WORLD METEOROLOGICAL ORGANIZATION

PROGRAMME ON PHYSICS AND CHEMISTRY OF CLOUDS AND WEATHER MODIFICATION RESEARCH

WMP

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No. 38

REGISTER OF NATIONAL WEATHER MODIFICATION PROJECTS

2000

WMO/TD - No. 1094

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I. INTRODUCTION

As part of the activities which WMO carries out in its Programme on the Physics and Chemistry of Clouds and Weather Modification Research, a Register of National Weather Modification Projects is kept. The Register has existed since 1975 when the Seventh World Meteorological Congress agreed that an inventory of activities within Member countries related to weather modification should be initiated and maintained. Periodic reviews have all recommended that the Register be continued.

This present Register is the twenty third such publication issued. It is based on information obtained from Member countries on experiments and operations sponsored by government agencies or private concerns that took place during 2000.

To assist the reader in understanding the content of each of the 12 columns used in the tabular presentation found within, detailed explanations are provided in Section II. These columns contain information that was obtained from WMO Member countries in response to questionnaires sent to them in April 2001.

The names of Member countries who provided the information reported in this Register are listed in Sections III. Section VII provides summaries of completed projects and Section VIII indicates which countries reported that no weather modification activities had taken place in 2000.

Requests for further information concerning the projects reported may be addressed to the reporting agency for each country which is indicated in Section V. The WMO Secretariat would be pleased to assist if requested.

II. DETAILED EXPLANATION OF INFORMATION COLUMNS

Column 1: WMO Register No.

This consists of country indicator letters (according to the ISO Standard 3166-1974) and a serial number for each project.

Column 2: Objective of project, type of organization carrying it out

Dev.	=	Development	PE	=	Precipitation Enhancement
Ext.	=	Extend wet period	(E)	=	Emergency
Fog	=	Fog dissipation	(R)	=	Routine
Hail	=	Hail suppression	PR	=	Precipitation Redistribution
Inc.	=	Increase during wet period	Res.	=	Research
Op.	=	Operational			

Column 3: Approximate size of project area

Given in square kilometres for target and control (if any) areas.

Column 4: Name of project

Reference numbers are also quoted when supplied.

Column 5: Location of project area

In some cases where co-ordinates of several points delineating the area were given, these have been replaced by a single point at approximately the centre of the area. Towns and islands may be denoted by name; A/P = Airport.

Column 6: Year project commenced and continuity

Date	--	year project started
Every year	--	indicates project has operated every year
Interrupted	--	indicates project has not operated every year
No	--	indicates project will not be continued
Yes	--	indicates project will be continued
(?)	--	indicates project status is unknown

Column 7: Nature of organization sponsoring project

Indicated by abbreviations as follows:

Agr.	=	Agricultural	Muni.	=	Municipal
Def.	=	Defense	(P)	=	Private
Enr.	=	Energy	Rec.	=	Recreation
For.	=	Forestry	Res.	=	Research
(G)	=	Government	Trans.	=	Transportation
Hyd.	=	Hydrological	Wea. Serv.	=	Meteorological

Column 8: Apparatus, seeding location

Abbreviations are as follows:

Air	=	Airborne	G/B	=	Ground-Based
A/C	=	Aircraft	Temp.	=	Temperature

Column 9: Agents, dispersal rates

Self-explanatory.

Column 10: Characteristics of clouds treated, seeding criteria

LWC	=	Liquid Water content	Temp.	=	Temperature
Obs.	=	Observations			

Column 11: Active period during reporting year

Months of activity are inclusive.

Jan	=	January	July	=	July
Feb	=	February	Aug	=	August
Mar	=	March	Sept	=	September
Apr	=	April	Oct	=	October
May	=	May	Nov	=	November
June	=	June	Dec	=	December

Column 12: Documentation

"EIS" indicates that an environmental impact study has been made; "C/B" indicates that a costs and benefits analysis has been made.

III. MEMBER COUNTRIES REPORTING 2000 PROJECTS

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IV. REGISTER OF 2000 REPORTED PROJECTS

AUSTRALIA											
AU-1	Op. PE Inc. Precipitation Redistribution	Target area 6000 km^2	Hydro-Tasmania Production cloud seeding operation 2000	Central plateau Tasmania	1998 Every year Yes	Energy (G)	1A/C with acetone burner seeding in-cloud at –10°C level and cloud LWC> 0.1 gm^{-3}	AgI at 320 g/hr 33 kg for the year	Orographic and layer clouds with bases colder than 10°C and tops colder than 0°C but warmer than -20°C. Seeding criteria cloud top temp. LWC at –10°C level, depth of cloud	April – Nov 244 days	Evaluation based on historical records EIS-YES C/B-YES
AUSTRIA											
AUS-1	Op. Hail	1,800 km^2	Hail test program – STYRIA	46°50'N - 15°45'E	1985 Every year Yes	Agr (P)	3 A/C with acetone burners and pyrotechnic flares for seeding cloud bases	AgI 11/hour Annual consumption 125 kg	Convective clouds, bases colder than 10°C and tops colder than –20°C. Seeding criteria subjective decision based on regional weather forecasts and C-band radar data	April - September 34 days	Evaluation based on historical records, crop damage and hail pad data. Report available EIS-No C/B-No
AUS-2	Op. Hail	500 km^2	Hail test programme Lower Austria (HTP-NOE)	48°25'N 15°35'E Lower Austria	1981 Every year Yes	Agr. (P)	3 A/C with acetone burners and pyrotechnic flares for seeding cloud bases	AgI, 11/hour annual consumption 50 kg	Convective clouds with bases colder than 10°C and tops colder than –20°C. Seeding criteria: subjective decision based on regional weather forecasts and C-band radar data	May-August 19 days	Evaluation based on historical records, crop damage and hail pad data, report available EIS-No C/B No
BULGARIA											
BG-1	Op. Res. Hail	15,255 km^2	Bulgarian Hail Suppression Project	NW Bulgaria 43°20' –44° 0'N 22°30'–24°40' E South Bulgaria 42° 0'–42°35'N 24°00' –26°30'E	1969 Interrupted Yes	Agr. (G)	Rocket-based pyrotechnic flares for in-cloud seeding at temperatures -5 to –10° C	AgI, 40g/rocket Annual consumption 91 kg	Convective clouds, bases warmer than 10°C, tops colder than -20°. Seeding criteria based on radar echo, cloud heights or cloud top temperature and reflectivity	May - Sept. 29 days	Evaluation based on comparison with historical records, crop damage. Evaluation document done but not available to WMO EIS – No. C/B –Yes.

IV. REGISTER OF 2000 REPORTED PROJECTS

CANADA											
CAN-1	Op. Hail	26,400 km^2	Alberta Hail Suppression Project	Province of Alberta (Lacombe to High River)	1996 Every Year Yes	Ins. (P)	Seeding cloud-base and cloud-top at temp. –5 to –10^0 C with acetone burners and pyrotechnic flares from 3 A/C	AgI, Flares: one 20g flare every 5 sec. In cloud top and 150g flare / run at cloud base. Annual consumption 184 . 3 kg and 20.4 kg AgI acetone solution	Convective clouds bases colder than 10°C, tops colder than -20^{0}C. Seeding criteria : radar-defined cells with max. reflectivity of no less than 35dBz above -5°C level.	1 June- 15 Sept, 46 days	Evaluation based on comparison with historical records, no document planned EIS-No C/B - No
CHILE											
CHI-1	PE Op (E) (R)	Target area 100 km^2 control area 30 km^2	Precipitation Enhancement Programme Cachapoal River basin	Cachapoal River Basin 34°S, 71°W	2000	Agr (G)	Ground based seeding from 8 acetone burners	AgI. Total consumption 4.702 kg	All cloud types with bases colder than 10°C and tops colder than –20°C . Seeding criteria based on synoptic systems (e.g. cold fronts in area) and precipitation observed in Basin	Apr-Sept. 12 days	Evaluation based on historical precipitation behaviour inside and beyond the Basin and the 2000 precipitation amounts
CHINA											
CN-1	Op. PE (E) Hail	Control area 7160 km^2		Heilongjiang Province	1985 Every year Yes	Wea. Ser. (G)	In-cloud seeding growing cells at temperatures of -4° to -10°C using artillery shells and 1 A/C	AgI,. Total consumption 58.5 kg	Convective and layer clouds with tops colder than 0°C and tops warmer than –20°C. Seeding criteria based on type of synoptic system and radar data and climatological needs.	May - Sept. 74 days with A/C seeding; 148 days with artillery	Evaluation based on randomised experiment. No document planned. EIS - No C/B – No
CN-2	Op. Res PE (E) (R) Inc. PR Hail Fog	Target: 6,800 km^2 Control: 2,000 km^2	Precipitation Enhancement Hail suppression	Catchments of two reservoirs in Beijing province 3 countries in Beijing	1990 Every year Yes	Agr. (G)	In-cloud seeding with one A/C using liquid nitrogen generators. Rockets and artillery shells used for hail suppression.	Liquid nitrogen, 80 kg/hour Total consumption 1500 kg	Stratiform clouds with bases colder than 10°C, top temperature being between 0° and –20°C. Seeding criteria presence of stratiform clouds.	January – December for precipitation enhancement May – October for hail suppression	Evaluation based on randomization and crop damage No document planned. EIS - Yes C/B – No

IV. REGISTER OF 2000 REPORTED PROJECTS

CN-3	Op. PE (E) (R) Hail	Target: 150,000 km^2	Project of Precipitation Enhancement and Hail Suppression of Shandong Province	Shandong Province	1988 Every year Yes	Wea. Ser. (G)	In-cloud seeding at -5^0 to -15^0 C with 2^0 A/C using acetone burners. Rockets and artillery shells used for hail suppression.	AgI, 320 g/hr Total consumption 15 kg	Stratiform clouds with bases colder than 10°C, top temp. being between 0^0 and –20°C. Seeding criteria : base lower than 2 km, cloud depth in excess of 2 km. With abundant supercooled water.	March – October 245 days	Evaluation based on crop damage and comparison with floated control area. No document planned EIS - No C/B – Yes
CN-4	Op. PE (R) Hail	Target: 12000 km^2	Shanxi province weather modification	Shanxi Province	1989 Every year Yes	Agr. (G) Weather Service (G)	In-cloud seeding with one A/C, rockets and artillery shells at temp. between 0 and –20°C.	AgI, 0.3-0.4 kg/hour. Total annual consumption 80 kg	Convective and stratiform clouds with bases warmer than 10°C and top temp. between 0 and –20°C.	All year	Evaluation based on crop damage. Comparison with historical records and hail pad data. Document planned. EIS – No C/B – Yes
CN-5	Op. PE Inc. Hail	Target: $1.2x10^4$ km^2	Precipitation Enhancement and Hail Suppression Operation	Hubei Province	1958 Every year Yes	Agr. (G)	In-cloud seeding with pyrotechnic flares on rockets and artillery at temp lower than –4°C at 4-8 km	AgI, Total annual consumption 34 kg	Convective clouds with bases warmer than 10°C and top temp colder than –20°C. Seeding criteria: Radar reflectivity greater than 35 dbz.	May – October 184 days	Evaluation based on crop damage. No report available EIS- Yes C/B- Yes

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CN-6	Op. PE (R) Hail	Target: 170,000 km^2	Weather Modification in Guangxi	Guangxi Province 22-26°N 106-112°E	1990 Every year Yes	Agr. (G)	Cloud top and in-cloud seeding with one A/C, rockets and artillery shells at temp. below –2°C.	AgI, 2 g/km . Total annual consumption 20 kg	Convective clouds with bases colder than 10°C and top temp between 0 and –20°C. Seeding criteria cloud top temp. below –2°C and cloud thickness >2 km. Radar reflectivity in excess of 35 dbz.	Feb – May and July – December 50 days	Evaluation based on crop damage and hail pad data. Document available EIS-Yes C/B-Yes
CN-7	Op. PE (E) (R) Hail	Target: Precipitation Enhance-ment 10,000 km^2 Hail – 11,000 km^2	Project of Precipitation Enhancement and Hail Suppression	32-39°N 106 –111° E Shaanxi Province	1988 Every year Yes	Provincial Govern-ment	In-cloud seeding with one A/C, rockets and artillery shells using acetone burners and pyrotechnic flares.	AgI. 1.75 kg/hour during precipitation enhancement and 200 g per cloud during hail suppression. Total annual consumption 85kg.	Convective and stratiform clouds with bases warmer than 10°C and top temp. between 0 and -20^0 C. Seeding criteria: Radar reflectivity in excess of 15 dBz, cloud base below 1000m, cloud top above 5km	For precipitation enhancement March-June and Sept. Oct. Total 17 days. For hail suppression – Total 30 days during May-Oct.	Evaluation based on crop damage and hail pad data. No document available EIS-No C/B-Yes
CN-8	Op. PE (E) (R) Inc. Hail	Target: 100,000 km^2	Precipitation Enhancement and Hail Suppression	Liaoning Province	1991 Every year Yes	Weather Service (G)	In-cloud seeding with rockets and 3 A/C.	AgI, 0.30 kg/hour. Total annual consumption 20 kg	Convective and stratiform clouds with bases warmer than 10°C and top temp. between 0 and – 20^0 C. Seeding criteria: cloud bases lower than 2 kms and tops higher than 4 kms	Feb-Oct 34 days	Evaluation based on comparison with historical records. No document available EIS-No C/B-Yes
CROATIA											
CR-1	Op. Hail	24,000 km^2	Hail Suppression	North Croatia, between Sava and Drava Rivers	1970 Every year Yes	Agr. (G) Wea. Ser. (G) Ins. (P)	Ground- based seeding with 491 acetone burners and in-cloud seeding with rockets.	AgI, 9.1 kg per seeding day. Total consumption 428 kg	Convective clouds with bases colder than 10°C and tops colder than –20°C. Seeding criteria: cloud tops above – 28^0 C level and top of 45 dBz echo in excess of 1.4 km above 0^{0}C level.	May – Sept. 54 days	Document on evaluation planned and will be available internationally when finished. EIS-No C/B -No

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FRANCE											
FR-1	Res. Op. Hail	Target: 60,000 km^2 Control: 420,000 km^2	ANELFA	Aguitan and Rhodanian basins and Loire valley	1952 Every year Yes	Agr. (P)	Ground based seeding with 649 acetone burners	AgI, 8g/hour per burner. Total consumption: 875 kg	Convective clouds with bases warmer than 10°C and tops colder than –20°C. Seeding criteria: hailstones predicted that would damage agriculture	15 April – 15 Oct. 58 days	Evaluation based on data from hail pads. Report available EIS-Yes C/B-Yes
FR-2	Dev. Hail	Target 400 km^2 Control 800 km^2		Tarn et Garonne	1994 Every Year Yes	Agr (P)	Cloud base seeding from 1 A/C using pyrotechnic flares	Hygroscopic salts at rate of 2 kg/4 min. Total consumption 80 kg	Convective clouds with bases lower than 10°C and tops colder than –20°C. Seeding based on forecasts of hail storms from Meteo France	May-October	Evaluation based on hailpads and 5 cm radar using TITAN
GERMANY											
GE-1	Res. Op. Hail	Target: 4,400 km^2	Hagelabwehr/ Hagelfor schungs-verein Rosenheim	Northern side of the Alps , hilly terrain between 500-1900m	1975 Every year Yes	Municipal	Cloud base seeding with acetone burners from 2 A/C	AgI, 0.5kg/hour Total annual consumption 37 kg	Convective clouds with bases warmer than 10°C and tops colder than 0°C but warmer than –20°C. Seeding criteria: based on temp, type of advection, vertical windspeed, humidity, fronts, troposphere height, radar echoes, infrared satellite photos and sferics	May - Sept. 19 days	Evaluation based on documented hailfall. Evaluation document available. EIS-No C/B-No
GREECE											
GR-1	Res. Op. Hail	2,350 km^2 Target area	Hellenic National Hail Suppression Project	NW Greece	1984 Interrupted Yes	Agr. (G)	Cloud base and cloud top seeding with pyrotechnic flares from 2A/C.	AgI 240 g/min 65,840 kg	Convective and orographic clouds with bases colder than 10°C and tops colder than -20°C. Seeding criteria: cloud tops at least 5 km and radar reflectivity at least 35 dBz.	Apr - Sept. 20 days	Evaluation based on comparison with historical records., crop damage and hail pads. Final evaluation available EIS-Yes C/B-Yes (to be available in 2001)

GR-2	Op. Hail	56 km^2 Target area		5 different Greek provinces	1982 Every year Yes	Agr (G)	G/B Hail canons	Shock waves from canons	Convective clouds	April to October about 25 days each year	Evaluation based on comparison with historical records and crop damage. No evaluation report EIS-No C/B-No
ISRAEL											
IS-1	Op. PE (R)	Target 5,000 km^2 Control 1,500 km^2	Israel Enhancement Project	Northern Israel	1960-1975 Experimental. Since 1975-operational Every year Yes	Agr (G) Hyd (G)	40 G/B acetone burners and 3 A/C with acetone burners	AgI G/B at 12 g/hour each. A/C at 500 g/hour each. Total consumption 200 kg	Convective clouds with bases colder than 10°C, tops both warmer and colder than –20°C. Microstructure of unseeded clouds measured. Seeding criteria cloud tops below –8°C .	Nov - April	Evaluation based on historical records. Document available EIS-No C/B-Yes
LIBYAN ARAB JAMAHIRIYA											
LI-1	Rs Op. PE Inc.	Target area 69,000 km^2	Cloud Seeding Research Centre	Tripoli, Sirt, El-Marj	1980 Not implemented every year Yes	Trans (G)	Seeding with explosives from 2 A/C in cloud and cloud top.	AgI Total consumption 14.4 kg	Convective and orographic clouds with bases colder than 10°C and tops colder than 0° but warmer than –20 °C. Seeding criteria based on synoptic situation	Jan - March Oct - Dec. Each year 183 days	Evaluation based on comparison with historical records, report not available. EIS-No C/B-No
MALAYSIA											
MAL-1	Op. PE (E)	Whole country	Drought Operation	Whole country	1997 Every year Yes	Wea. Serv. (G)	In cloud seeding With NaCl liquid spray from 2 A/C. Seeding between 5000 and 9000 feet.	NaCl , 100 kg per day Total annual consumption : 800 kg	Convective clouds with bases warmer than 10°C top warmer than –20°C but colder than 0°C.	July – Sept 8 days	No evaluation provision EIS-No C/B-No

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MOLDOVA											
MOL-1	Op Hail			The Republic of Moldova	1967 Every year Yes	Agr (G)					Evaluation based on comparison with historical records. EIS-Yes C/B-Yes
RUSSIAN FEDERATION											
RF-1	Hail Op. Res. Dev.	Target: 20,000 km^2 Control: 12,000 km^2	Antihail Crop Protection with Rockets	Northern Caucasus	1960 Every year Yes	Agr. (G) Wea. Ser. (G)	In-cloud and cloud base seeding with pyrotechnic flares on rockets at temp - 4–5^{0}C.	AgI. Total annual consumption: 40 kg	Convective clouds with bases colder than 10°C and tops colder than –20°C Seeding criteria based on radar reflectivity and degree of convective instability.	Apr. - Sept . 46 days	Evaluation based on comparison with historical record, crop damage, and hail pads. Report available EIS-Yes C/B-Yes
RF-2	Res. Op. Dev. PE (R) Inc. PR	Target: 60,000 km^2	Artificial Regulation of Precipitation	Stavropolski Region, Rep. of Kalmykiya	1986 Every year Yes	Agr. (G) Wea. Ser. (G)	In-cloud and cloud top seeding from 3 A/C at temp. -3 - -5^{0}C using pyrotechnic flares, liquid spray and solid dispersal.	AgI , dry ice and liquid nitrogen. Total annual consumption: 12 kg , 6,000 kg and 1,500 kg, respectively.	Convective and stratiform clouds with bases colder than 10°C and top temp. between 0 and -20°C . Microphysics of unseeded clouds is measured. Seeding criteria: Cloud top temp. not more than -10^0 C, cloud depth no less than 2 km.	April – October 66 days	Evaluation based on comparison with historical records. Report available EIS-Yes C/B-Yes
SOUTH AFRICA											
SA-1	Res Op. PE	10,000 km^2 Target area	South African Rainfall Enhancement Programme	Northern Province South Africa	1997 Every Year No	Hyd. (G) Res. Found. (G) Wea. Serv. (G)	Seeding cloud base with hygroscopic flares from 2 A/C	NaCl, KCl and MgO in hygroscopic flares.	Convective clouds with bases warmer than 10°C and top temp. colder than –20°C. Seeding criteria: radar reflectivity 30 dBz and well defined updraft area. Microstructure of unseeded cloud measured.	October – December 21 days	Evaluation based on seed/no seed storm track properties from time of storm origin. Report available EIS-No C/B-Yes

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SPAIN											
SP-1	Op. Hail	350,000 Ha	2000 Hail suppression project in Aragon	Various township in Zaragoza and Teruel	1970 Every Year Yes	Agr (G)	G/B seeding from 92 acetone burners	Agl, 8.8 litres per generator. Total annual consumption 810 litres	Convective clouds with bases lower than 10°C and with tops colder than –20°C. Seeding criteria based on met. forecasts of possible hail	May – October 40 days	Evaluation based on crop damage. No report EIS-No C/B-No
SYRIAN ARAB REPUBLIC											
SY-1	Op PE, Inc. (R) PR	Target: 120,000 km^2 Variable control area	Syrian Cloud Seeding Project	Countrywide	1991 Every year Yes	Agr (G) Wea Ser (G)	Cloud top seeding from 4 A/C	Agl at various consumption rates. 800 kg total consumption.	All cloud types with bases colder than 10°C and tops colder than 0°C but warmer than –20°C. Microstructure of unseeded clouds measured. Seeding criteria based on cloud characteristics and synoptic situation.	Oct – Dec Jan – May 24 days	Evaluation based on comparison with historical records. Report available EIS-No C/B-Yes
TAJIKISTAN											
TD-1	Op. Hail	Target area 1800 km^2	TD - 1	Gissar and Vakhsh Velleys	1964 Every year Yes	Agr. (G)	In-cloud seeding with rockets		Convective clouds with bases colder than +10° C and top temp. colder than – 20° C. Microstructure of unseeded clouds measured. Seeding criteria is based on radar data and probability of hail.		Evaluation based on historical records and crop damage. Document not available. EIS - Yes C/B - Yes
UKRAINE											
UKR-1	Hail Op	Target area 2400 km^2	Hail Neutrali Zation UK-2	Crimea, Ukraine	1968 Every year Yes	Agr (G)	In-cloud seeding with rockets	Agl. Total consumption 2 kg	Convective clouds with bases colder than 10°C and tops colder than –20°C. Seeding based on cloud properties	May – Sept. 6 days	Evaluation based on historical records EIS-Yes C/B-Yes

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UNITED STATES OF AMERICA											
US-1	PE Snow Augmentation	435 km^2	NOAA 99-1030 01-1067	Mokalumne California		(P) Pacific Gas and Electricity Company		Agl. Total consumption 26.3 kg		Jan –May Nov -Dec 29 days	Report available
US-2	PE Snow Augmentation	1,280 km^2	NOAA 01-1069 99-1031	Lake Almanor California		(P) Pacific Gas and Electricity Company		Ag l Total consumption 39.8kg		Jan – May Nov – Dec 40 days	Report available
US-3	PE Snow Augmentation	256 km^2	NOAA 99-1022 01-1074	Central Colorado		(P) Western Weather Consultant		Agl total Consumption 22.4 kg		Jan and Nov-Dec 46 days	Report available
US-4	PE Snow Augmentation	650 – 2560 km^2	NOAA 99-1032 01-1063	Northern Utah		Cache County (G)		Agl Total consumption 20.51 and 1231 kg dry ice		Jan – Apr and Dec 39 days	Report available
US-5	PE Snow Augmentation	25,600 km^2	NOAA 99-1033 01-1085	Central and Southern Utah		(P) Utah Water Resource Development Corporation		Agl Total consumption 38.554 kg		Jan – March and Nov - Dec 33 days	Report available
US-6	PE Snow Augmentation	722 km^2	NOAA 00-1050	Wind River Wyoming		Eden Valley Irrigation and Drainage District		Agl. Total consumption 0.144 kg		Jan 2 days	Report available
US-7	PE	1,587 km^2	NOAA 99-1021	Santa Barbara California		Santa Barbara County (G)		Agl. Total consumption 10.961 kg		Jan – Apr 20 days	Report available
US-8	PE Snow Augmentation	8,235 km^2	NOAA 01-1070 99-1027	Nevada		State of Nevada (G)		Agl Total consumption 24.7 kg		Jan-May Oct-Dec 63 days	Report available
US-9	PE Snow Augmentation	2,790 km^2	NOAA 99-1025 01-1071	Truckee Tahoe Project Nevada		State of Nevada (G)		Agl, Total consumption 12.563 kg		Jan-Feb Oct-Dec 33 days	Report available

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US-10	PE	8,960 km^2	NOAA 00-1048	Colorado River Texas		Colorado River Municipal Water District		Agl. Total consumption 3.065 kg		Mar-Oct 18 days	Report available
US-11	PE	2,980 km^2	NOAA 00-1052	North Dakota District		N. Dakota atmospheric Research Board		Agl and dry ice. Total consumption 25.0 kg and 418.6 kg respectively		June – August 20 days	Report available
US-12	PE	22,920 km^2	NOAA 00-1053	North Dakota District II		N. Dakota atmospheric Research Board		Agl and dry ice. Total consumption 83.0 kg and 1094 kg respectively		June-August 38 days	Report available
US-13	PE Hail	37719 km^2	NOAA 01-1078	West Kansas		W. Kansas Weather Modification		Agl and dry Ice. Total consumption 118.01 kg and 950 kg, respectively		Apr-Sept. 50 days	Report available
US-14	PE	1,152 km^2	NOAA 00-1038	Eastern Sierra California		Los Angeles City		Agl. Total consumption 1678 kg		Jan-Dec 23 days	Report available
US-15	PE	1,280 km^2	NOAA 00-1039	Kaweah River California		Kaweah Delta Water Conservation District		Agl. Total consumption 11.53 kg		Jan – Nov 28 days	Report available
US-16	PE	3,072 km^2	NOAA 00-1040	Kern River California		North Kern Water Storage district		Agl. Total consumption 11.591 kg		Jan-Dec 31 days	Report available
US-17	PE	4,096 km^2	NOAA 00-1041	Kings River California		Kings river conservation district		Agl. Total consumption 20.640 kg		Jan – Dec 32 days	Report available
US-18	PE Snow aug men tation	880 km^2	NOAA 00-1045 01-1081	Clark county, Idaho		Mud Lake Water Users		Agl. Total consumption 9.979 kg		Jan-Apr and Dec 32 days	Report not available

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US-19	PE	3072 km^2	NOAA 00-1042	San Joaquin River California		(P) Southern California Edison Company		Agl. Total consumption 36.151 kg		Jan-Dec 51 days	Report available
US-20	PE	3,072 km^2	NOAA 98-993	Tuolumne River California		Turlock Irrigation District		Agl. Total consumption 7.5 kg		Jan-Dec 22 days	Report available
US-21	PE Snow aug men tation	1,216 km^2	NOAA 99-1026 01-1072 Tuscarora	Nevada		Municipal		Agl. Total consumption 16.813 kg		Jan-May Nov-Dec 47 days	Report available
US-22	PE Snow aug men tation	1,220 km^2	NOAA 09-1029 01-1073 Toiyabe Nevada	Nevada		Municipal		Agl. Total consumption; 5.532 kg		Jan-Apr Nov-Dec 29 days	Report available
US-23	Fog	2.5 km^2	NOAA 98-985	Salt Lake City Airport		Delta Airlines		Dry ice 1209 kg		Jan-Feb 3 days	Report available
US-24	PE	46875 km^2	NOAA 00-1055	High Plains Texas		High Plains Under ground water conservation		Agl. Total consumption 55.04 kg. Dry ice consumption 7450 kg		Apr-September 53 days	Report available
US-25	PE Hail	178,950 km^2	NOAA 00-1047	Oklahoma		Oklahoma Wea. Mod		Agl. Total consumption 319.75 kg		Mar-Oct 84 days	Report available
US-26	PE	14,000 km^2	NOAA 00-1051	Texas Panhandle		Panhandle groundwater conservation		Agl. Total consumption 17.02 kg		May-Aug 19 days	Report available
US-27	PE Snow Aug men tation	25 km^2	NOAA 01-1062	Alta/Snowbird Utah		Snowbird Ski Resort (P)		Agl Total consumption 2.726 kg		Oct-Dec 14 days	Report available
US-28	PE Snow aug men tation	8,166 km^2	NOAA 99-1028 01-1069	Ruby mountains, Nevada		State of Nevada		Agl 42.73 kg		Jan-May Oct-Dec 52 days	Report available

IV. REGISTER OF 2000 REPORTED PROJECTS

US-29	PE Snow aug men tation	256 km^2	NOAA 99-1024	Southern Nevada		State of Nevada		Dry ice, total consumption: 0.035 kg		March 1 day	Report available
US-30	PE	384 km^2	NOAA 99-1034	San Gabriel Mountains California		Municipal		Agl. Total consumption 1.42 kg		Jan-Apr 11 days	Report available
US-31	PE Snow Aug men tation	154 km^2	NOAA 99-1023 01-1075	Telluride San Miguel Colorado		South Western Water Conservation district		Agl. Total consumption 5.981 kg		Jan and Nov-Dec 36 days	Report available
US-32	PE	604 km^2	NOAA 01-1076 00-1036	Sacramento County, California		Municipal		Agl. Total consumption 9.773 kg		Jan-Apr Oct-Dec 22 days	Report available
US-33	PE Hail	22,259 km^2	NOAA 01-1083	Southwestern Texas		South West Texas Rain Enhancement		Agl. Total consumption 25.362 kg		Apr-Nov 46 days	Report available
US-34	PE	25,510 km^2	NOAA 00-1046 Edwards Aquifer Precipitation	Texas		Edwards Aquifer Authority		Agl. Total consumption: 29.329 kg		Mar-September 45 days	Report available
US-35	PE Snow Aug men tation	435 km^2	NOAA 00-1044	Grand Mesa Project Colorado		Water Enhancement Authority		Agl. Total consumption 3.141 kg		Feb-Mar 15 days	Report available
US-36	PE	43850 km^2	High plains Enhanceme nt NOAA 00-1049	Texas		High plains underground water		Agl. Total consumption 51.472 kg		Apr-Aug 52 days	Report available
US-37	PE		Panhandle Groundwater 00-1054	Texas		Panhandle ground water conservation		Agl. Total consumption 14.540 kg		May-September 25 days	Report available
US-38	PE Snow Aug men tation	2560 km^2	NOAA 01-1064	Utah		Weter basin water conservation		Agl total consumption 1.395 kg		Dec 4 days	Report available
US-39	PE Snow Aug men tation	1536 km^2	NOAA 01-1065	Colorado Western San Juan		SW Water conservation District		Agl. Total consumption 5.526 kg		Nov-Dec 18 days	Report available

US-40	PE	471,040 km^2	NOAA 01-1079	District V, Idaho		Muni Oneida county				Dec 2 days	Report available
UZBEKISTAN											
UZ-1	Op. Res Hail	7,380 km^2	Hail suppression project	Fergan Valley, Surhardaryn, Kashkadaryn and Samarkand regions	1969 every year	Agr (G)	In-cloud seeding with rockets with pyrotechnic flares. Seeding in layer from –6°C to –30°C	AgI at a rate of 20g/km^3 total consumption: 7.1 kg	Convective clouds with bases warmer than 10°C and tops colder than –20°C. Seeding criteria based on presence of Cb clouds, cloud top heights, radar reflectivity heights of –6 and –10°C levels	Apr-Aug 20 days	Evaluation based on comparison with historical records. Report available EIS-No C/B-Yes
YUGOSLAVIA											
YU-1	Op. Hail	50,716 km^2	Hail suppression system in Serbia	Republic of Serbia	1967 Every year Yes	Agr (G) Wea. Ser. (G)	In-cloud seeding with rockets	AgI, 4.6 g per cloud total consumption 1.364 kg	Convective clouds with bases colder than +10°C and tops colder than –20°C. Seeding criteria: Max reflectivity in excess of 45 dbZ, max reflectivity level above 0°C level, radar echo above – 14° C and radar echo top above –28 °C level	Apr – Oct 34 days	Evaluation based on crop damage data. Evaluation document available EIS-No C/B-Yes
ZIMBABWE											
ZM-1	Op. PE Inc.		S. Chid zambwa	Countrywide	1968 Every year Yes	Wea. Ser (G)	Cloud base seeding with explosives from 2 A/C	Seeding material composed of KCl, MgO and NaCl	Convective clouds with bases colder than +10°C. Microstructure of unseeded cloud measured. Seeding criteria based on visible characteristics of cloud with well defined up-drafts	Jan-Mar Every day	Evaluation document not available C/B-Yes EIS-No

V. ADDRESSES OF REPORTING AGENCIES

AUSTRALIA	Hydro Tasmania P.O. Box 355 HOBART, Tasmania 7001
AUSTRIA	Central Institute of Meteorology and Geodynamics Department of Climatology Hohe Warte 38 A-1190 VIENNA
BULGARIA	National Institute of Meteorology and Hydrology Bulgarian Academy of Sciences 66, Tsarigradsko Chaussee SOFIA 1784
CANADA	Atmospheric Environment Service 4905 Dufferin Street DOWNSVIEW, Ontario, M3H 5T4
CHILE	Direccion Meteorologica de Chile Departamento de Meteorologia Applicada Casilla 63, Aeropuerto Internacional Arturo Merino Benitez SANTIAGO
CHINA	China Meteorological Administration 46 Baishiqiao Road BEIJING, 100081
CROATIA	Meteorological and Hydrological Service of Croatia Department of Hail Suppression 3, Gric ZAGREB, 10000
FRANCE	Association Nationale d'Etude et de Lutte contre les Fléaux Atmosphériques 52, rue Alfred Duméril 31400 TOULOUSE
GERMANY	Landratsamt Rosenheim 53, Wittelsbacherstrasse 83022, ROSENHEIM
	Brandenburgische Technische Universitat Cottbus Postfach 10 13 44 03013 COTTBUS
GREECE	Hellenic Agricultural Insurance Organization 45 Mesogion Street P.O. Box 14103 11510 ATHENS

ISRAEL	Israel Meteorological Service Rain Enhancement Division P.O. Box 20 BEN GURION AIRPORT, 70100
LIBYAN ARAB JAMAHIRYA	General Transport and Communication Meteorological Department Cloud Seeding Administration P.O. Box 5069 TRIPOLI
MALAYSIA	Malaysian Meteorological Service Ibu Pejabat Kajicuaca Jalan Sultan 46667 PETALING JAYA
MOLDOVA	Anti Hail Service Ministry of Agriculture and Processing Industry Grenoble str. 193 277043 KISHINEV
RUSSIAN FEDERATION	Russian Federal Service for Hydrometeorology and Environmental Monitoring 12 Novovaganikovsky street 12 MOSCOW 123242
SOUTH AFRICA	South African Weather Bureau Private bag X97 PRETORIA 0001
SPAIN	Gobierno de Aragon Centro de Proteccion Vegetal Apartado 727 50080 ZARAGOZA
SYRIAN ARAB REPUBLIC	Meteorological Department Rain Enhancement Project Joul Jammal Street P.O. Box 4211 DAMASCUS
TAJIKISTAN	Main Administration for Hydrometeorology of Tajikistan Hail Suppression Service 47, Shevchenko Str., DUSHANBE
UKRAINE	Ukraine Hydrometeorological Research Cloud Modification Section Probpekt Navki 37 KIEV 28

UNITED STATES OF AMERICA	National Oceanic and Atmospheric Administration National Weather Service 1325 East-West Highway SILVER SPRING, MD 20910-3283
UZBEKISTAN	Main Administration of Hydrometeorology 72, Makhsumov st. 700052 TASHKENT
YUGOSLAVIA	Federal Hydrometeorological Institute 6, Bircaninova POB 604 YU 1101 BEOGRAD
ZIMBABWE	Ministry of Transport Zimbabwe Meteorological Service PO Box BC 150 HARARE

VI. MEMBER COUNTRIES REPORTING ON COMPLETED PROJECTS

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VII: MEMBER COUNTRIES REPORTING ON COMPLETED PROJECTS

LOCATION AND TERRAIN	PURPOSE AND DURATION	AGENT AND ALTITUDE OF SEEDING	REFERENCES TO PUBLISHED RESULTS	CONTACT FOR INFORMATION
ARMENIA				
Armenia all types of terrain in Lake Sevan basin Hail-10,040 km^2 target area and 4000 km^2 control area PE – 4170 km^2 target area and 2000 km^2 control area	Hail suppression and precipitation enhancement Hail 1964 – 91 PE 1970 -90	AgI. Ground based seeding with 3 generators, 2A/C for PE, rockets and artillery shells for hail. 3 year experiment using super meteoron for PE conducted. Pyrotechnic flares and solid dispersal. Seeding at $-6 \pm 3^{\circ}C$ level for hail. Convective clouds (hail) and orographic and layer clouds for PE. Bases colder than 10°C tops warmer than –20°C (PE). Radar reflectivity and cloud thickness greater than 2 km (hail) There were 12 anti-hail teams equipped with radars and 55 missiles sites	Evaluation based on randomization (PE) and comparison with historical records, crop damage and hail pads. EIS-Yes C/B-Yes	R.S. Ovsepyan Armenhydromet Centre for Weather Modification Leo Str 54 Erevan 375002 Armenia
CHINA				
Hebei Province, mountainous and flat terrain Hail and PE – 12,000 km^2 target area. Cross over, variable	Hail suppression and precipitation enhancement 43 years with artillery shells, 3 years with rockets May-October each year	AgI		Weather Modification Office Hebei Province C/o China Meteorological Administration 46 Baishiqiaolu Road Beijing, 100081
Henan, Shandong, Jilin and Hebei provinces. Mountainous and hilly terrain PE – 3000km^2 target area and 2000 km^2 control area Target and control, 80 km^2 between areas. Both fixed and variable depending on clouds	Study of techniques for precipitation enhancement and agricultural damage mitigation 5 years (1996-2000)	AgI, CO_2 and NaCl. Airborne and ground-based seeding with 3 rockets and 4 cannons between 3-6 km altitude. Seeding track 450 km at 44 l/hr and 29g AgI/hr. 200 precipitation gauges (recording). Standard seeding period of 480 hrs. Seeding undertaken when clouds contain supercooled water. Verification based on radar reflectivity and A/C measurements. Both fixed target and variable target methods used to analyse. Qualitative results show increased precipitation. 15% more from stratiform and 20% more from convective clouds.	Quaterly Journal of Applied Meteorology, 2001, Vol 12	Chinese Academy of Meteorological Sciences

VII: MEMBER COUNTRIES REPORTING ON COMPLETED PROJECTS

LOCATION AND TERRAIN	PURPOSE AND DURATION	AGENT AND ALTITUDE OF SEEDING	REFERENCES TO PUBLISHED RESULTS	CONTACT FOR INFORMATION
FRANCE				
Hilly terrain in southwest, centre, centre east and southeast of France. Target 60,000km^2. Fixed Target only. 9 departments in SW France 2 departments in central France 3 departments in SE France	Hail suppression from both convective and frontal clouds, (ANELFA), 48 years, 15 April to 15 October	AgI from 649 around-based generators. Verification aided by a network of 1000 hail pads installed in target zone. Experimental unit: 1 day. Decision on seeding based on forecast of hail . Average about 19 days for each department. Seeding period 8 hours per day. Evaluation method correlation between emissions of AgI and hailfall intensity. Quantitative results show 42 % decrease of hail with diameters more than 7 mm. The evaluation of the ANELFA programme does not follow the classic randomized procedure normally used in weather modification. This evaluation is done on the study of the size distribution of hailstones as a function of seeding rates.	Dessens, J. 1999 ; A physical evaluation of a hail suppression project with silver iodide ground burners in Southwestern France. J. Appl. Meteo., 37, 1588-1599 Dessens, J, and R. Fraile, 2000 : the effect of silver iodide seeding on hailstone size distributions. J. Wea. Modification, 32, 26-30	Association Nationale d'Etude et de Lutte contre les Fléaux Atmosphériques 52 rue Alfred Duméril 31400 TOULOUSE
Tarn-et-Garonne? Flat terrain, fixed. Cross-over. 1200 km^2. Target	Hail suppression: test of a new technique of microphysical characteristics of hail storms. 4 years (1995-1998). May – 10 October	NaCl and CaCl seeding at base of cumulus clouds from A/C. Trajectory 40 km max. at 30kg/hr. A total of 120 raingauges with 12 in target area. Other verification quantities based on 5 cm radar and TITAN with 480 hail pads. Experimental unit: duration of cell identified by radar with Z >25/30 dB, Hail forecast, updraughts >3m/s, about 100 seeded for 15-25 minutes. Project results based on a comparison between the two types of salt which showed no difference. A decrease in hail size was noted but a randomized experiment would be needed for a scientific demonstration.		Jean François Berthoumieu ACMG avec AEAG Aerodrome Agen 47520 Le Passage
LIBYAN ARAB JAMAHIRIYA				
Libya. Mountainous and flat. Variable target and control areas. Area definition variable depending on suitability of clouds. Cross-over	Cold cloud seeding to increase precipitation during winter period (October-March). 20 years.	Airborne seeding of clouds using AgI in the 3000-5000 meter range. Seeding rate variable and length of seeding track 1-5 kms. 220 stardard raingauges, unit duration 1-2 hours. Cloud top temps. Colder than –10°C. Unrestricted randomization and daytime seeding, quantitative results unknown.		Cloud Seeding Administration Meteorological Department TRIPOLI

VII: MEMBER COUNTRIES REPORTING ON COMPLETED PROJECTS

LOCATION AND TERRAIN	PURPOSE AND DURATION	AGENT AND ALTITUDE OF SEEDING	REFERENCE TO PUBLISHED RESULTS	CONTACT FOR INFORMATION
TAJIKISTAN				
Gissarskaya and Vakhshskaya Valleys. Hillyterrain. Target only. Fixed	Hail suppression to protect agriculture. 37 years from April to July	AgI		K.K. Rasulov Hail Protection Service 47 Shotemur street Dushanbe 734025
UZBEKISTAN				
Uzbekistan Mountainous terrain. 7380 km^2 target area. Target only. Fixed area	Hail suppression to protect agriculture . 32 years from April-August	AgI seeding of cumulus clouds. 58 raingauges in target area. Other verification quantities include radar reflectivity and journeys round hail affected area to assess damage and size of hailstones. Seeding based on radar and need for reflective area to be greater than 2.5 km deep. 44 units seeded with 30 for hail and 14 aimed at interrupting showers. Seeding period 2-30 minutes, max. 1.5 hours. Project results based on diminution in radar reflectivity and the visual characteristics of clouds. Results of each test determined from extent of hail damage to crops. No statistical significance was determined. Work was done on the effect of the anti-hail system on the precipitation scheme. None was discovered. Seeding was carried out using unguided reactive devices from the ground.	Systematic recommendations on forecasting hail, intensity Comp: R.G. Shadyyev, Kh.A. Tmamjanov., Tashkent, 1987-17 c) Kh. A. Tmanjanov, Parametrical model of hail bearing thunder clouds goskomhydromet 1984, 100/181 pp 36-40 B.A. Kamalov, V.V. Sabayev, S.V. Usmakov. An evaluation of the effect of the anti-hail system on the precipitation scheme in the Terganskaya valley. (Works of the Scientific Research institute of Meteorological Information, Goskomhydromet, 100 (181) pp 56-75). Kh.A. Tmanjanov: Hail and Hail Damage in North-east Uzbekistan, Works of SRTMT, 1990 110(191) pp 87-95.	Weather Modification Agency Glavgidromet Tashkent

VII: MEMBER COUNTRIES REPORTING ON COMPLETED PROJECTS

YUGOSLAVIA				
Republic of Serbia. All types of terrain. Target area, 50,716 km^2. Target only. Fixed	Hail suppression in Serbia. 34 years 15 April – 15 October	AgI seeding of cumulus clouds. 550 precipitation gauges. Also verified by radar reflectivity. 34 days duration of unit. Clouds seeded or not depending on radar reflectivity log Z > 4.5 max radar reflectivity height above 0°c, the height of increased radar echo above –14°C and radar echo top height above –28°C 297 seeded and 1940 not seeded.		Zoran Babic Republic Hydrometeorological Service of Serbia Kneza Viseslava 66 11000 Belgrade

VIII. MEMBER COUNTRIES REPORTING *NO* WEATHER MODIFICATION PROJECTS IN 2000

Argentina
Belize
Bosnia and Herzegovina
Dominica
Dominican Republic
Ecuador
Egypt
Guyana
Hungary
Iceland
India
Ireland
Kenya
Kyrgyzstan
Latvia
Lithuania
Netherlands
Nigeria
Norway
Oman
Paraguay
Peru
Poland
Sao Tome and Principe
Seychelles
Singapore
Slovenia
Sweden
Switzerland
Tunisia
Turkey
United Kingdom
Venezuela

WEATHER MODIFICATION PROGRAMME REPORTS

1. Review of Warm Cloud Modification by Bh. V. Ramana Murty (September 1984) (TD No. 5)

2. Papers presented at the Fourth WMO Scientific Conference on Weather Modification (Honolulu, Hawaii, 12-14 August 1985) (TD No. 53)

3. Notes for the International Cloud Modelling Workshop/Conference (Irsee, Federal Republic of Germany, 15-19 July 1985 (out of print) (TD No. 57)

4. Register of National Weather Modification Projects 1983 (November 1985) (TD No. 78)

5. The Evaluation of Hail Suppression Experiments – Report of Meeting of Experts (March 1986) (TD No. 97)

6. Information concerning Weather Modification directed to Government Decision-Makers (June 1986) (TD No. 123)

7. Trends in Weather Modification 1975-1983 (L.R. Koenig, Geneva, November 1986)

8. Report of the International Cloud Modelling Workshop (Irsee, Germany, 15-19 July 1985) (TD No. 139)

9. Register of National Weather Modification Projects – 1984 and 1985 (Geneva, July 1987) (TD No. 182)

10. Register of National Weather Modification Projects – 1986 (Geneva, December 1988) (TD No. 208)

11. Report of the Second International Cloud Modelling Workshop (Toulouse, 8-12 August 1988) (TD No. 268)

12. Papers submitted to the Fifth WMO Scientific Conference on Weather Modification and Applied Cloud Physics (Beijing, China, 8.-12 May 1989) (TD No. 269)

13. Register of National Weather Modification Projects – 1987-1988 (TD No. 330)

14. Register of National Weather Modification Projects 1989 (Geneva, May 1991) (TD No. 417)

15. Report of a Meeting of Experts to Review Findings and Make Recommendations on the Saudi Arabia Cloud Physics Experiments (SACPEX), (Geneva, 14-16 November 1990)

16. Report of the Seventeenth Session of the Executive Council Panel of Experts/CAS Working Group on Physics and Chemistry of Clouds and Weather Modification Research (Geneva, 19 to 23 November 1990)

17. WMO Meeting of Experts on the Role of Clouds in the Chemistry, Transport, Transformation and Deposition of Pollutants (Obninsk, 30 September – 4 October 1991) (TD No. 448)

18. Register of National Weather Modification Projects 1990 (TD No. 449)

19. Proceedings - WMO Workshop on Cloud Microphysics and Applications to Global Change (Toronto, Canada, 10-14 August 1992) (TD No. 537)

20. Report of the Third International Cloud Modelling Workshop (Toronto, Canada, 10 to 14 August 1992 (TD No. 565)

21. Register of National Weather Modification Projects 1991 (TD No. 575)

22. Sixth WMO Scientific Conference on Weather Modification, Volumes 1 and 2 (Paestrum, Italy 30 May – 4 June 1994) (TD No. 596)

23. Register of National Weather Modification Projects 1992 (TD No. 686)

24. Eighteenth Session of the Executive Council Panel of Experts/CAS Working Group on Physics and Chemistry of Clouds and Weather Modification Research (Geneva, Switzerland, 30 January – 3 February 1995) (TD No. 687)

25. Register of National Weather Modification Projects 1993 and 1994 (TD No. 745)

26. Expert Meeting to Review the Present Status of Hail Suppression (Golden Gate, Highlands National Park, South Africa, 6-10 November 1995) (TD No. 764)

27. Nineteenth Session of the Executive Council Panel of Experts/CAS Working Group on Physics and Chemistry of Clouds and Weather Modification Research (Geneva, Switzerland, 5 to 9 May 1997) (TD No. 820)

28. Register of National Weather Modification Projects 1995 (TD No. 851)

29. Report of the Fourth International Cloud Modelling Workshop (Clermont Ferrand, France 12 to 16 August 1996) (TD No. 901)

30. Proceedings of the WMO Workshop on Measurements of Cloud Properties for Forecasts of Weather and Climate (Mexico City, 23-27 June 1997) (TD No. 852)

31. Seventh WMO Scientific Conference on Weather Modification (Chiang Mai, Thailand, 17 to 22 February, 1999) (TD No. 936) (3 volumes)

32. Register of National Weather Modification Projects 1996 (WMO TD No. 939)

33. Report of the WMO Workshop for the Planning of Precipitation Enhancement Projects in the Mediterranean SE Europe and Middle East Countries (MEDSEEME-PEP) Monselice, Italy 8 to 11 December 1999) (WMO-TD No. 998)

34. Register of National Weather Modification Projects 1997 and 1998 (WMO-TD No. 1001)

35. Report of the WMO International Workshop on Hydroscopic Seeding Experimental Results, Physical Processed and Research Needs (WMO TD No. 1006)

36 Report of the Executive Council Panel of Experts/CAS Working Group on Physics and Chemistry of Clouds and Weather Modification Research (Geneva, 20-24 November 2000) (WMO TD No. 1059)

37. Register of National Weather Modification Projects 1999 (WMO TD No. 1060)

38. Register of National Weather Modification Projects 2000 (WMO TD No. 1094)