

U.S. DEPARTMENT OF COMMERCE/ National Oceanic and Atmospheric Administration

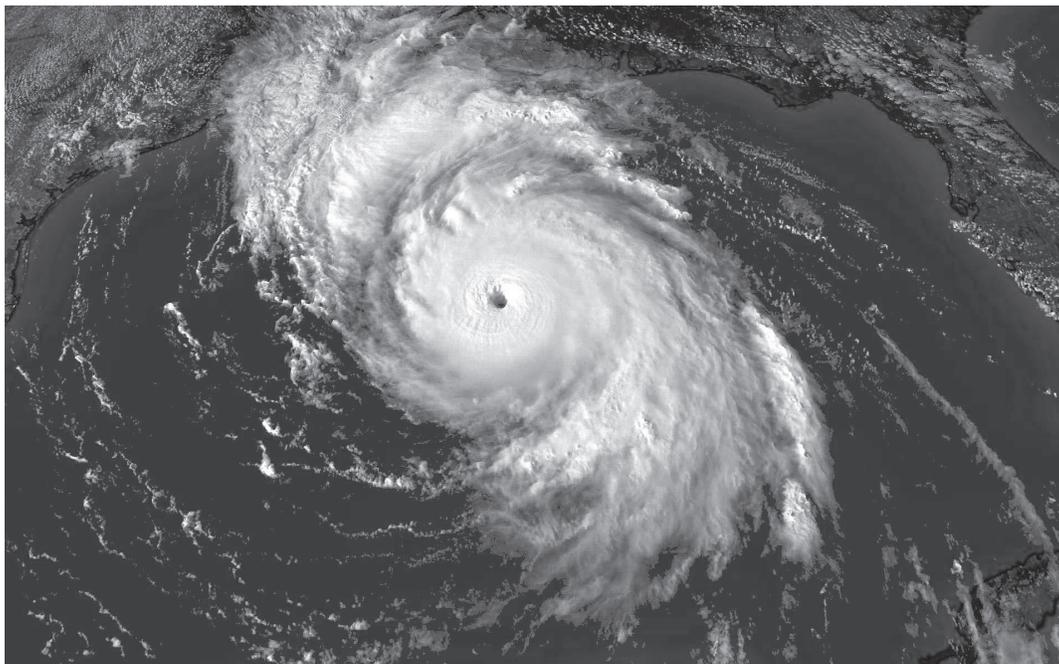
OFCM



OFFICE OF THE FEDERAL COORDINATOR FOR
METEOROLOGICAL SERVICES AND SUPPORTING RESEARCH

National Hurricane Operations Plan

FCM-P12-2003



Washington, DC
May 2003

Hurricane Lili - 02 October 2002

THE FEDERAL COMMITTEE FOR
METEOROLOGICAL SERVICES AND SUPPORTING RESEARCH (FCMSSR)

VADM CONRAD C. LAUTENBACHER, JR., USN (RET.)
Chairman, Department of Commerce

VACANT
Office of Science and Technology Policy

DR. RAYMOND MOTHAS
Department of Agriculture

BRIG GEN JOHN J. KELLY, JR., USAF (RET.)
Department of Commerce

CAPT FRANK GARCIA, USN
Department of Defense

DR. ARISTIDES PATRINOS
Department of Energy

DR. ROBERT M. HIRSCH
Department of the Interior

MR. RALPH BRAIBANTI
Department of State

MR. RANDOLPH LYON
Office of Management and Budget

MR. JAMES H. WASHINGTON
Department of Transportation

MR. ANTHONY LOWE
Federal Emergency Management Agency
Department of Homeland Security

DR. GHASSEM R. ASRAR
National Aeronautics and Space
Administration

DR. MARGARET S. LEINEN
National Science Foundation

MR. PAUL MISENCIK
National Transportation Safety Board

MR. JACK R. STROSNIDER
U.S. Nuclear Regulatory Commission

MR. HENRY L. LONGEST (Acting)
Environmental Protection Agency

MR. SAMUEL P. WILLIAMSON
Federal Coordinator

MR. JAMES B. HARRISON, Executive Secretary
Office of the Federal Coordinator for
Meteorological Services and Supporting Research

THE INTERDEPARTMENTAL COMMITTEE FOR
METEOROLOGICAL SERVICES AND SUPPORTING RESEARCH (ICMSSR)

MR. SAMUEL P. WILLIAMSON, Chairman
Federal Coordinator

MR. THOMAS PUTERBAUGH
Department of Agriculture

MR. JOHN E. JONES, JR.
Department of Commerce

CAPT FRANK GARCIA, USN
Department of Defense

MR. RICKEY PETTY
Department of Energy

MR. LEWIS T. MOORE
Department of the Interior

MR. JEFFREY MACLURE
Department of State

MR. DAVID WHATLEY
Federal Aviation Administration
Department of Transportation

DR. JONATHAN M. BERKSON
United States Coast Guard
Department of Homeland Security

DR. S. T. RAO
Environmental Protection Agency

MR. JOHN GAMBEL
Federal Emergency Management Agency
Department of Homeland Security

DR. RAMESH KAKAR
National Aeronautics and Space
Administration

DR. JARVIS MOYERS
National Science Foundation

MR. DONALD E. EICK
National Transportation Safety Board

MS. LETA A. BROWN
U.S. Nuclear Regulatory Commission

MS. ERIN WUCHTE
Office of Management and Budget

MR. JAMES B. HARRISON, Executive Secretary
Office of the Federal Coordinator for
Meteorological Services and Supporting Research

**FEDERAL COORDINATOR
FOR
METEOROLOGICAL SERVICES AND SUPPORTING RESEARCH**

8455 Colesville Road, Suite 1500
Silver Spring, Maryland 20910

NATIONAL HURRICANE OPERATIONS PLAN

FCM-P12-2003

Washington, D.C.
May 2003

CHANGE AND REVIEW LOG

Use this page to record changes and notices of reviews.

Change Number	Page Numbers	Date Posted	Initial
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

Changes are indicated by a vertical line in the margin next to the change or by shading and strikeouts.

Review Date	Comments	Initial

FOREWORD

The Interdepartmental Hurricane Conference (IHC) is sponsored annually by the Office of the Federal Coordinator for Meteorological Services and Supporting Research (OFCM) to provide a forum for the responsible Federal agencies, together with representatives from the user communities like emergency management, to review the Nation's hurricane forecast and warning program and to make recommendations on how to improve the program in the future. The major objective is to plan and prepare for the upcoming hurricane season. The 57th IHC was held in Miami, Florida, March 10-14, 2003, and the new procedures, procedural changes, and agreements reached at the conference were incorporated into this publication--the 41st edition of the *National Hurricane Operations Plan* (NHOP).

This edition includes a number of revisions and changes. At the 57th IHC, the Working Group for Hurricane and Winter Storms Operations and Research (WG/HWSOR) addressed 10 action items, all of which were closed through incorporation into the NHOP as approved recommendations and/or changes. Additionally, an open action item from the previous IHC was resolved and closed through incorporation into the latest NHOP. The action items will be published in the *Minutes of the 57th Interdepartmental Hurricane Conference*.

The most notable change for the coming season documented in Chapter 4 is the increase in the valid times of tropical cyclone forecasts/advisories out to 120 hours. Also, Chapter 3, *General Operations and Procedures of the National Weather Service Hurricane Centers*, contains information on two new products--the Tropical Cyclone Danger Area Graphic and the Aviation Tropical Cyclone Advisory-- to be issued by TPC/NHC and CPHC. Chapter 6, *Satellite Reconnaissance*, was substantially updated, and procedures in Chapter 7, *Surface Radar Reporting*, were changed to provide the *WSR-88D Operations Plan for Tropical Cyclone Events* on the OFCM web site in conjunction with the NHOP.

Eight named tropical cyclones formed in September, making it the busiest calendar month on record in the Atlantic, and the first 2002 Atlantic hurricane did not develop until September 11th, the latest date for such an occurrence since the beginning of the reconnaissance aircraft era in 1944. Eight tropical cyclones made direct hits on the U.S., and Lili was the first U.S. hurricane landfall since Irene in 1999. Overall, tropical cyclones caused 18 deaths in the U.S. and about \$1.2 billion damage, mostly from Lili and Isidore. Our multiagency tropical cyclone warning support system was once again put to the test, and it responded superbly-- a tribute to the professionalism, dedication, and cooperation of the civilian and military agencies involved.

Samuel P. Williamson
Federal Coordinator for Meteorological
Services and Supporting Research

NATIONAL HURRICANE OPERATIONS PLAN

TABLE OF CONTENTS

	Page
CHANGE AND REVIEW LOG	ii
FOREWORD	iii
TABLE OF CONTENTS	v
CHAPTER 1 INTRODUCTION	1-1
1.1. General	1-1
1.2. Scope	1-1
CHAPTER 2 RESPONSIBILITIES OF COOPERATING FEDERAL AGENCIES ..	2-1
2.1. General	2-1
2.2. DOC Responsibilities	2-1
2.3. DOD Responsibilities	2-4
2.4. DOT/DHS Responsibilities	2-5
2.5. Annual Liaison with Other Nations	2-5
2.6. Air Traffic Control/Flight Operations Coordination	2-6
CHAPTER 3 GENERAL OPERATIONS AND PROCEDURES OF THE NATIONAL WEATHER SERVICE HURRICANE CENTERS	3-1
3.1. General	3-1
3.2. Products	3-1
3.3. Designation of Tropical and Subtropical Cyclones	3-5
3.4. Transfer of Warning Responsibility	3-7
3.5. Alternate Warning Responsibilities	3-12
3.6. Abbreviated Communications Headings	3-12
3.7. Hurricane Liaison Team (HLT)	3-14
CHAPTER 4 NATIONAL WEATHER SERVICE PRODUCTS FOR THE DEPARTMENT OF DEFENSE	4-1
4.1. General	4-1
4.2. Observations	4-1
4.3. Tropical Cyclone Forecast/Advisories	4-1
CHAPTER 5 AIRCRAFT RECONNAISSANCE	5-1
5.1. General	5-1
5.2. Responsibilities	5-1
5.3. Control of Aircraft	5-3
5.4. Reconnaissance Requirements	5-3
5.5. Reconnaissance Planning and Flight Notification	5-6
5.6. Reconnaissance Effectiveness Criteria	5-19

5.7.	Aerial Reconnaissance Weather Encoding, Reporting, and Coordination	5-20
5.8.	Operational Flight Patterns	5-23
5.9.	Aircraft Reconnaissance Communications	5-26
CHAPTER 6	SATELLITE SURVEILLANCE OF TROPICAL AND SUBTROPICAL CYCLONES	6-1
6.1.	Satellites	6-1
6.2.	National Weather Service (NWS) Support	6-5
6.3.	NESDIS Satellite Analysis Branch (SAB)	6-5
6.4.	Air Force Support and the Defense Meteorological Satellite Program (DMSP)	6-6
6.5.	Satellites and Satellite Data Availability for the Current Hurricane Season	6-9
6.6.	Current Intensity and Tropical Classification Number	6-12
CHAPTER 7	SURFACE RADAR REPORTING	7-1
7.1.	General	7-1
7.2.	The WSR-88D	7-1
7.3.	Procedures	7-1
CHAPTER 8	NATIONAL DATA BUOY CAPABILITIES AND REQUIREMENTS	8-1
8.1.	General	8-1
8.2.	Requests for Drifting Buoy Deployment	8-2
8.3.	Communications	8-2
CHAPTER 9	MARINE WEATHER BROADCASTS	9-1
9.1.	General	9-1
9.2.	Global Maritime Distress and Safety System (GMDSS)	9-1
9.3.	Coastal Maritime Safety Broadcasts	9-2
9.4.	High Seas Broadcasts	9-2
9.5.	Additional Information	9-3
CHAPTER 10	PUBLICITY	10-1
10.1.	News Media Releases	10-1
10.2.	Distribution	10-1

APPENDIX A	LOCAL NATIONAL WEATHER SERVICE (NWS) OFFICE PRODUCTS	A-1
APPENDIX B	DEFINING POINTS FOR TROPICAL CYCLONE WATCHES/ WARNINGS	B-1
APPENDIX C	JOINT TYPHOON WARNING CENTER (JTWC) BULLETINS	C-1
APPENDIX D	FORMAT FOR NHOP/NWSOP FLIGHT INFORMATION FOR INTERNATIONAL AND DOMESTIC NOTAM ISSUANCE	D-1
APPENDIX E	SAFFIR-SIMPSON HURRICANE SCALE	E-1
APPENDIX F	OFFICIAL INTERAGENCY AGREEMENTS	F-1
APPENDIX G	RECCO, HDOB, MINOB, AND TEMP DROP CODES, TABLES, AND REGULATIONS	G-1
APPENDIX H	WSR-88D OPERATIONS PLAN FOR TROPICAL CYCLONE EVENTS	H-1
APPENDIX I	TELEPHONE AND TELETYPE LISTING	I-1
APPENDIX J	PHONETIC PRONUNCIATION LISTING	J-1
APPENDIX K	ACRONYMS/ABBREVIATIONS	K-1
APPENDIX L	GLOSSARY	L-1
APPENDIX M	DISTRIBUTION	M-1

LIST OF FIGURES

Figure		Page
1-1.	Tropical cyclone forecast centers' areas of responsibility	1-2
2-1.	Typhoon Pongsona, December 9, 2002	2-3
3-1.	Aviation Tropical Cyclone Advisory Format	3-5
4-1.	Tropical cyclone forecast/advisory format	4-3
4-2.	Tropical cyclone public advisory format	4-4
5-1.	WC-130 Weather Reconnaissance Aircraft	5-2
5-2.	G-IV Weather Surveillance Aircraft	5-2
5-3.	NOAA P-3 Weather Surveillance Aircraft	5-3
5-4.	Vortex data message worksheet	5-8
5-5.	Supplementary vortex data message	5-9
5-6.	Example Vortex Data Messages (VDM) and Supplementary Vortex Data Messages (SVDM) for the WC-130H and WC-130J	5-13
5-7.	NHOP coordinated request for aircraft reconnaissance	5-14
5-8.	Tropical cyclone plan of the day format	5-15
5-9.	Mission evaluation form	5-21
5-10.	Flight pattern ALPHA	5-23
5-11.	Suggested patterns for investigative missions	5-24
5-12.	Schematic of aircraft-to-satellite data link for NOAA P-3 aircraft	5-27
5-13.	Schematic of aircraft-to-satellite data link for AFRC WC-130 aircraft	5-28
6-1.	The GOES satellite system	6-3
6-2.	Center fix data form and message format (satellite)	6-8
8-1.	NDBC moored buoy locations in the Atlantic Ocean, the Gulf of Mexico, and the Great Lakes	8-5
8-2.	NDBC moored buoys in the Pacific Ocean	8-6
8-3.	C-MAN stations in the coastal U.S.	8-7
8-4.	NDBC planned and current Gulf of Mexico moored buoy network	8-8
8-5.	Drifting data buoy deployment patterns	8-9
A-1.	Hurricane Local Statement Format	A-4
B-1.	Tropical Cyclone Break Points for the Northeast	B-3
B-2.	Tropical Cyclone Break Points for the Southeast	B-3
B-3.	Tropical Cyclone Break Points for the Gulf of Mexico	B-4
G-1.	Reconnaissance code recording form	G-2
G-2.	HDOB Description and Sample Messages	G-6
G-3.	MinOb Description and Sample Message	G-8
G-4.	Example TEMP DROP Message for Tropical Cyclones	G-15

LIST OF TABLES

Table		Page
3-1.	Atlantic Tropical Cyclone Names	3-8
3-2.	Eastern Pacific Tropical Cyclone Names	3-9
3-3.	Central Pacific Tropical Cyclone Names	3-10
3-4.	International Tropical Cyclone Names for the Western Pacific and South China Sea	3-11
5-1.	Requirement for aircraft reconnaissance data	5-6
5-2.	Vortex data message entry explanation	5-10
6-1.	Communications headings for satellite tropical weather discussion summaries	6-7
6-2.	Satellite and satellite data availability for the current hurricane season	6-9
6-3.	The empirical relationship between the C.I. number and the maximum wind speed and the relationship between the T-number and the minimum sea-level pressure	6-12
7-1.	Participating radar stations	7-2
8-1.	Moored buoy locations and configurations	8-3
8-2.	C-MAN sites	8-4
8-3.	Code forms for moored data buoys, C-MAN stations, and drifting buoys	8-10
G-1.	Reconnaissance code tables	G-3
G-2.	Reconnaissance code regulations	G-5
G-3.	HDOB Message Format	G-7
G-4.	NOAA MinOb Message Format	G-9
G-5.	TEMP DROP code	G-10