U.S. DEPARTMENT OF ENERGY | Nuclear Energy

Nuclear Science User Facilities

Fiscal Year 2016 Metrics

Jeff Benson
Program Administrator

FY 2016 NSUF Annual
Program Review
Germantown, MD
November 1-2, 2016

NSUF Nuclear Science User Facilities

INL/MIS-16-38006

NSUF Metrics Overview

Success of the NSUF is evaluated per five metrics:

1. **NSUF Awarded Research**
2. **Partner Utilization**
3. **Publications/Conference Proceedings**
4. **Prominence/Positive Exposure**
5. **NSUF Expand and Diversify Community**

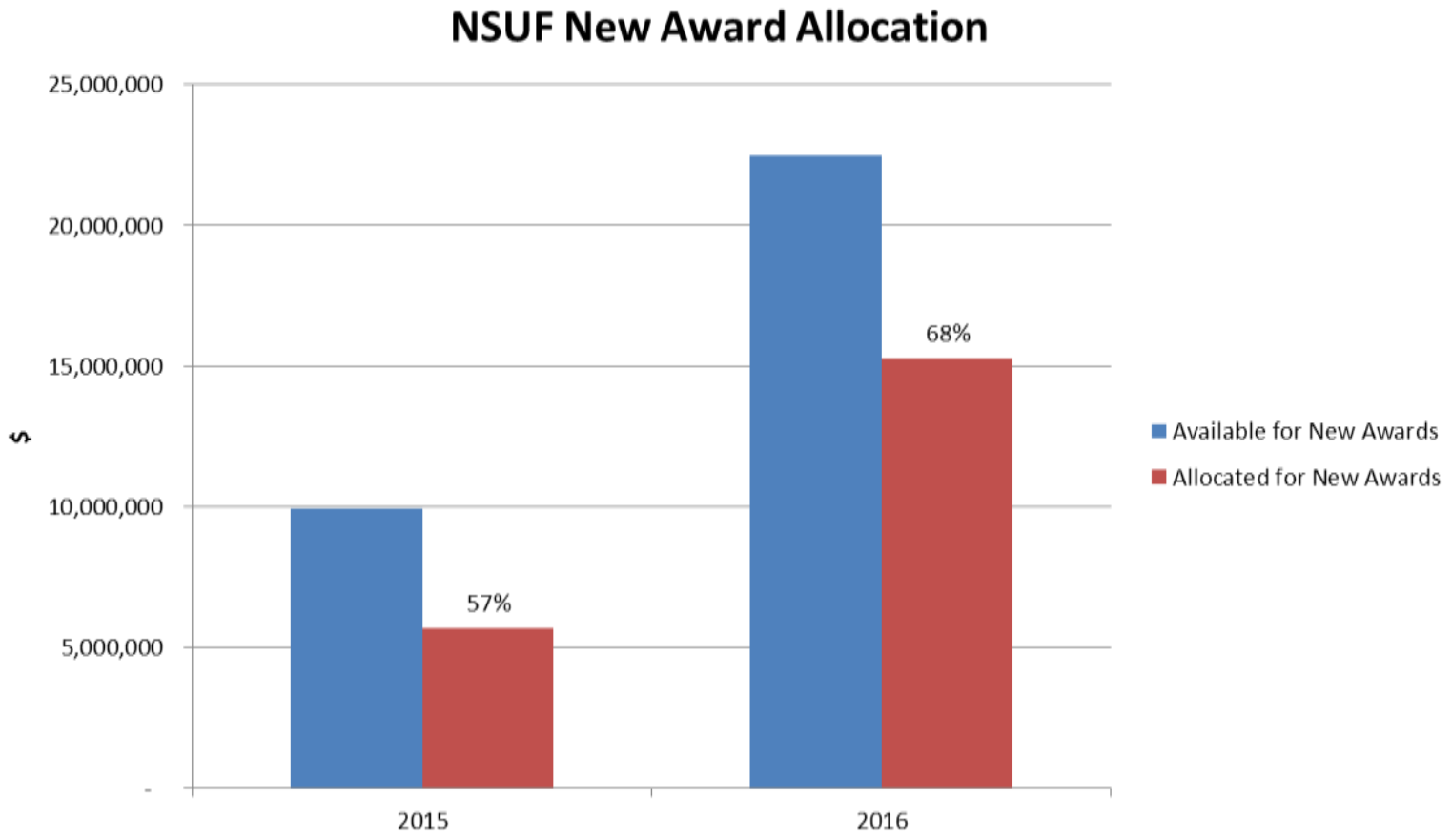
NSUF Awarded Research

OBJECTIVE: Demonstrate efficient use of funding by maximizing funding available for new awards.

- **Performance Metric:** Percentage of annual funding applied to new awards.
- **Performance Goal:** Apply at least 50% of annual funding to new awards, excluding directed activities.

Historic Information

NSUF New Award Allocation



NSUF New Award Allocation

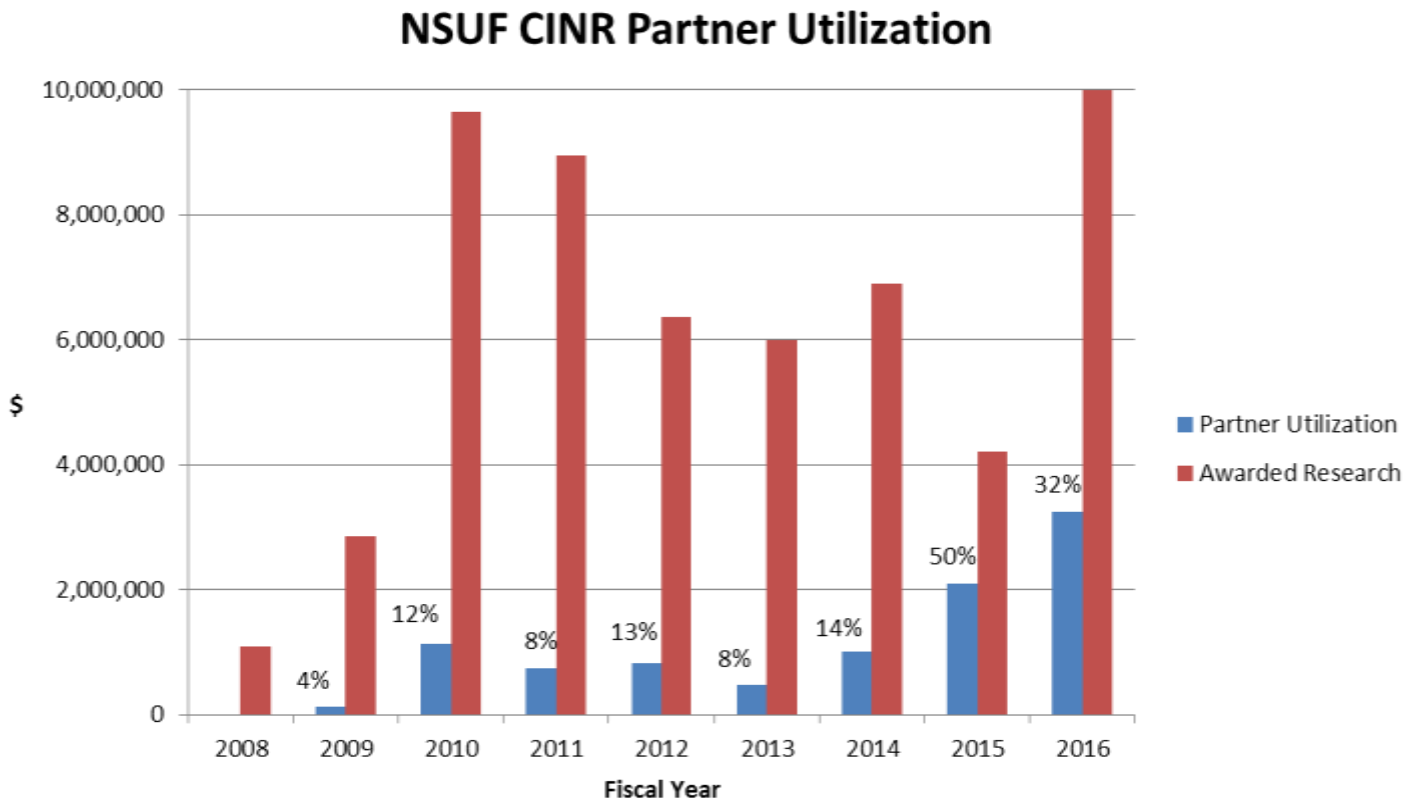
WBS	NEET NSUF Program WBS Element Description FY 2016 $39,682,050 Appropriation Budget Baseline (FY16 September AFP)	WP No.	B&R	FY16 Allotments	Available for New Awards	Allocated for New Awards	FY16 Actual Costs thru September	ANL	INL	LANL	ORNL	PNNL	DOE-HQ	DOE-ID
3.04	NEET National Scientific Users Facility (NSUF)		NT04	39,682,050	22,475,889	15,257,314	16,244,782	905,000	35,029,478	4,633	2,496,597	500,000	271,342	475,000
3.04.01	Management and Integration			828,099	-	-	421,342	-	-	4,633	402,124	-	271,342	150,000
3.04.01.01	DOE-HQ Program Management			678,099	-	-	271,342	-	-	4,633	402,124	-	271,342	-
3.04.01.01	NSUF Program Management Reserves	UF-16HQ010101	NT0401	-	-	-	-	-	-		-	-	-	-
3.04.01.01	NSUF SBIR/STTR Taxes	UF-16HQ010102	NT0401	-	-	-	-	-	-		-	-	-	-
3.04.01.01	NSUF Program Taxes	UF-16HQ010103	NT0401	271,342	-	-	271,342	-	-		-	-	271,342	-
3.04.01.01	FracMan/dfnWorks: From Geological Fracture Characterization to Multiphase Subsurface Flow and Transpo	UF-16LA010104	NT0401	4,633	-	-	-	-	-	4,633	-	-	-	-
3.04.01.01	New High-Strength Ni-based Alloys for High Temperature Service in Liquid Fluoride Salt Environments (OTT	UF-16OR010105	NT0401	97,994	-	-	-	-	-	-	97,994	-	-	-
3.04.01.01	Liquid Salt Environment Creep Testing System Development and Commercialization (OTT)	UF-16OR010106	NT0401	304,130	-	-	-	-	-	-	304,130	-	-	-
3.04.01.02	Program Controls			150,000	-	-	150,000	-	-	-	-	-	-	150,000
3.04.01.02	Program Controls - Management of PICS:NE	UF-16ID010201	NT0401	150,000	-	-	150,000	-	-	-	-	-	-	150,000
3.04.02	NSUF Activities			38,853,951	22,475,889	15,257,314	15,823,440	905,000	35,029,478		2,094,473	500,000	-	325,000
	NSUF Activities Excluding MFC Research Support Facility			29,362,062	22,475,889	15,257,314	15,710,412		25,537,589					
3.04.02.01	Program Office			3,478,583	3,478,583	-	3,715,811	-	3,478,583		-	-	-	-
3.04.02.01	Program Management	UF-16IN020101	NT0402	1,605,523	1,605,523	-	1,535,420	-	1,605,523		-	-	-	-
3.04.02.01	User Development	UF-16IN020102	NT0402	221,003	221,003	-	197,558	-	221,003		-	-	-	-
3.04.02.01	Outreach, Solicitations and Technical Oversight	UF-16IN020103	NT0402	1,652,057	1,652,057	-	1,982,833	-	1,652,057		-	-	-	-
3.04.02.02	Awarded Research			6,453,184	3,962,217	3,070,841	7,663,212	-	6,453,184		-	-	-	-
3.04.02.02	University/Partner Subcontracts	UF-16IN020201	NT0402	698,987	698,987	698,987	771,051	-	698,987		-	-	-	-
3.04.02.02	PIE Management	UF-16IN020202	NT0402	604,152	-	-	683,290	-	604,152		-	-	-	-
3.04.02.02	Pre CINR PIE Projects	UF-16IN020203	NT0402	-	-	-	376,909	-	-		-	-	-	-
3.04.02.02	Rapid Turnaround Experiments / Beamline	UF-16IN020204	NT0402	771,854	771,854	771,854	780,571	-	771,854		-	-	-	-
3.04.02.02	Irradiation Management	UF-16IN020205	NT0402	1,342,017	-	-	1,436,166	-	1,342,017		-	-	-	-
3.04.02.02	Pre CINR Irradiation Projects	UF-16IN020206	NT0402	-	-	-	1,405,229	-	-		-	-	-	-
3.04.02.02	Instrumentation Development (SiC)	UF-16IN020208	NT0402	100,000	100,000	-	178,577	-	100,000		-	-	-	-
3.04.02.02	Sample Library	UF-16IN020209	NT0402	791,376	791,376	-	451,207	-	791,376		-	-	-	-
3.04.02.02	High Performance Computing	UF-16IN020210	NT0402	1,600,000	1,600,000	1,600,000	1,580,212	-	1,600,000		-	-	-	-
3.04.02.02	Management Reserve for Awarded Research	UF-16IN020213	NT0402	544,798	-	-	-	-	544,798		-	-	-	-
3.04.02.03	Cooperative Research			946,310	-	-	1,001,814	-	946,310		-	-	-	-
3.04.02.03	Industry Programs	UF-16IN020301	NT0402	946,310	-		1,001,814	-	946,310		-	-	-	-
3.4.02.04	Capabilities			12,515,505	1,423,616	675,000	912,870	675,000	11,840,505	-	-	-	-	-
3.04.02.04	NSUF Contributions to IVEM at ANL	UF-16AN020402	NT0402	675,000	675,000	675,000	799,842	675,000	-		-	-	-	-
3.04.02.04	NSUF Contributions to TREAT	UF-16IN020401	NT0402	1,600,000	-	-	-	-	1,600,000		-	-	-	-
3.04.02.04	MFC Research Support Facility	UF-16IN020403	NT0402	9,491,889	-	-	113,028	-	9,491,889		-	-	-	
3.04.02.04	Capability Enhancement: RAL Cask Handling / Type B Cask / Tensile Testing	UF-16IN020404	NT0402	748,616	748,616	-	-	-	748,616		-	-	-	-
3.04.02.05	Infrastructure Management			1,785,369	1,011,473	1,011,473	743,027	230,000	773,896		281,473	500,000	-	-
3.04.02.05	FY 2016 ANL Infrastructure Awards	UF-16AN020503	NT0402	230,000	230,000	230,000	-	230,000			-	-	-	-
3.04.02.05	Capabilities Coordination	UF-16IN020501	NT0402	773,896	-	-	743,027	-	773,896		-	-	-	-
3.04.02.05	FY 2016 ORNL Infrastructure Awards	UF-16OR020505	NT0402	281,473	281,473	281,473	-				281,473	-	-	-
3.04.02.05	FY 2016 PNNL Infrastructure Awards	UF-16PN020504	NT0402	500,000	500,000	500,000	-				-	500,000	-	-
3.04.02.06	FY15 New Awards			-	-	-	720,409	-	-		-	-	-	-
3.04.02.06	Boise 8242 Irradiation	UF-16IN020603	NT0402	-	-	-	283,623	-	-		-	-	-	-
3.04.02.06	Boise 8242 PIE	UF-16IN020604	NT0402	-	-	-	-	-	-		-	-	-	-
3.04.02.06	University of Illinois 8305	UF-16IN020605	NT0402	-	-	-	55,444	-	-		-	-	-	-
3.04.02.06	University of Illinois 8312	UF-16IN020606	NT0402	-	-	-	79,277	-	-		-	-	-	-
3.04.02.06	INL MO 8418	UF-16IN020607	NT0402	-	-	-	195,399	-	-		-	-	-	-
3.04.02.06	INL JD 8389	UF-16IN020608	NT0402	-	-	-	106,666	-	-		-	-	-	-
3.04.02.07	FY 2016 New Awards			10,000,000	10,000,000	10,000,000	-	-	8,187,000	-	1,813,000	-	-	-
3.04.02.07	FY 2016 CINR Award Pool	UF-16IN020603	NT0402	8,187,000	8,187,000	8,187,000	-	-	8,187,000				-	-
3.04.02.07	Michigan 10200 PIE (LAMDA)	UF-16OR020702	NT0402	150,000	150,000	150,000	-				150,000			
3.04.02.07	ORNL TG 10764 Irradiation (HFIR)	UF-16OR020703	NT0402	200,000	200,000	200,000	-				200,000			
3.04.02.07	ORNL TG 10764 PIE (LAMDA)	UF-16OR020704	NT0402	285,000	285,000	285,000	-				285,000			
3.04.02.07	ORNL YK 10468 Irradiation (HFIR)	UF-16OR020705	NT0402	363,000	363,000	363,000	-				363,000			
3.04.02.07	ORNL YK 10468 PIE (LAMDA)	UF-16OR020706	NT0402	480,000	480,000	480,000	-				480,000			
3.04.02.07	Vanderbilt 10834 Irradiation (HFIR Gamma)	UF-16OR020707	NT0402	185,000	185,000	185,000	-				185,000			
3.04.02.07	ORNL PE 10737 PIE (LAMDA/CAES)	UF-16OR020708	NT0402	150,000	150,000	150,000	-				150,000			
3.04.02.08	Scientific Expertise			2,100,000	2,100,000	-	-	-	2,100,000		-	-	-	-
3.04.02.08	Scientific Expertise at INL	UF-16IN020801	NT0402	2,100,000	2,100,000		-	-	2,100,000				-	-
3.04.02.09	New Initiatives			1,575,000	500,000	500,000	1,066,297	-	1,250,000	-	-	-	-	325,000
3.04.02.09	Outplant Opportunity Through OECD NEA - DOE-ID	UF-16ID020904	NT0402	325,000	-	-	325,000							325,000
3.04.02.09	Knowledge & Validation Center Planning	UF-16IN020901	NT0402	250,000	-	-	120,595		250,000					
3.04.02.09	GAIN Planning & Management	UF-16IN020902	NT0402	500,000	-	-	500,000		500,000					
3.04.02.09	International Collaboration - INL	UF-16IN020903	NT0402	500,000	500,000	500,000	120,702		500,000					-
3.04.03	Irradiated Materials Characterization Laboratory (IMCL)			-	-	-	-	-	-		-	-	-	-
3.04.03.01	Irradiated Materials Characterization Laboratory (IMCL)			-	-	-	-	-	-		-	-	-	-
3.04.03.01				-	-	-	-	-	-				-	-
	NSUF TOTAL (NT04)		NT04	39,682,050	22,475,889	15,257,314	16,244,782	905,000	35,029,478	4,633	2,496,597	500,000	271,342	475,000

NSUF Partner Utilization

OBJECTIVE: Effectively utilize NSUF capabilities by providing researchers access to a variety of capabilities.

- **Performance Metric:** Percentage of new awards (by funding) executed at partner facilities.
- **Performance Goal:** 20% but subject to change based on final award ranking and preferred capability for awarded scope of work.

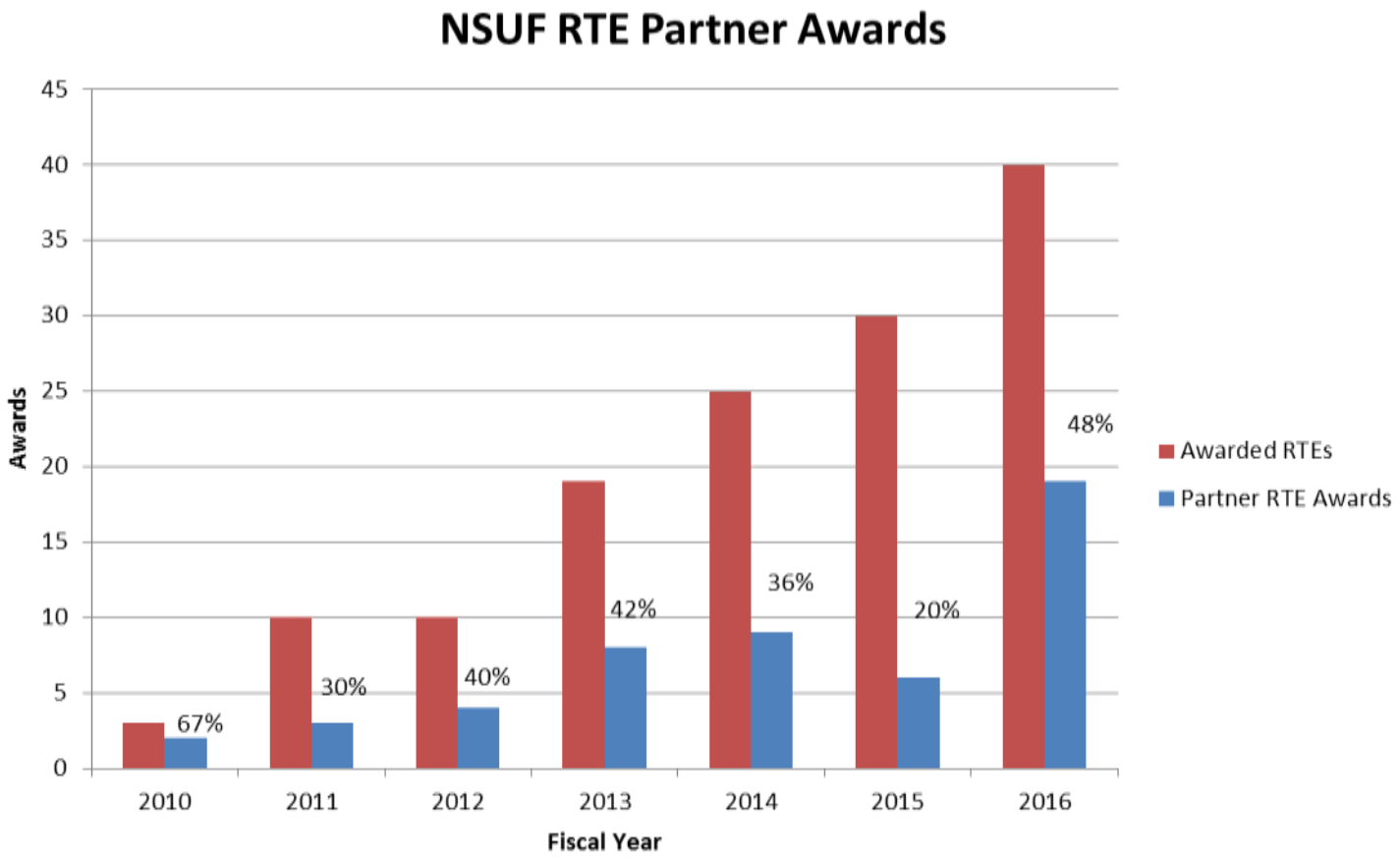
NSUF Partner Utilization



NSUF Partner Utilization

	Partner Utilization								
	2008	2009	2010	2011	2012	2013	2014	2015	2016
Partner Utilization		119,859	1,121,081	745,074	827,883	468,432	999,327	2,101,116	3,248,208
Awarded Research	1,085,730	2,860,790	9,647,551	8,954,578	6,366,246	5,998,187	6,904,147	4,201,907	10,000,000
Partner Utilization $	0%	4%	12%	8%	13%	8%	14%	50%	32%

NSUF Partner Utilization



NSUF Partner Utilization

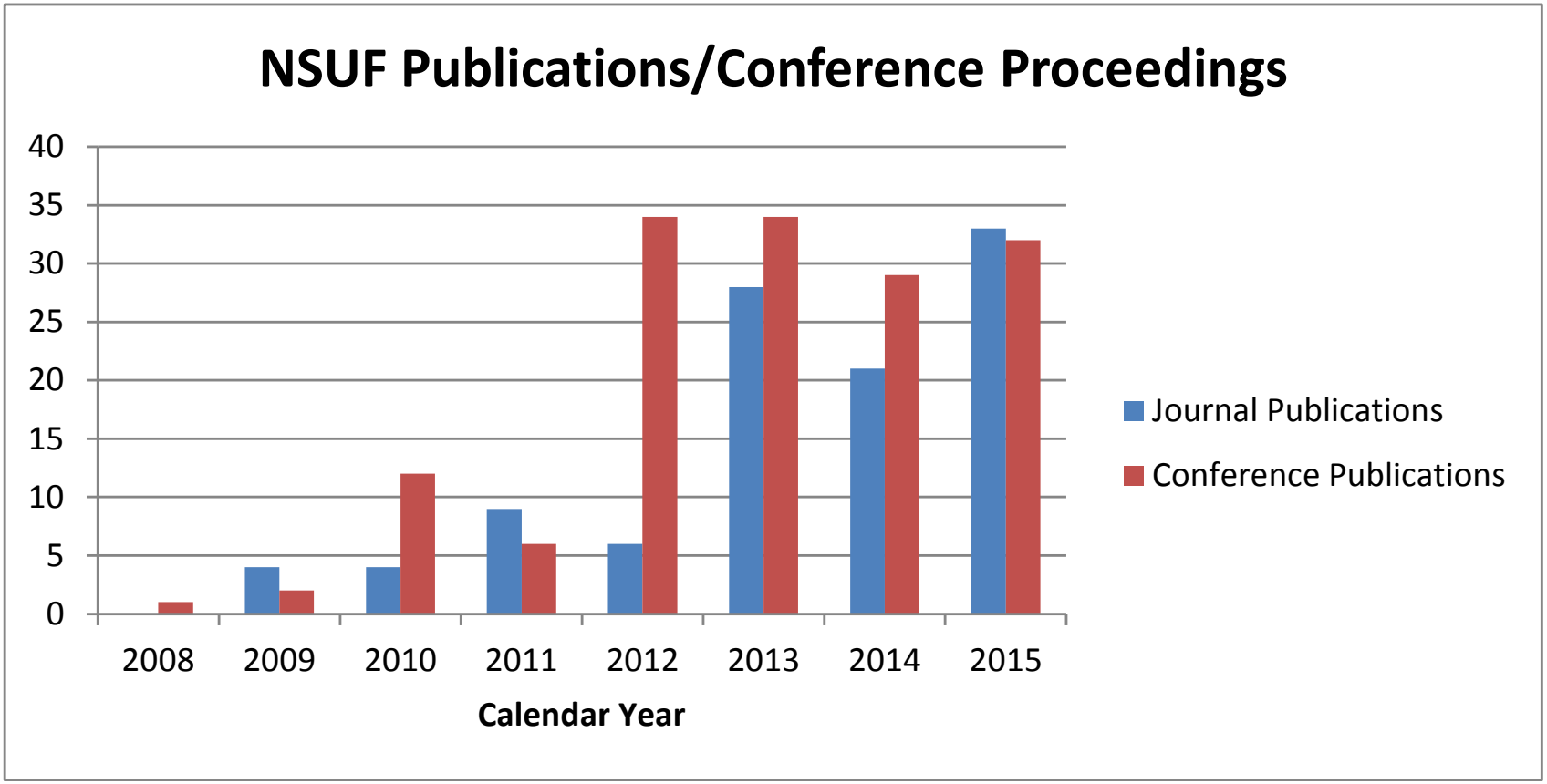
	NSUF Partner RTE Awards							
	2010	2011	2012	2013	2014	2015	2016	Total
Awarded RTEs	3	10	10	19	25	30	40	137
Partner RTE Awards	2	3	4	8	9	6	19	51
Partner RTE Awards %	67%	30%	40%	42%	36%	20%	48%	37%

Publications/Conference Proceedings

OBJECTIVE: Publicize and document research results through publication in high impact factor peer-reviewed journals and conference presentations.

- **Performance Metric:** Number of peer-reviewed publications and conference proceedings per year.
- **Performance Goal:** Minimum of 20 journal publications or conference proceedings per year.

NSUF Prominence/Positive Exposure for NSUF



U.S. DEPARTMENT OF ENERGY
Nuclear Energy

NSUF Prominence/Positive Exposure for NSUF

NSUF Nuclear Science User Facilities

	2008	2009	2010	2011	2012	2013	2014	2015
Journal Publications	0	4	4	9	6	28	21	33
Conference Publications	1	2	12	6	34	34	29	32

NSUF Prominence/Positive Exposure for NSUF

OBJECTIVE: Increase the prominence and positive exposure of NSUF in the research community. This may be a temporary objective until we reach a saturation point when it will become "maintain…"

- **Performance Metric:** Number of invited lectures, plenary lectures, keynote addresses, promotions, awards, PhD dissertations, etc. resulting from NSUF project work or highlighting NSUF opportunities and capabilities.

- **Performance Goal:** 5% increase over previous yearly average.

NSUF Prominence/Positive Exposure for NSUF

Prominence/Positive Exposure for NSUF		
FY 2016	ANS Literary Award "Characterization and Comparative Analysis of Properties of Five Tempered Martensitic Steels and Oside Dispersion Strengthened Ferritic Alloy Irradiated at ~295 C to ~6.5 dpa"	S. Maloy, T. Saleh, R. Odette, O. Anderoglu, T. Romero, G, Odette, T, Yamamoto, S. Li, J. Cole, R. Fielding
	INL Early Career Exceptional Achievement Award	Assel Aitkaliyeva
	ANS Winter Meeting best poster "Dependencies of Alpha' Embrittlement in Neutron-Irradiated Model Fe-Cr-Al Alloys"	Sam Briggs
	ANS Winter Meeting best poster "In Situ TEM Microcompression Pillar Size Effects in Fe-9Cr-Al ODS"	Kayla Yano
	GAIN/UCB Innovation Bootcamp invited talk "Research and Development Capabilities Available Trough the Nuclear Science User Facilities"	Brenden Heidrich
	MeV School Hosted at ORNL "Research and Development Capabilities Available Trough the Nuclear Science User Facilities"	Brenden Heidrich
	Inducted as a Fellow of the Minerals, Metals, and Materials Society (TMS	Robert Odette
	Session Organizer and Chair, "Overview of National Lab Facilities for Radioactive Material," ANS Winter Meeting and Technology Expo, Washington D.C., Nov 8-12, 2015	Rory Kennedy
	Panelist, "Transient Fuel Performance and Testing," ANS Winter Meeting and Technology Expo, Washington D.C., Nov 8-12, 2015	Rory Kennedy
	Invited talk, A Searchable Database of R&D Infrastructure and Capabilities for Nuclear Energy Researchers, Test, Research, and Training Reactor (TRTR), Brewster, MA, Oct 10, 2015	Brenden Heidrich

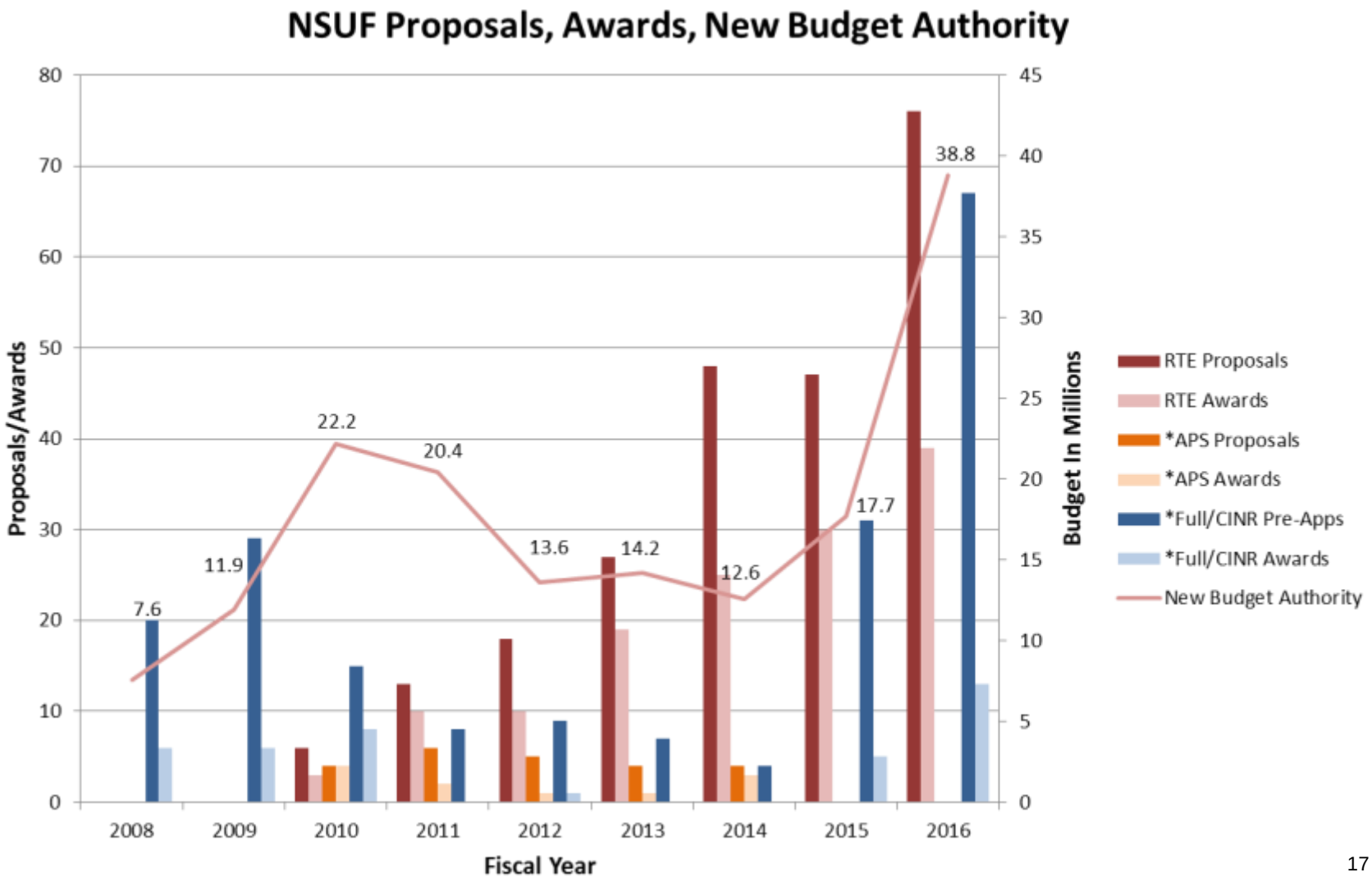
NSUF Expand and Diversify User Community

OBJECTIVE: Expand and diversify the NSUF user community.

- **Performance Metric:** Number of proposals received gauged against: number/year/available funding, project type, number of new PIs, institutions, geographic distribution and minority-serving institutions.

- **Performance Goal:** Analyze data to identify and act upon trends, deficiencies, and exceptionalities. Based on the initial analysis, quantifiable measures will be developed.

NSUF Expand and Diversify User Community

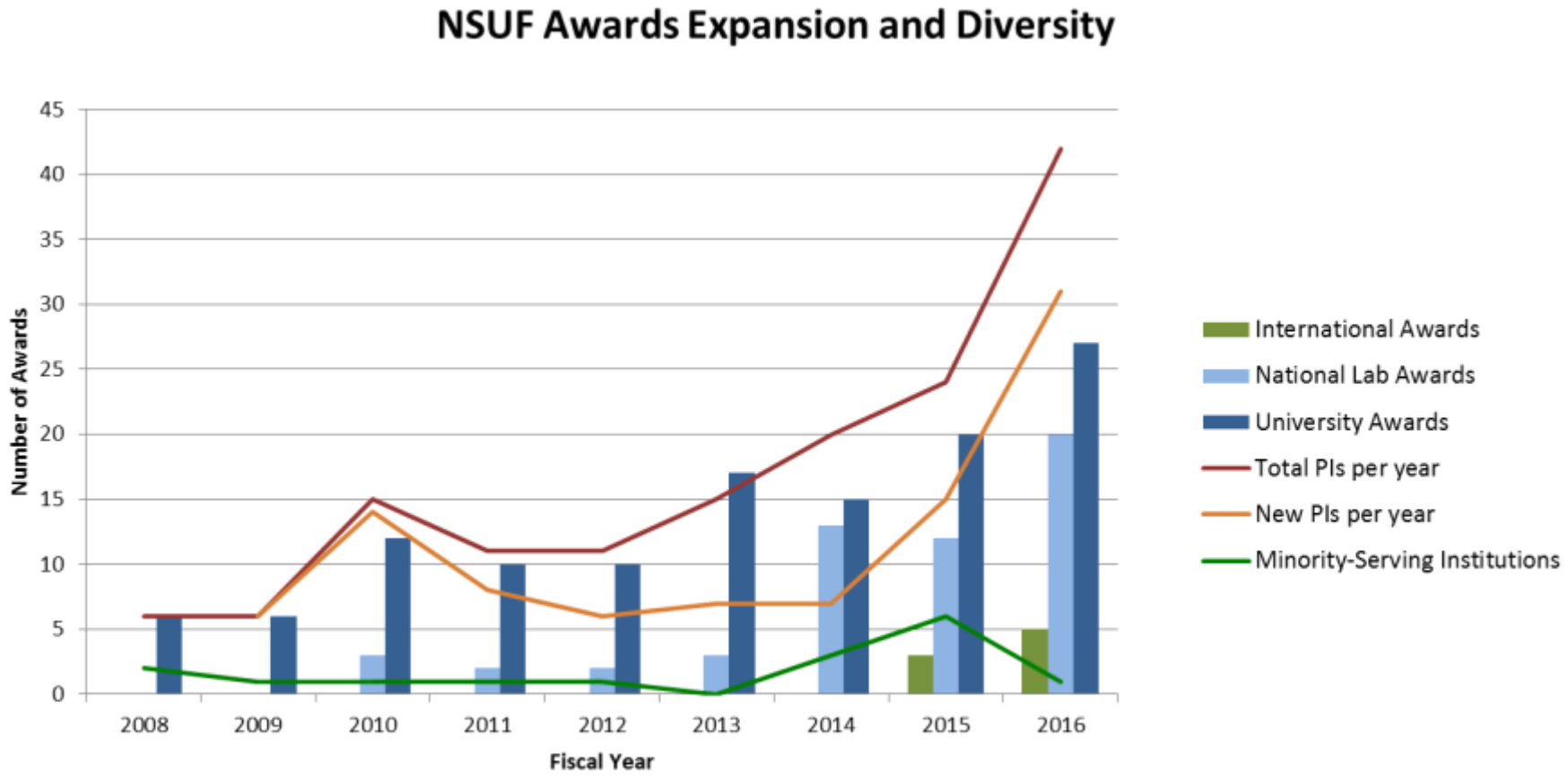


NSUF Expand and Diversify User Community

	2008	2009	2010	2011	2012	2013	2014	2015	2016
RTE Proposals	0	0	6	13	18	27	48	47	76
RTE Awards	0	0	3	10	10	19	25	30	39
*APS Proposals	0	0	4	6	5	4	4		
*APS Awards	0	0	4	2	1	1	3		
*Full/CINR Pre-Apps	20	29	15	8	9	7	4	31	67
*Full/CINR Awards	6	6	8	0	1	0	0	5	13
New Budget Authority	7.6	11.9	22.2	20.4	13.6	14.2	12.6	17.7	38.8

* Full/APS Awards transitioned to CINR Award in 2015

NSUF Expand and Diversify User Community



NSUF Expand and Diversify User Community

	2008	2009	2010	2011	2012	2013	2014	2015	2016
International Awards	0	0	0	0	0	0	0	3	5
National Lab Awards	0	0	3	2	2	3	13	12	20
University Awards	6	6	12	10	10	17	15	20	27
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Total PIs per year	6	6	15	11	11	15	20	24	42
New PIs per year		6	14	8	6	7	7	15	31
Minority-Serving Institutions	2	1	1	1	1	0	3	6	1
MSIs according to US Dept of Edu: University of Illinois, University of California-Santa Barbara									

NSUF

Nuclear Science
User Facilities