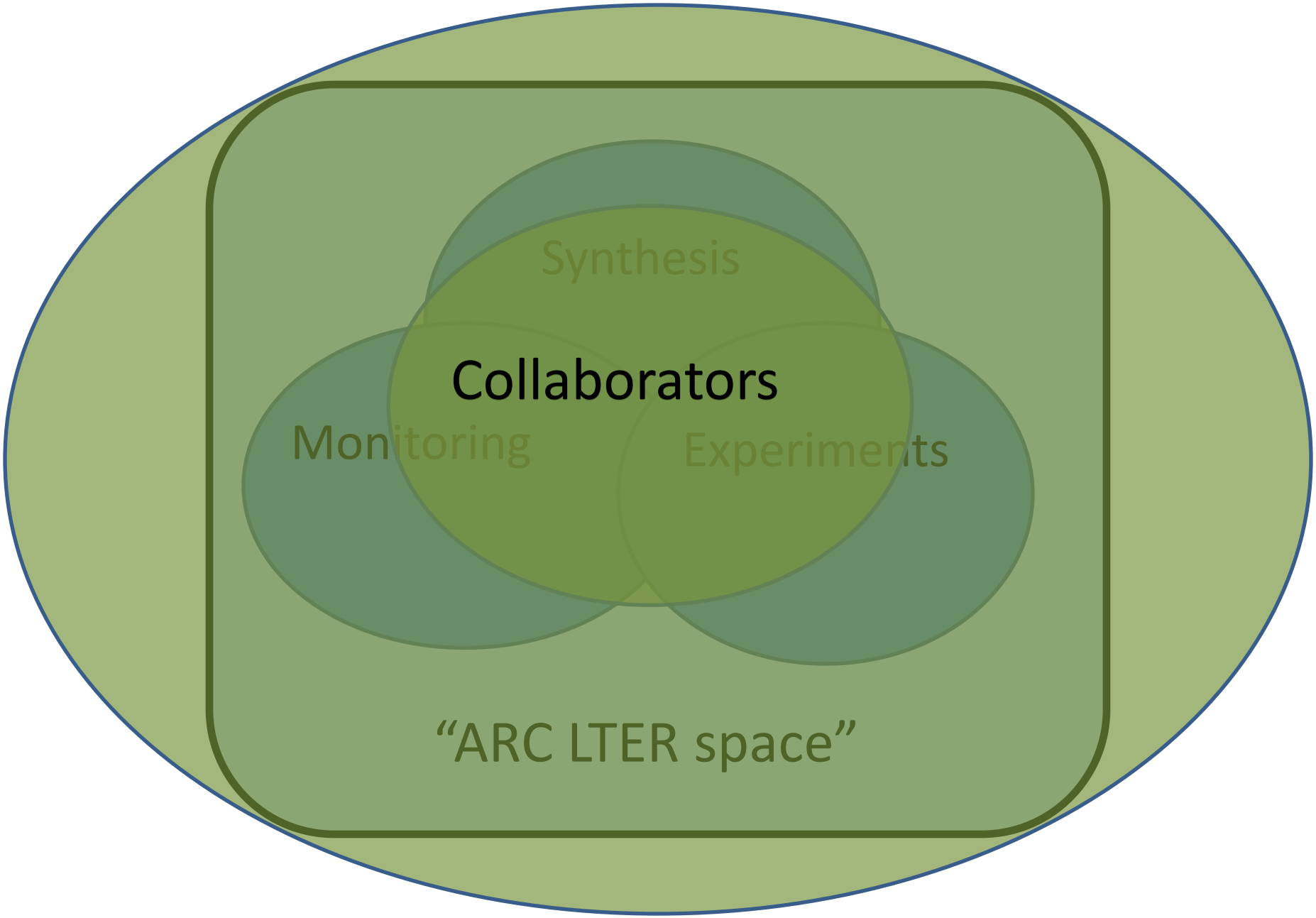
- Lead PI
- Exec Comm
- Collaborating PIs
- New investigators
- RAs
- Students
- Collaborating project personnel

Figure 3-1. Organizational structure of the ARC LTER project. The Executive Committee manages the allocation of project resources among research, data, and education components in response to the needs of the collaborating investigators and projects. The EC also interacts with the LTER Network Office, with other networks, and with NSF; it responds to requests for information or collaboration, and it prepares annual reports and other communications.



How does it work?




Synthesis
Collaborators
Monitoring
Experiments
“ARC LTER space”

Project Budget: $980,000/y

- Core Research (including Data and IM)
  - Monitoring
  - Experiments
  - Data and IM
- Synthesis
- New Investigators and new topics
- Broader Impacts including Education (budget now includes Schoolyard, REU supplements)
- Annual meeting in Woods Hole
- Annual supplemental funding (usually)

Project Budget: $980,000/y

- In practice, budget is divided ~equally among Lakes, Streams, Terrestrial, and Land-Water Groups
- Each group receives funding for one full-time RA, one summer RA, and one month PI time (Lead PI gets 2 months)
- Supplies, travel, and other costs divided ~equally among groups
- Information management is mostly accomplished by groups, with overall coordination by an Info Mgr (Jim Laundre, Terrestrial RA)

Project Budget: $980,000/y

- Core funding for shared chemical-analytical costs
- Core funding for PIs, collaborators' travel and participant support
- Core funding for Education, Outreach, New Investigators, unfunded collaborators (travel and user days, some supplies)
- Core funding for synthesis projects (travel, communications)
- Some funds (~$15K) reserved each year for Social Science
- Schoolyard and REU funds (2 students/y) now in core budget
- Annual meeting costs ~$35,000/y
- Annual Supplemental funds allocated according to availability (every year is different; in 2013 none requested)

MBL Ecosystems Center Proposal Budget

		YR1		YR2		YR3		YR4		YR5		YR6	TOTAL
A. SENIOR PERSONNEL	PER-MOS	FUNDS	PER-MOS	FUNDS	PER-MOS	FUNDS	PER-MOS	FUNDS	PER-MOS	FUNDS	PER-MOS	FUNDS	FUNDS
TOTAL SENIOR PERSONNEL	2.7	**$35,424**	2.61	**$35,424**	2.48	**$35,424**	2.39	**$35,424**	2.31	**$35,424**	2.21	**$35,424**	**$212,544**
B. OTHER PERSONNEL													
TOTAL SALARY AND WAGES (A+B)	37.7	**$169,992**	37.61	**$175,194**	37.48	**$179,765**	36.89	**$181,990**	36.81	**$186,490**	36.71	**$190,990**	**$1,084,421**
C. FRINGE BENEFITS	0.354	**$60,177**		**$62,019**		**$63,637**		**$64,424**		**$66,017**		**$67,610**	**$383,885**
TOTAL SALARY, WAGES AND FRINGE		**$230,169**		**$237,213**		**$243,402**		**$246,414**		**$252,507**		**$258,600**	**$1,468,306**
D. PERMANENT EQUIPMENT													
TOTAL PERMANENT EQUIPMENT		**$0**		**$0**		**$0**		**$0**		**$0**		**$0**	**$0**
E. TRAVEL	*Domestic*	**$34,500**		**$41,000**		**$40,000**		**$38,000**		**$36,000**		**$33,565**	**$223,065**
	Foreign	**$0**		**$0**		**$0**		**$0**		**$0**		**$0**	**$0**
TOTAL TRAVEL		**$34,500**		**$41,000**		**$40,000**		**$38,000**		**$36,000**		**$33,565**	**$223,065**
F. PARTICIPANT SUPPORT COSTS													
STIPEND		**$10,000**		**$10,000**		**$10,000**		**$10,000**		**$10,000**		**$10,000**	**$60,000**
TRAVEL		**$20,500**		**$23,000**		**$20,500**		**$23,000**		**$23,000**		**$23,000**	**$133,000**
SUBSISTENCE		**$5,000**		**$7,500**		**$5,000**		**$7,500**		**$5,000**		**$5,000**	**$35,000**
OTHER		**$24,500**		**$24,500**		**$24,500**		**$24,500**		**$24,500**		**$24,500**	**$147,000**
TOTAL PARTICIPANT COSTS		**$60,000**		**$65,000**		**$60,000**		**$65,000**		**$62,500**		**$62,500**	**$375,000**
G. OTHER DIRECT COSTS													
MATERIALS AND SUPPLIES		**$39,000**		**$45,500**		**$43,000**		**$39,000**		**$38,000**		**$38,000**	**$242,500**
SUBCONTRACTS		**$349,562**		**$349,568**		**$349,908**		**$349,578**		**$349,199**		**$346,679**	**$2,094,494**
OTHER		**$23,473**		**$28,581**		**$28,795**		**$28,874**		**$27,574**		**$25,487**	**$162,784**
TOTAL OTHER DIRECT COSTS		**$412,035**		**$423,649**		**$421,703**		**$417,452**		**$414,773**		**$410,166**	**$2,499,778**
H. TOTAL DIRECT COSTS		**$736,704**		**$766,862**		**$765,105**		**$766,866**		**$765,780**		**$764,831**	**$4,566,149**
I. TOTAL INDIRECT COSTS		**$243,296**		**$213,138**		**$214,895**		**$213,135**		**$214,220**		**$215,170**	**$1,313,853**
J. TOTAL DIRECT AND INDIRECT		**$980,000**		**$979,999**		**$979,999**		**$980,001**		**$980,000**		**$980,001**	**$5,880,002**

Logistical Support

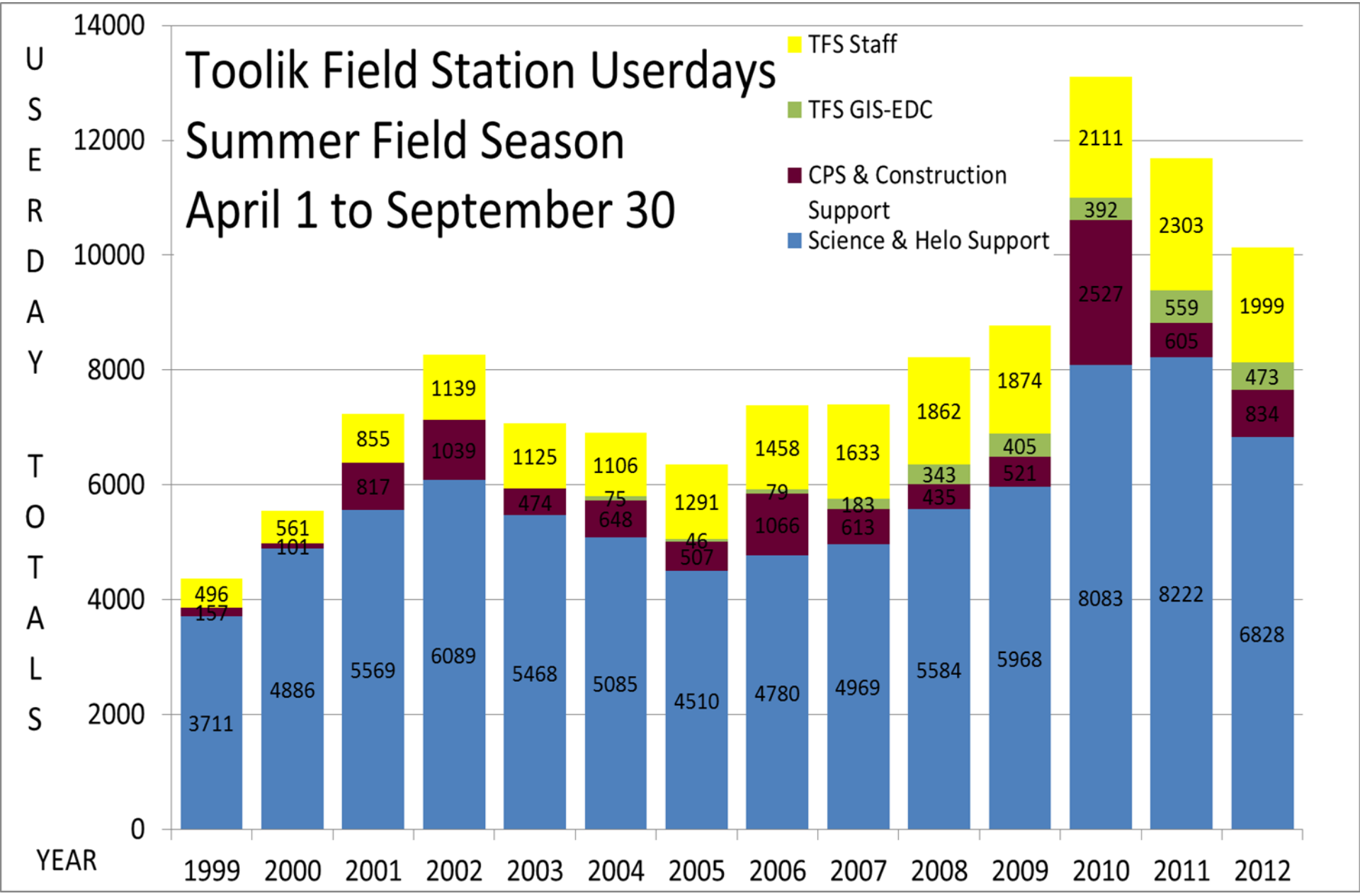
- Vital component of our overall funding
- Provided by NSF Office of Polar Programs

Logistics

- TFS USER DAYS: Includes room and board, lab use, diverse research support services @ TFS and in Fairbanks
  - 960 days/y total; ~200 days each for Lakes, Streams, Terr, L-W, ~160 days/y for core/joint activities
    - 750 days/y for summer & year round RAs or students
    - 2x70 days/y for REUs
    - 70 days/y for PIs, Collaborators
  - Collaborating projects provide most or all of their user days
- Helicopter time: 25-40 hours/year
  - Supports survey work, remote monitoring, equipment hauling
  - Allocation varies each year
  - Often shared with collaborating projects (personnel fly and work together)
- Other “off pad” support:
  - Main service for ARC LTER is boardwalks @ field sites;
  - Other services can be requested (e.g., remote power)

ARC LTER Collaborations and logistics summary, 2011 & 2012

	Project	PI	User days	Helo hrs
2011 Logistics				
	ARC LTER	Shaver	960	25
	AON1 (MBL+UAF)	Shaver	800	0
	ITEX	Shaver	250	18
	AR Burn	Shaver	592	80
	Macrosystems	Shaver	125	0
	LTREB (Crump/Kling)	Crump	310	13
	Photochemistry (Cory/Kling)	Kling	280	20
	Boelman/Gough/Wingfield ("Team Bird")	Boelman	532	2
	Gough/Moore ("Biotic Awakening")	Gough	369	0
	Thermokarst (including Kling)	Bowden	883	69.5
	Streams seasonality	Bowden	378	32
	Fishscape Deegan et al.	Deegan		
	2011 Total:		**5479**	**259.5**
2012 Logistics				
	LTER	Shaver	960	25
	AON2 (MBL+UAF+UMich)	Shaver	725	0
	Macrosystems	Shaver	250	20
	LTREB (Crump/Kling)	Crump	330	15
	Photochemistry	Kling	280	20
	Team Bird (including Gough)	Boelman	601	2
	Biotic Awakening	Gough	362	0
	Streams seasonality	Bowden	252	18
	Fishscape Deegan et al.	Deegan		
	2012 Total:		**3760**	**100**
Additional projects for which a letter of collaboration exists or which claim collaboration in 2011 or 2012:				
	MacIntyre 3 projects	Tang Soil Rs (Pending)		
	Weintraub et al Seasonality	Rastetter/Shaver/Kling Hillslopes (pending)		
	McGraw/Fetcher Ecotypes			
	Hu et al. Paleo/burn			
	Girffin Plant Rs			


Toolik Field Station Userdays
Summer Field Season
April 1 to September 30
TFS Staff
TFS GIS-EDC
CPS & Construction Support
Science & Helo Support
USERDAY TOTALS
YEAR
14000
12000
10000
8000
6000
4000
2000
0
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
496
157
3711
561
101
4886
855
817
5569
1139
1039
6089
1125
474
5468
1106
75
648
5085
1291
46
507
4510
1458
79
1066
4780
1633
183
613
4969
1862
343
435
5584
1874
405
521
5968
2111
392
2527
8083
2303
559
605
8222
1999
473
834
6828

Arctic LTER Information Management

Principal aims:

1. Provide quality data for research that are accessible and well documented.
2. Optimize data usability and integration for within-site synthesis, for modeling and regional and long-term scaling, and for multisite or global comparisons and syntheses.

Meeting the above aims will ensure the integrity and usability of data and metadata for future generations (goal 2 of LTER network information management).

Overall IM Design

- Each full-time research assistant (RA) is deeply involved in the actual research design, day-to-day management, and data collection and management within their area.
- A Senior RA (Jim Laundre) is the overall project information manager with responsibility for overseeing the integrity of the ARC information system and serving as the LTER Network representative.

Metadata/data workflow

1. Data management begins with the design and implementation of a research project.
2. When data are ready for distribution researchers submit an Excel worksheet that was developed for metadata and data. The worksheet provides hints and selection choices for describing data.
3. The metadata and data are then checked by an information manager (one of the four RAs) using a script to check for common errors. Then the necessary files for inclusion on the Arctic LTER and LTER network web sites are generated.

Arctic LTER Database Status

- Currently there are ~700 datasets available at both Arctic LTER and LTER network web sites. About half are also available in the new LTER Data Portal (PASTA) with the rest being added over the summer.
- Datasets are freely accessible and include both data and metadata.
- In our review of the data for the new data portal we were able to consolidate multisite and multiyear data files.

Future Improvements

- Move to a content management system: Drupal DEIMS. The advantages are:
  - A community supported system with tools and scripts that are used by several LTER sites.
  - Robust searching and data access, supplementing the new LTER network data portal.
  - More project management tools (calendars, blogs, online metadata entry)
- Develop workflows for sensor management and data collection. Several LTER sites use Kepler to manage sensors.
- Continue adding collaborators' data sets to ARC data base
- Prepare for closer integration with TFS and Toolik-NEON data systems

Education, Training, and Outreach

- REUs, Grad Students, Postdocs
- New Investigators
- Schoolyard lecture series @ Barrow
- Science Journalism program w/ MBL (C Neill)
- K-12 teacher program w/ CSU (J Moore)
- PolarTrec teacher program (via NSF-OPP)
- Land of Extremes: A Natural History of the North Slope of Alaska
- Federal and State Agencies Land Use Planning and Management
- National and International Research Planning and Management

Self critique— Challenges and solutions

- New Lead PI, Exec Comm
- Social Science
- Schoolyard
- Off-pad logistics
- Coordination and collaboration especially with other Networks (NEON, AON) and with TFS.

New lead PI

- Current project ends 1 March 2017; Shaver retires
- Renewal proposal due winter 2016
- Start writing proposal by winter 2015
- Identify new lead PI by winter 2014
- Challenge 1: Identify candidates
  - Lead PI is discussing this with potential candidates
  - Project collaborators have been asked to comment, nominate, or volunteer
  - Informal discussion with colleagues
  - Final choice will be by Exec Comm, after consultation with collaborators
- Challenge 2: Identify lead institution
  - Keeping ARC at MBL will require funding a new position
  - Decision will depend on what is best for project
- Challenge 3: Identify new theme before/after choosing new PI?

A changing ARC Exec Comm

- Recent recruits include Budy (Lakes) and Gough (Terrestrial)
- Will need to replace Giblin, Bowden, and Kling before the end of the next funding period
- Need to build experience among collaborators; currently including rotators at Exec Meetings, Network SC meetings

Social-Ecological Studies related to ARC LTER

- Original plan: build slowly as we have done for other new investigators
- Use Annual Supplemental Funding to develop program where possible
- Build a link via the ISSE effort under way at time of last renewal
- Focus of effort:
  - Climate change and native use of lands and freshwaters
  - Understanding mixed subsistence-cash economies
  - Understanding adaptation and adaptive capacity of Native economies/social systems

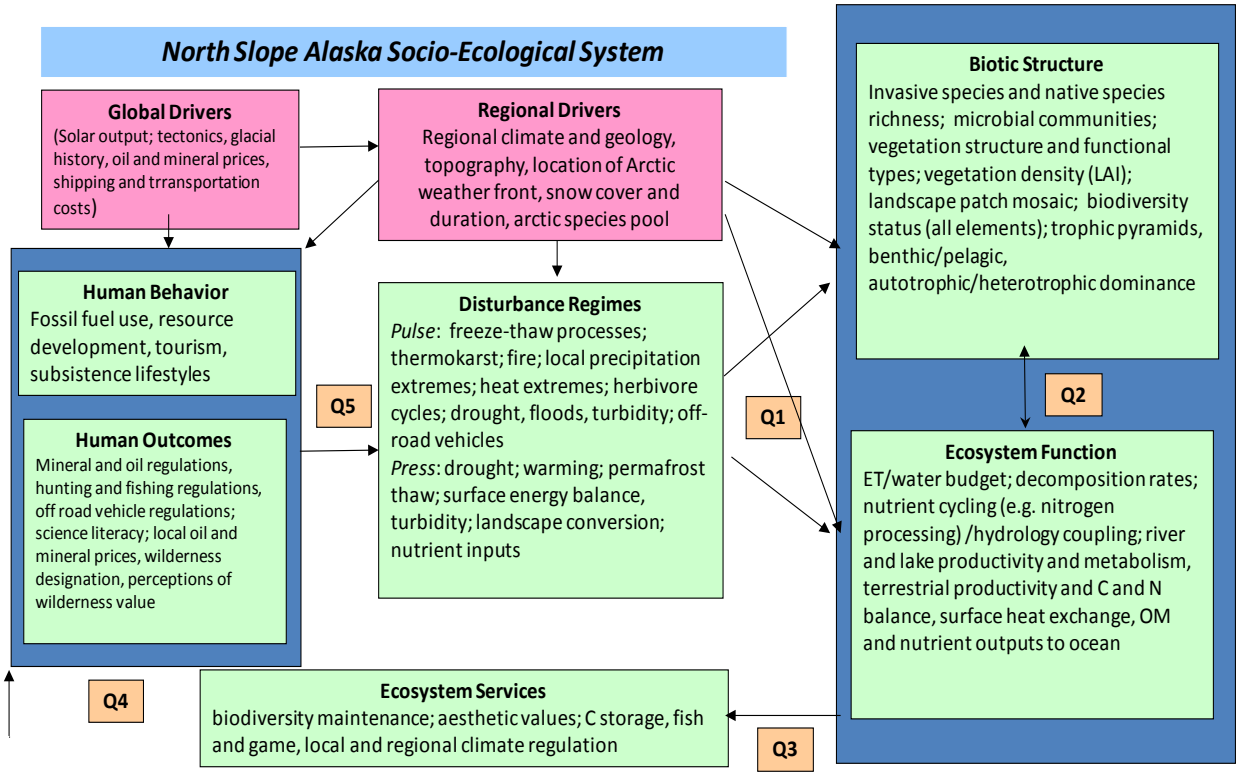


Fig 2-33. The proposed ARC LTER research translated into the framework of the LTER Network's planned Integrated Science for Society and the Environment (ISSE) research. Here the five core questions driving research that links the main components of the system are:

Q1: How do disturbances in climate and surface energy balance affect structure and function of terrestrial and aquatic systems both directly through changes in temperature and indirectly through changes in biogeochemistry?

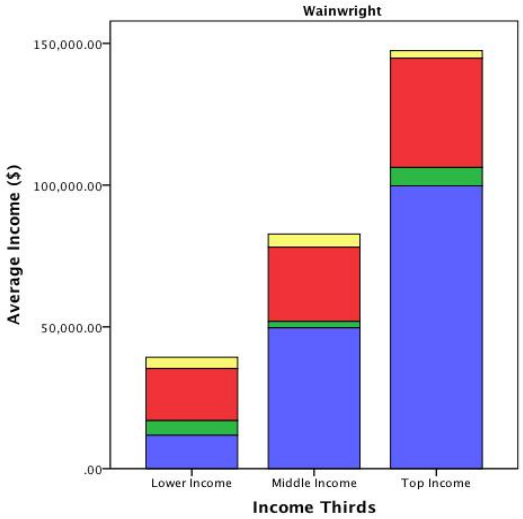
Q2: How do changes in community composition feed back both positively and negatively on changes in nutrient cycling and availability in response to climate and disturbance?

Q3: How do changing terrestrial and aquatic ecosystems affect the attractiveness of the arctic landscape to tourists, its ability to meet needs of subsistence users, and its suitability or profitability for commercial exploitation?

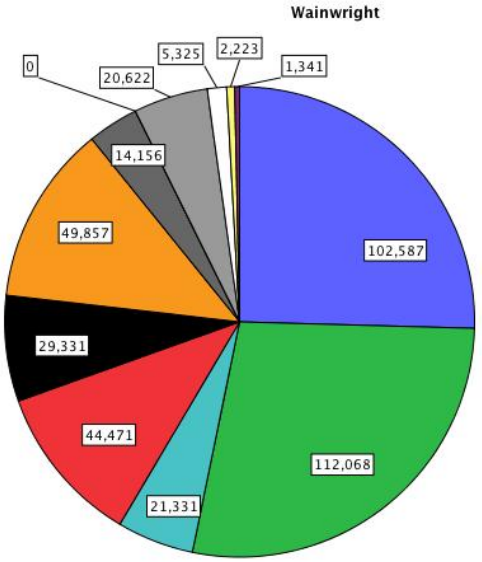
Q4: How do local inhabitants and human populations outside the Arctic perceive or use these ecosystem services and how they change, and how do these perceptions affect their use or enjoyment of the arctic landscape?

Q5: How do humans decisions, actions, and regulations affect disturbance regimes?

Mixed Subsistence-Cash Economies are important features of the Arctic's Social-Ecological Systems in Alaska

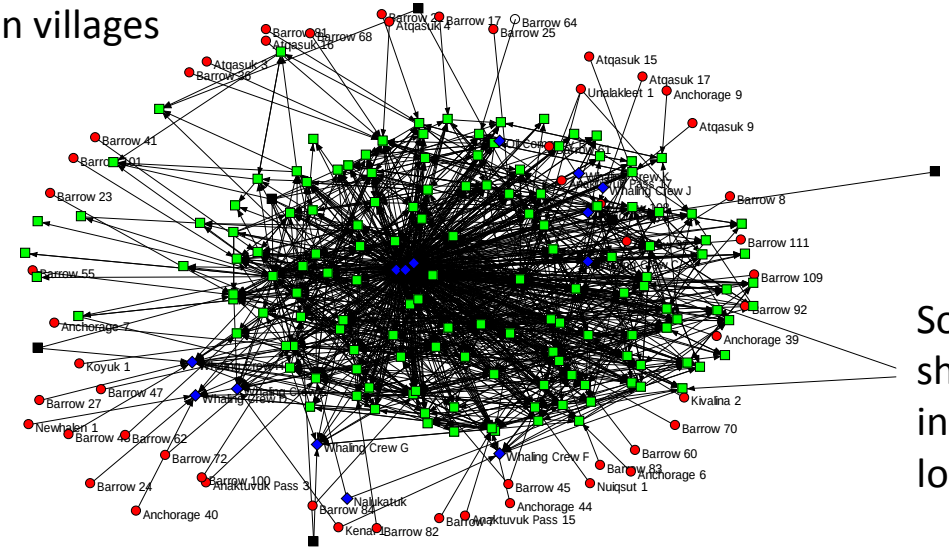


There is a diversity of HH cash inputs in villages



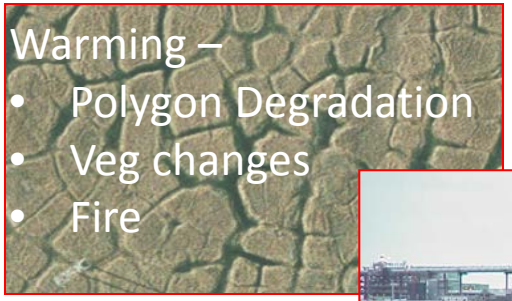
¾ of all inflows to HHs are from social relations (sharing, cooperative hunting); only ¼ from own harvesting

Sharing Project: Kofinas, BurnSilver, Magdanz



Social networks of sharing are extensive, including local and non-local HHs

How resilient are villages to changes in land cover, land use, and economies?



Changes in Ecosystem Services
(Infrastructure; Harvested resources; Access to hunting grounds)

Assessing Adaptive Capacity
Human capital; Technology; social organization; Institutional

Possible Village-level Transformations
Ecological Transformations: Δ in key species and mode of subsistence harvesting
Economic Transformations: Mixed to cash only based economy
Ethnic Transformation: Indigenous to a community of mixed ethnicity
Cultural Transformation: loss of indigenous spoken language
Settlement Transformation: Permanent -> to holiday settlements or unviable settlement

Method
- Participatory mapping
- Agent-based modeling
- Structured Decision making

ACE /EPSCoR
(Alaska Adapting to Changing Environments)

Off-pad issues

Permitting

Logistics

Overlapping research interests

Needs:

- Clear, common authority for off-pad issues
- Overall land use plan and authority
- Toolik Scientific Steering Commitee

Collaborations

- Current collaborators include:
  - long-time senior investigators with long records of research at Toolik Lake and collaboration with ARC
  - Early- and mid-career investigators trained at Toolik Lake
  - “New investigators” recruited by ARC
  - “New investigators” who are also new to Toolik Lake and Arctic research
  - Range of commitments to ARC, Arctic research, and working at Toolik

Challenges with collaborations

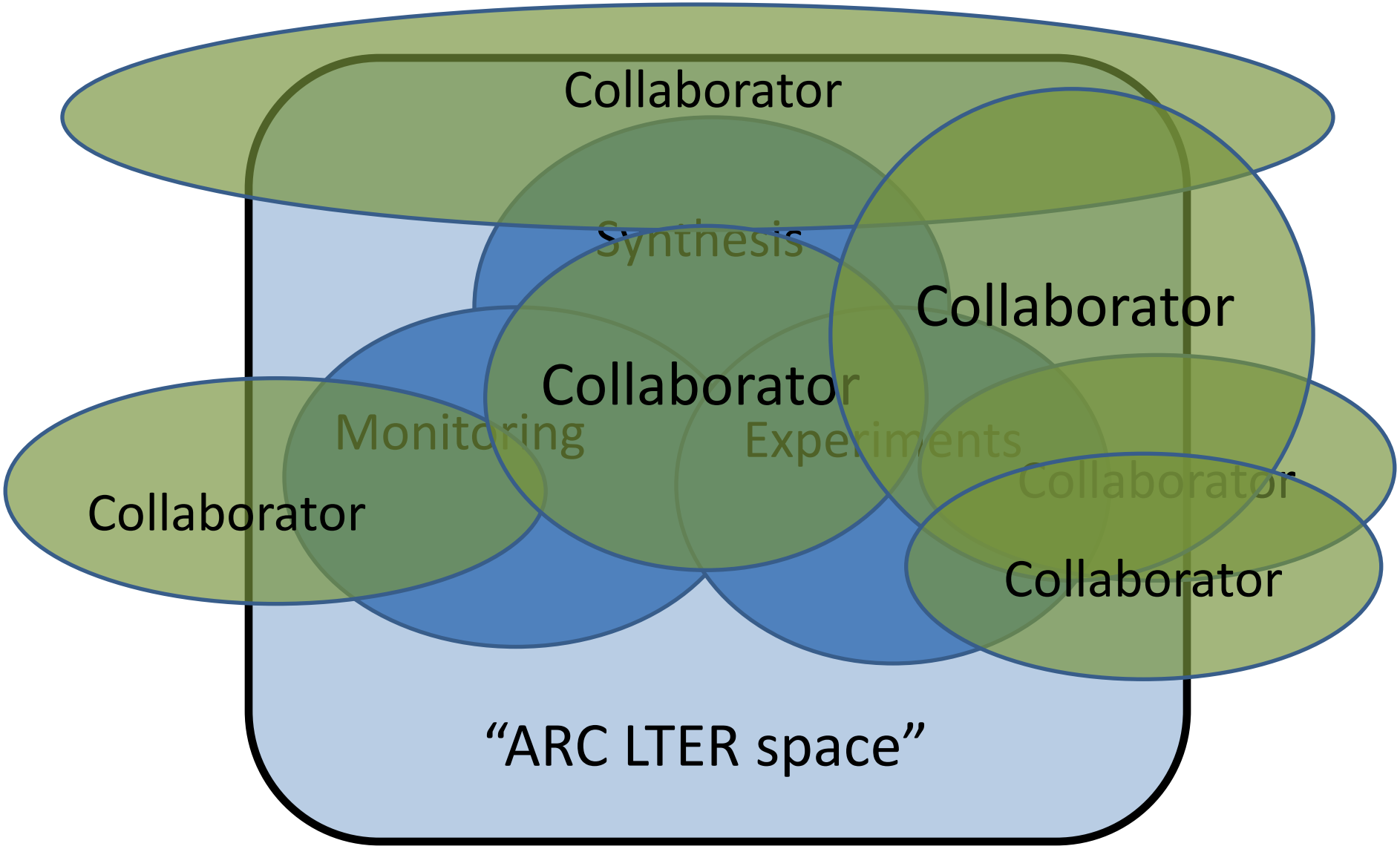
- Uneven understanding of costs & benefits
- Uneven understanding of obligations & responsibilities
- Uneven integration with ARC LTER goals and research design
- Protection of careers of students and younger investigators
- Potential conflicts or redundancy with ARC LTER or other collaborators
- Difficult to synchronize collaborative research with independently funded projects
- Long range planning depends on knowing what collaborators will be doing

Collaboration: needs

- Clear communication with prospective collaborators about expectations of what ARC can do for them
- Clear communication with collaborators about professional credit and authorship
- Clear communication about permitting
- Clear communication about shared logistics
- Thoughtful planning to avoid overlaps and redundancies in research
- Clear understanding of relationships with projects based at TFS but not formally collaborating with ARC (need a Toolik Scientific Steering/Advisory Committee)

Interactions with Networks, TFS

- Avoid competition and overlaps
- Data and information management/synthesis opportunities
- Who does what? (need a Toolik Scientific Steering/Advisory Committee)


Collaborator
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"ARC LTER space"