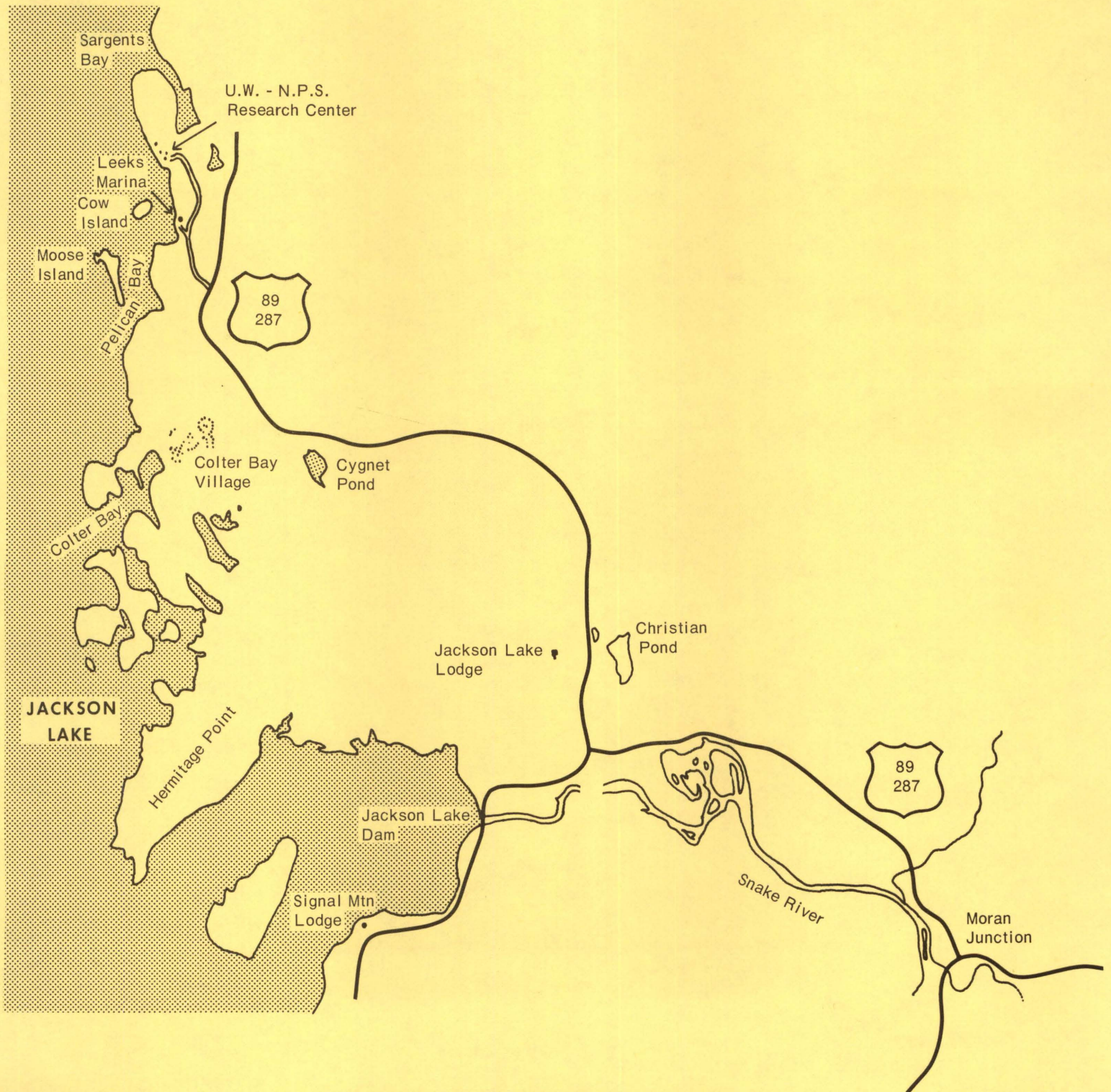




UNIVERSITY OF WYOMING-NATIONAL PARK SERVICE RESEARCH CENTER

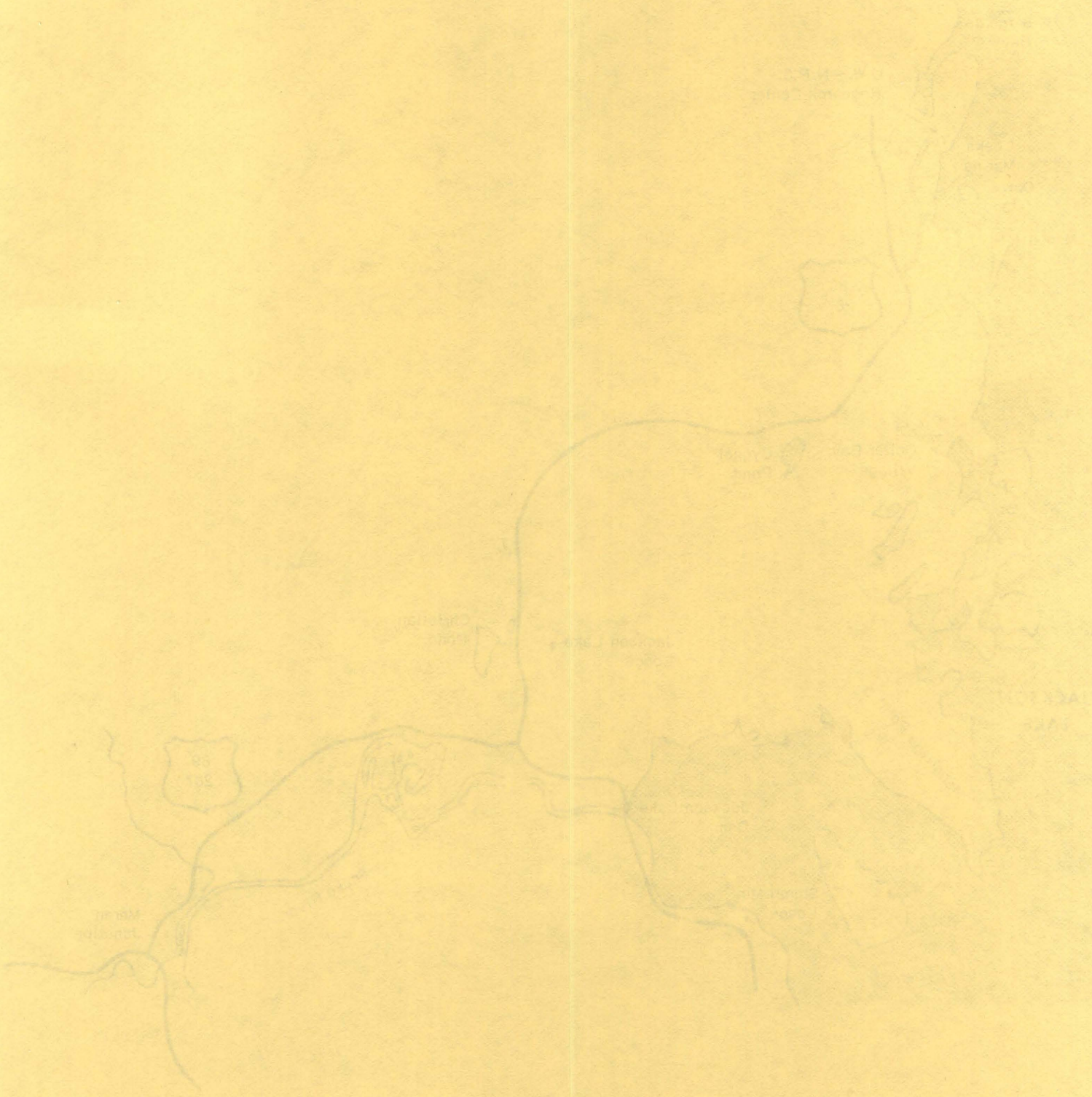
University of Wyoming
National Park Service Research Center
Fourth Annual Report
1980





Box 3166 University Station
Laramie, Wyoming 82071
Telephone: (307) 766-4207 or 4227

Box 170
Moran, Wyoming 83013
Telephone: (307) 543-2463



U.S. GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
SACRAMENTO, CALIF.

WATER RESOURCES DIVISION
SACRAMENTO, CALIF.

PREFACE

The University of Wyoming-National Park Service Research Center sponsors and supports substantial and significant research in the biological, physical and social sciences which can best be done in National Park areas of Wyoming, Montana, North Dakota and South Dakota because of the unique features those areas possess. Administratively, the Research Center is governed by an 8-member Steering Committee composed of 4 University of Wyoming representatives and 4 National Park Service representatives. The Dean of the Arts and Sciences College serves as Committee Chairperson. A faculty member of the University of Wyoming is Director of the Research Center program and is administrator of the Research Center facilities. Also, the Director is an ex-officio member of the Steering Committee. The Research Center physical plant consists of laboratory, library, living, seminar, shop and storage accommodations. Those facilities are normally operational from mid-May to mid-October.

The Director annually calls for research proposals in early September from institutions and individuals requesting such notification. Included with this solicitation are 1) guidelines for proposal preparation, 2) housing and laboratory information, 3) Research Center operational policies, and 4) the Research Center operational calendar. Topics for research include 1) those research problems identified by Park personnel, and 2) research problems suggested by outside individuals on basic or applied proposals they consider to be timely and important and uniquely appropriate to the National Park areas of the four states concerned. While many of the research topics will be directed at solution to management problems and improvement of interpretation information, there will be a concerted effort to encourage and maintain support for a substantial basic research program. Research projects may extend beyond the exact boundaries of the Park areas to work on problems common to the Park lands and adjacent lands. Limited funds are available for support of meritorious research projects. Also, research studies may be funded by other institutions or by individuals.

Investigator(s) submitting proposals to the Research Center should be a faculty member of an academic institution or a full-time member of a research institution. Undergraduate and graduate students cannot be project investigators. Normally all proposals should reach the Director no later than mid-November. The decisions of the Steering Committee concerning approval and where applicable, funding, are released no later than early March.

CONTENTS

	Page
PREFACE	i
STEERING COMMITTEE	iv
DIRECTOR'S REPORT	v
RESEARCH PROJECT REPORTS	1
Bighorn Canyon National Recreation Area	5
Lee, G.	6
Grand Teton National Park	16
Bagdonas, K.	17
Barnosky, A.	24
Barnosky, C.	28
Bergstrom, R.	32
Burnham, W.	38
Diem, K.	40
Eng, R.	44
Evans, H.	48
Gwynne, D.	54
McKnight, K.	58
Parker, F.	62
Pinter, A.	66
Radke, G.	68
Smith, R.	73
Glacier National Park	81
Knapp, A.	82
McClelland, R.	88
Wind Cave National Park	95
Bock, J.	96
Garrett, M.	98
Shown, D.	102
Yellowstone National Park	109
Bartelli, L.	110
Diem, K.	113
Kingston, N.	116
Yavitt, J.	119
LIST OF PUBLICATIONS ON RESEARCH AT UNIVERSITY OF WYOMING-NATIONAL PARK SERVICE RESEARCH CENTER	127

	Page
SUMMARY OF RESEARCH ACTIVITIES WITHIN NATIONAL PARKS SERVICE AREAS COOPERATING WITH THE U.W.-N.P.S. RESEARCH CENTER, 1980	148
NATIONAL PARK SERVICE AREAS COOPERATING WITH U.W.-N.P.S. RESEARCH CENTER, Montana and Wyoming	156
NATIONAL PARK SERVICE AREAS COOPERATING WITH U.W.-N.P.S. RESEARCH CENTER, North Dakota and South Dakota	158

Page

SUMMARY OF RESEARCH ACTIVITIES WITHIN NATIONAL PARKS SERVICE AREAS
COOPERATING WITH THE U.W.-N.P.S. RESEARCH CENTER, 1980 148

NATIONAL PARK SERVICE AREAS COOPERATING WITH THE U.W.-N.P.S.
RESEARCH CENTER, Montana and Wyoming 156

STEERING COMMITTEE

- Mr. Neil J. Reid, Chief Scientist, Rocky Mountain Region, National Park Service;
- Mr. Edwin Rothfuss, Superintendent, Mount Rushmore National Monument;
- Mr. Jack Stark, Superintendent, Grand Teton National Park, National Park Service;
- Mr. John Townsley, Superintendent, Yellowstone National Park, National Park Service;
- Dr. Donald J. Brosz, Department of Agricultural Engineering, University of Wyoming;
- Dr. Raymond Jacquot, Department of Electrical Engineering, University of Wyoming;
- Dr. Jason L. Lillegraven, Department of Geology, University of Wyoming;
- Dr. Joan Wadlow, Dean, Arts and Sciences College, University of Wyoming and Steering Committee Chairperson;
- Dr. Kenneth L. Diem, Ex-officio Member, and Director, UW-NPS Research Center;

DIRECTOR'S REPORT

Forty five proposals were submitted to the Research Center for the 1979-80 season. Twenty five of these proposals submitted by 22 investigators from 14 institutions were approved. Of these 25 proposals, 14 received grant support through the Research Center. A summary of the sources of research funding, recipient institution and location of the research is presented in Table 1. Fourteen of these studies were conducted by researchers residing at the Research Center in Grand Teton National Park.

With respect to the Center's physical plant, the remodeling of the Dark-room, the Library and the Shop Cabin was completed. The installation of the new Johnson Well 500 gallon water pressure-storage tank was also accomplished. A reduction in Park Service funds indefinitely delayed installation of the electric line necessary for the remodeling and development of the lakeside laboratory. University Physical Plant personnel and equipment completed oiling of the last group of the Center's log buildings and sanded and varnished the Berol porch deck.

The aquatic research capabilities of the Center were considerably enhanced with the Center's purchase of a 19' aluminum work boat outfitted with a watertight cabin, full flotation, a cathedral hull for stability and propelled with two 80 hp outboard motors.

The Research Center's Seminar Program was continued with 5 presentations by investigators from 5 institutions. Topics discussed involved reproductive behavior or katydids, as well as, digger wasps; butterfly and moth species, their biology and their distribution in Grand Teton National Park; identification, distribution and characteristics of mushrooms in Grand Teton and Yellowstone National Parks; and biogeographic implications of Miocene mammals from Jackson Hole.

A meeting of scientist or resource manager representatives from each park was held at the Center in September. The U.W.-N.P.S. Research Center 4-state program was reviewed and improvements for the program were developed. The productive character of this meeting suggests that such a meeting should be held every 2 years. Visits to Custer Battlefield National Monument and Devils Tower National Monument provided the Director with first hand information on their specific research and management information needs. During these visits the Research Center program was discussed with particular reference to the ways it may assist their park area. Suggestions were offered concerning the ways they might participate more fully in the program.

Kenneth L. Diem
Director

Table 1. Funding sources, recipient institution and location of research conducted through the U.W.-N.P.S. Research Center, 1980.

Funding Source						
University of Wyoming		National Park Service		Other Grants or Non-Grant Support		
Recip. Instit.	Location of Res.	Recip. Instit.	Location of Res.	Recip. Instit.	Fund Source Location of Res.	
U. Wyo.	Glacier N.P.	Colo. S.U.	Bighorn N.R.A.	Peregrine Found.	Wyo. G. & F., N.	G.T.N.P.
U. Wyo.	G.T.N.P.	Colo. S.U.	G.T.N.P.		P.S. &	
U. Wyo.	G.T.N.P.	U. Mont.	Glacier		Private	
U. Wyo.	Yellowstone N.P.	Mont. S.U.	G.T.N.P. & Yellowstone N.P.	U. New Mex.	N.S.F.	G.T.N.P.
A.R.S. & Brig. Y.U.	G.T.N.P. & Yellowstone N.P.	U. Utah	G.T.N.P.	U. New Orleans Wash.	Private	G.T.N.P.
		U. Colo.	Wind Cave N.P.	U. Wash.	U. Wash. & Priv.	G.T.N.P.
		Iowa S.U.	Wind Cave N.P.	U. Wash.	U. Wash. & Priv.	G.T.N.P.
		Mich. Tech. U.	Wind Cave N.P.	Utah S.U. San. Fran. S.U.	A.R.S.	G.T.N.P.
		Mich. Tech. U.	Yellowstone N.P.	U. Wyo.	Private	G.T.N.P. & Yellowstone N.P.
				U. Wyo.	Priv. & N.P.S.	
				U. Wyo.	Priv. & N.P.S.	G.T.N.P.
				U. Wyo.	U. Wyo.	G.T.N.P.
					Agr. Exp. Sta.	& Yellowstone N.P.

RESEARCH PROJECT REPORTS

The following project reports have been prepared primarily for administrative use. The information reported is of a preliminary nature and may be subject to change as the investigations continue. Consequently, the information presented may not be used without written permission from the author(s).

RESEARCH PROJECT REPORT

The following project reports have been prepared at the University of Wyoming National Park Service Research Center. The information reported is of a preliminary nature and may be subject to change as the investigation continues. Consequently, the information presented may not be used without written permission from the author(s).



BIGHORN CANYON NATIONAL RECREATION AREA

G. FRED LEE

