Flood Forecasting at FF&WC - 1997

Draft Work Report of T. van Kalken
Danish Hydraulic Institute
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FAP-10

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Setup of Real Time Flood Forecasting System at FFWC - 1997

1. Introduction

Real time Flood Forecasting using the newly developed systems established under FAP10 commenced in the 1996 monsoon. The main components of the new system, which runs under Window95 are:

- New "Flood Watch" (FW) database, with data entry, checking and processing facilities built in.
- Automated transfer of telemetry and databox data to the FW database
- Automated transfer of data from the FW database to MIKE11 database
- Automated transfer of MIKE11 forecasts to the FW database
- Automated generation of forecast bulletins.
- Generation of flood inundation maps
- Real time water level and rainfall status display

All components of the new system are integrated within a single graphical user interface (GUI), based on the ArcView GIS package.

2. Background to Updates made in the period October 1996-June 1997

Since the end of the last monsoon, a number of additional water level and rainfall stations have been added to the real time hydrological station network. In addition, data transfer via databoxes from both new and existing stations has been initiated, and is in operation during the 1997 monsoon.

Work has also been carried out on the SuperModel setup at SWMC, with updated river cross sections added on the Old Barahmaputra and Old Dhaleswari and associated spill channels. The Sarigowain river basin in the NE has been reschematized to improve the model calibration results in this area. The ?? basin the NW has also been updated with a more detailed schematization originally produced by SWMC for separate road study in the area. The new real time data availability in 1997 has been fully exploited in a revised boundary and update station configuration.

Models for flashy river forecasting have been set up and calibrated for the Manu River in the NE, and the Karatoya-Atrai system in the NW. Additional data collection schedules have been established for the real time stations in these areas in order to obtain the best available data possible for these models.

The flood mapping facilities have been upgraded with new versions of both ArcView and MIKE11-GIS. All river embankments have now been included as a separate theme in the GIS, and are taken into account when producing flood inundation maps.

3. Real Time Data Collection System

3.1 Data Collection Schedules

With the establishment of the two flashy river models, in addition to the Super Model, additional data collection schedules have been established. Table 1 shows the schedules for rainfall and water level data collection for the Super Model, NE and NW flashy models. The most common data collection schedule is 3 hourly water levels, from 0600-1800, and daily rainfall at 0600.

3.2 Real Time Data Recording Stations

Table 2 lists the real time data stations used by the flashy river models and the Super Model. A number of new real time stations, representing both boundary and update stations have been added since the 1996 monsoon. The number of stations used in the model are as follows:

- Water Level – boundary
- Water Level –update
- Rainfall

3.3 Data Transmission Methods

In the past, data transmission has generally been by voice radio, supplemented by a few telemetric stations. As the number of real time stations has increased, there was a danger of radio congestion during the daily transmission window. To avoid this problem, FAP10 installed so called databoxes (or Magic Boxes) at all of the new, and many of the existing real time stations. Real time water level or rainfall data are entered directly into the databox by the gauge reader at the time of observation (the time is automatically recorded). Data stored in the box are automatically downloaded to pc100 at the FF&WC every day at a different frequency from the voice transmission. Stations with voice radio continue to transmit data by that method, and this dual system is likely to continue throughout the 1997 monsoon, to provide a backup to the databox transmissions. New stations transmit by databox only. (See Table 2)

Data transmitted by the new Japanese Telemetry system is recorded hourly in the Telemetry room. Special programs on pc102 retrieve this data and send it on to the main FW database on pc104. If this system breaks down, the telemetric data must be entered manually directly into the FW database.

Table 1. **Real Time Transmission Frequences**

WATER LEVEL	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
normal							■			■			■			■			■					
flashy nw							■			■			■			■			■			■		
flashy ne							■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■		
24 hour	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

RAINFALL	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
normal							■																	
flashy nw							■			■			■			■			■			■		
flashy ne							■																	
24 hour							■																	

EXPANSION OF FLOOD FORECASTING AND WARNING SERVICES **Date: 12th June 1997**

REGION	STATION	NO	TELE-METRY	DATA BOX	VOICE	TRANS-MISSION	STATUS	REMARKS
	Panchagarh	1		R H	R H	flashy nw	WL OK	rainfall data all zero
	Bhusirbander	2		H		flashy nw	OK	
	Dinajpur	3		R H	R H	flashy nw	WL OK	rainfall data all zero
	Badarganj	4		R H		normal	OK	
	Rohanpur	5		R H		flashy nw	OK	WL sometimes missing
	Phulbari	6		H		normal	not working	occasional data; no power supply
	Chakrahimpur	7		H		normal	OK	
	Gaibanda	8		R H		normal	WL OK	no rainfall data
	Mohadevpur	13		R H		flashy nw	OK	5 readings instead of 6; no power supply
	Hardinge Brg	18		H	H	normal	not working	occasional data
	Rajshahi	19		R H	R H	normal	not working	not using data box
	Chapai Nawab	20		R H	R H	normal	not working	occasional data
	Naogaon	21		R H		normal	not working	not using data box
	Bogra	22		R H		normal	not working	rainfall data OK; no water levels
	Chilmari	23		R H	R H	normal	not working	occasional data; rainfall data all zero
North West	Serajganj	25		R H	R H	normal	not working	occasional data

EXPANSION OF FLOOD FORECASTING AND WARNING SERVICES **Date: 12th June 1997**

REGION	STATION	NO	TELE-METRY	DATA BOX	VOICE	TRANS-MISSION	STATUS	REMARKS
North West	Kaunia	27		R H	R H	normal	not working	occasional data; no rainfall data
	Kurigram	28		R H	R H	normal	not working	occasional data; no rainfall data
	Dalia	29		R H	R H	flashy nw	not working	not using data box
	Pankha	41	H	H	H	normal	no data box	telemetry failed; require Orion, data box and solar cells required
	Jatrapur		H		H	hourly	OK	
	Pabna				R	normal	OK	
	Rangpur				R	normal	OK	
North Central	Tarahghat	12		H	H	normal	not working	not using data box
	Bhagyakul	14		H	H	normal	not working	not using data box
	Bahadurabad	24		R H	R H	normal	no data box	waiting for Orion and data box
	Goalondo	26		H	H	normal	not working	not using data box
	Bhairab Bazar	31		R H	R H	normal	not working	possible error in data box; no rainfall data
	Jamalpur	32		R H	R H	normal	no data box	waiting for Orion and data box
	Mymensingh	33		R H	R H	normal	no data box	waiting for Orion and data box
	Jagir	38		H		normal	no data box	waiting for Orion and data box
	Tongi		H		H	hourly	not working	telemetry failed

EXPANSION OF FLOOD FORECASTING AND WARNING SERVICES **Date: 12th June 1997**

REGION	STATION	NO	TELE-METRY	DATA BOX	VOICE	TRANS-MISSION	STATUS	REMARKS
	Nayarhat		H			hourly	OK	
North Central	Mirpur		H		H	hourly	OK	
	Dhaka		H		R H	hourly	OK	
	Rekabi Bazar		H			hourly	OK	
	Tangail				R	normal	OK	
	Dewanganj				R	normal	OK	
North East	Moulvi Bazar	9		R H	R H	flashy ne	OK	12 WL readings per day instead of 16
	Manu Rly Brg	10	R H	R H	R H	flashy ne	OK	no data from data box; telemetry OK
	Sarighat	15		H		normal	OK	some spurious readings
	Sylhet	17		R H	R H	normal	OK	weak signal - badly sited antenna
	Durgapur	30		R H	R H	normal	no data box	waiting for Orion and data box
	Sunamganj	34		R H	R H	normal	OK	
	Sheola	35		R H	R H	normal	OK	
	Kanairghat	36		R H	R H	normal	not working	not using data box
	Nakuagaon	37		R H		normal	not working	Orion, data box and solar cells required
	Jariajanjail	40		R H		normal	not working	Orion and data box required

EXPANSION OF FLOOD FORECASTING AND WARNING SERVICES

Date: 12th June 1997

REGION	STATION	NO	TELE-METRY	DATA BOX	VOICE	TRANS-MISSION	STATUS	REMARKS
North East	Lourergorh	42		R H		normal	not working	Orion, data box and solar cells required
	Habiganj			R H	R H	normal	not working	Orion and data box required
	Sherpur		H			hourly	not working	telemetry failed
	Shaistaganj		H			hourly	not working	telemetry failed
	Amalshid		H			hourly	not working	telemetry failed
	Comilla				R	normal	OK	
South	Goraì Rly Brg	39		H	H	normal	no data box	waiting for Orion and data box
	Kushtia				R	normal	OK	
	Faridpur				R	normal	OK	
	Khulna				R	normal	OK	
	Barisal				R	normal	OK	
	Chandpur	11		R H	R H	24 hour hourly r	3 hourly only	2 data boxes provided; no rainfall

R rainfall
H water level

4. The Flood Forecasting Model, SM97

4.1 Coverage

The Super Model covers the entire northern regions of Bangladesh, from north of the Ganges and Padma, and the North East Region above Bhairab Bazar. All major rivers and flood plains are included in the model. Some statistics of the model are as follows:

- Catchment area 82,000 km^2
- No. of catchments 216
- No. of river branches 195
- No. of link channels 207
- No. BC Weirs 40
- Total length of modelled rivers 7270 km.

4.2 Catchments

Catchments in the Super Model are mainly internal, ie lying within Bangladesh. However several catchment boundaries also extend across the border into India, particularly in the NW and NE areas. Rainfall runoff from the catchments is modelled by NAM using the data from the 8 real time stations located within or bordering close to the model area. Table 2 lists all the real time rainfall stations used by the model.

4.3 Rivers

Apart from the major rivers, the Jamuna, Ganges, Padma and Meghna, the model also includes all of the major rivers in the NW, NC and NE regions. The coverage of the model had been greatly expanded and intensified compared to the earlier model run before FAP10.

4.4 Boundaries

The Super Model utilizes real time data at 19 of a total of 46 boundaries. Where rating curves are available at upstream boundaries, these are used to generate discharge inflows to the model. Water levels are specified at the remaining real time upstream boundaries, and at the downstream boundary at Chandpur. A rating curve is used at the downstream boundaries on the Arial Khan. At the remaining river boundaries, either NAM inflows are used, or generated discharges from adjacent real time boundaries are scaled according to relative catchment areas. This latter technique is used extensively in the NE, where real time data are restricted to only a small number of boundaries. Table 3 lists the boundaries used in the Super Model.

Table 3. Super Model Boundaries

River	Chain-age	Type	Event	Remarks
A Piyang	0.00	Q	0.60*Sarighat	Scaled discharge
Active Chela	0.00	Q	0.15*Lourergorh	Scaled discharge
Akhira	0.00	Q	Q=10	NAM catchment NW-10
Alai-Mod	0.00	H	Gaibanda	
ArialKhan	48.35	QH	-	Rating curve boundary
Atrai-P	105.13	Q	Q=0	******
Atrai_L050	10.00	Q	Q=0	NAM catchment NW-33
Balu	0.00	Q	Q=0	NAM catchment NC-11
Bangshi	37.0	Q	Q=0	NAM catchment NC-1
Barak	0.00	Q	Barak	Total inflow to Surma and Kushiyara rivers at Amalshid
Bhugai	0.00	Q	Nakugaon	
Bhugai_R028A	0.00	Q	Q=0	Flood Cell, NAM catchment NE-01
C Jamuneswari	90.95	Q	Badarganj	
Dadbhanga	0.00	Q	Q=0	NAM catchment NC-2
Dhalagang	0.00	Q	0.25*Lourergorh	Scaled discharge
Dhalai	0.00	Q	Manu*0.33	Scaled discharge
Dharla	33	H	Kurigram	
Dhepa-Art	10.00	H	Dhepa-Art	Sink, flow out of the model.
Ganges	35.25	H	Hardinge Br	Boundary for 1995 setup only
Ganges-Ext	0.00	H	Pankha	
Gorai	11.901	H	Gorai RB	
Ich-Jamuna	59.00	H	Phulbari	
Jadukata	0.00	Q	Lourergorh	
Jadukata_LB	0.00	Q	Q=2	NAM catchment NE-13
Jafflong	0.00	Q	0.60*Sarighat	Scaled boundary
Jamuna-T	8.00	H	Noonkhawa	
Jhalukhali	0.00	Q	0.50*Lourergorh	
Juri_L022	0.00	Q	Q=0	Flood Cell, NAM catchment NE-26
Kala	0.00	Q	Q=10	NAM catchment NW-4

River	Chain-age	Type	Event	Remarks
Kushiy_RB	0.00	Q	Q=2	NAM catchment NE-21
Lower Meghna	17.4	H	Chandpur-MWL	
Lubhachara	0.00	Q	Sarighat	Sarighat discharge used here as catchment is adjacent and the same size as Lubhachara catchment.
Manu	0.00	Q	Manu RB	
Mogra	0.00	Q	Q=2	NAM catchment NE-06
Naleya-AT	0.00	Q	Q=10	NAM catchment NW-10
Nandakuja	39.39	Q	Q=10	NAM catchment NW-39
Nawagang	0.00	Q	0.05*Lourergorh	Scaled discharge
O Someswari	0.00	H	Durgapur	Spill channel of Shibganjdhala at Durgapur. Runoff from NE-10 intercepted by LB floodplain (below)
O_Som_LB	0.00	Q	Q=10	NAM catchment NE-10
Sarigo_RB	0.00	Q	Q=10	NAM catchment NE-18
Sarigowain	0.00	Q	Sarighat	
Shibganjdhala	6.5	Q	Durgapur	
Sib-Barnai	9.65	Q	Q=0	NAM catchment NW-32U
Sonaibardhal	0.00	Q	0.089*Barak	Scaled discharge
Surma_RB	0.00	Q	Q=2	NAM catchment NE-19
Teesta	79.79	Q	Kaunia RB	
Tulshiganga	0.00	Q	Q=10	NAM catchment NW-27
Ukaratoya	41.5	H	Panchgarh	
Ukaratoya	42.00	Q	Q=10	NAM catchment NW-2
Up Khowai	0.00	Q		NAM catchment NE40

4.5 Rating Curves

Rating curves are available at several real time stations in the NE and NW. They are used to generate inflows to the Super Model. This is done automatically in the Flood Watch database (see Section 8). The rating curve equations presently implemented in Flood Watch are listed in Table 4.

Table 4. Rating Curve Equations Used in the Super Model

Station	River	A	N	Ho
Amalshid	Barak	1.21 992	2.97 1.15	2.22 (h<16) 13.5 (h>16)
Badarganj	C.Jamuneswari	20.39 130.44	2.72 1.52	27.5 (h<29.5) 28.45(h>29.5)
Durgapur	Shibganjdhala	33.42	2.67	9.51
Kaunia RB	Teesta	148.98 199.39	2.07 2.96	26.40 (h<28.5) 27.00 (h>28.5)
Lourergorh	Jhadukata	238.86	1.96	6.8
Manu RB	Manu	10.20	2.27	11.80
Nakugaon	Bhugai	30.50	1.93	20.10
Panchagarh	U.Karatoya	41.21 57.40	2.32 2.00	67.10(h<67.8) 67.25 (H>67.8)
Sarighat	Sarigowain	0.58 0.27	2.86 4.22	1.76 (h<8.5) 4.00 (h>8.5)

4.6 Flood Plains

Flood plains are schematized in the Super Model in various ways; as extensions to river cross sections, as flood cells and as separate flood plain channels. Flood cells and flood plain channels are connection to the adjoining river system by a series of *Link Channels*. Link channels simulate the exchange of flows between the rivers and flood plains, via overtopping of embankments and drainage back via khals. There are a total of 207 link channels in the model.

4.7 Embankments

River embankments are common in the NE and NW regions and along the banks of the Ganges and Jamuna. Embankments, including railway and road formations prevent or impede the exchange of water between the rivers and floodplains. They are taken into account in the model via the link channels mentioned in the previous section. Embankments also play an important role in flood mapping, where they act as discontinuities in the water surface. See Section 10.

4.8 Structures

Structures in the Super Model comprise Broad Crested Weirs (35) and Culverts (15). BC weirs are generally used to simulate flow between rivers and flood plains. In the NE, several BC weirs on the Kushiyara RB floodplain represent constrictions where flood waters pass under, or over main roads. Weirs are also used to regulate spill flows from the Jamuna to both left (NC) and right (NW) banks. See also Section xx.

4.9 Naming Conventions

River Names

As far as possible, actual river names have been used in the model according to SOB topo maps and other authoritative sources. Deviations from this have been necessary where the original river models have been extended upstream. eg, the Surma, Kushiyara and Khowai have all been extended upstream, as the original starting chainage was zero, the extended branches are prefixed with the term "Upper" to prevent the use of negative chainages.

Flood Plain Channels

Where floodplains are separated from the main river channel, a quasi 2-D model schematization has been adopted, with the flood plain modelled as a separate river branch, joined to the main river by a series of links. The floodplain channels are named after the river they are linked to (abbreviated if necessary), with the suffix "_LB" or "_RB" used to describe their location on either the left or right bank of the river they are named after.

Example

The right bank floodplain of the Kaliganga River is designated KALIGANGA_RB

The left bank floodplain of the Old Someswari river is called O_SOM_LB

Flood Cells

Flood cells have been used to describe areas which are subject to inundation, but in which water flows are very small or zero. Such areas include many of the *haor* depression areas in the north east which are protected from early flooding by dwarf embankments, but which become submerged later in the monsoon. The water levels in each of these areas can be assumed to remain nearly horizontal, and therefore a flood cell description is the most appropriate.

Flood cells are in most cases connected to the adjacent rivers by link channels. Incorporated within each link is a structure description (an open culvert) which regulates the flow exchange between the flood cell and the river. The area-elevation relation of the flood cell is given at a *single* cross section in the cross section database. Links which incorporate the A-E relation of a flood cell in the cross section database are easily identified from the .RDF listing of the link channels, as the *Fl. Area End* is non-zero.

The naming convention used for the link channels is described below. In a few cases, river branches with broad crested weirs are used to describe the connection between the river and flood cell. This is generally where the flood cell is connected at one end only, and a boundary (Q=0) is specified at the open end.

Links

Links have generally been used to connect floodplain branches and flood cells to the main rivers. The naming convention followed is:

ABCDEF_*Xnnn*

Where

ABCDEF are the first 6 letters of the river branch the link is connected to

X ***is either L or R, depending on whether the link is on the left or right bank of the river***

nnn is the chainage (rounded down to the nearest 1 km) of the river/link connection. The chainage field should be preceded by zeros if the chainage < 100.

Examples

A link connecting the right bank floodplain of the Kushiyara River (KUSHIY_RB) to the river itself at chainage 8.5 is designated as KUSHIY_R008.

A link connecting the right bank floodplain of the Dhaleswari River (KUSHIY_RB) to the left bank of the Padma at Ch. 61.0 is designated as PADMA_L061.

Note that in the North East region, a slightly different convention has been used in the case of links which join to either end of a floodplain channel. In these cases, the actual floodplain channel name has been given to the link itself.

Example

The BAULAI_LB floodplain channel runs from Ch. 2.7 to 85.7 almost north-south along the left bank of the Baulai between the Baulai and Old Surma/Kalni rivers. The floodplain channel is connected at the upstream end via a short link to the left bank of the Nawa River at Ch 13.0. Similarly, the floodplain channel is connected via another link at its downstream end to the Upper Meghna at Chainage 0.0. The upstream link has been designated BAULAI_LB, extending from ch. 0.0 to 2.7, and the downstream link has been called BAULAI_LB extending from ch. 85.7 to 93.1.

One other exception to this naming convention concerns the case where a link does not connect to a river, but connects a floodplain to another link. In this case, no river chainage can be used as a reference. In such cases, the floodplain name is used, followed by the letter "B".

Example

The link connecting the floodplain channel SURMA_RB to the flood cell link SARIGO_L015 is designated SURMA_RBB

Note that except in the cases cited above, the upstream end of all links have been connected to the river side, and the downstream has been connected to the floodplain channel. *This means that positive flow in a link means flow from the river to the floodplain, and negative flow means flow from the floodplain to the river.*

4.10 Special Features

Breaches

There are several locations in the model area where breaches in embankments regularly occur. The present model reflects the position of the breaches at the end of the 1995 monsoon, as far as information allows. It may be necessary, during the course of a forecasting season, to modify the model setup to reflect changes in the actual breach locations and geometries. Known breach locations are described in Table 4.

Scaled Boundaries

In most cases where real time data is not available to provide input at the model boundaries, the output from a NAM catchment is used. In the North East region however, there are many inflow boundaries along the border areas with India. NAM simulations from these catchments, which lie mostly within Indian territory, are not reliable as there is no rainfall data available within the catchment areas. Therefore, a different approach is used. Along the northern border, real time water levels are available at:

- Amalshid
- Lourergorh (not yet on line)
- Durgapur
- Nakugaon
- Manu RB

The discharge at model inflow points from neighbouring catchments is estimated by scaling the discharge in accordance with the relative catchment areas. Table 5 shows the resulting scaling factors which are applied. These may need to be modified if it appears that the resulting discharge is consistently too high or too low.

The use of discharge as opposed to water level boundaries at locations where the local river topography is not well defined (large cross section spacing) may lead to an improvement in the model accuracy. There are several boundaries in the north west which may benefit from switching from a water level to a discharge boundary.

Table 4. Breach Locations and Details

Region	Breach location	Model branch or link name(s)	Present status and comments
NW	Bramaputra Right Embankment (BRE)	BREACH-2 BREACH-3X BREACH-4X BREACH-5X BREACH-7X	These are more or less permanent features of the BRE, and are not usually repaired. Careful monitoring should be kept of the situation around Mathurapura, where a complete breakthrough to the Bangali river is imminent. If this occurs, flood levels along the Bangali and .. Rivers would increase dramatically.
NE	Surma LB and Kushiyara RB	U_KUSH_R025 U_SURM_L042 KUSHIY_R008 KUSHIY_R041 KUSHIY_R067	Embankment breaches along the Surma LB and Kushiyara RB occur regularly. These spills flows into the floodplain channel KUSHIY_RB, which runs from Amalshid all the way to Markuli. In 1993, flow measurements at several places along this floodplain indicated that it took 40% of the total Kushiyara flow.
NC	Jamuna LB	SPCHANNEL1	This spill channel was closed together with the Old Dhaleswari offtake before the 1995 monsoon for the construction of the Jamuna bridge. High water levels in the Jamuna in July 1995 reopened this spill channel. With the Old Dhaleswari off take remaining closed, the hydraulic gradients in this channel were higher than ever before. This has resulted in the rapid widening and deepening of this channel from July 1995 to the end of the monsoon (depth increased from 3 to 8.5 metres) This enlargement process will probably continue during 1996. Flows through this channel dictate the flows and water levels in the Pungli-Bangshi, and to a lesser extent the Louhajang rivers. It appears at present that flow in this channel are severly constricted. A BC weir is located at Ch.0.5 with crest level 11.0m PWD to represent this constriction.
NE	Manu Project (Manu RB)	MANU_R028 MANU_R054	Breaches of the flood protection embankment surrounding the Manu project are a regular occurrence, but are repaired at the end of each monsoon.. The present model setup uses two links to represent spilling into and drainage from the project area. At present, the bed level of these links is high, assuming the breaches are repaired. If news of new breaches is received during the monsoon, the bed levels and widths should be adjusted accordingly.

The use of discharge as opposed to water level boundaries at locations where the local river topography is not well defined (large cross section spacing) may lead to an improvement in the model accuracy. For this reason Kaunia RB is now defined as a Q boundary.

Tides

Tidal variations in water levels in the Bay of Bengal are sufficient to penetrate up to and beyond the Super Model downstream water level boundary at Chandpur, even in the monsoon. Water level variations here reach as far as Dhaka. Previously, only LWL, MWL and HWL were recorded, and furthermore, no prediction is made of the water level variation in during the forecast time.

To improve this situation, hourly water level recording at Chandpur has been initiated. A prediction tool (possibly an ANN) is needed to make predictions ofr the next 72 hours.

Bench Mark Corrections

As a result of the second order survey of the north east region carried out jointly by SoB and FAP6, a large number of corrections have been made to SWMC's North East Regional Model. Both the cross sections used in the model and the water levels used for boundaries and comparisons have been adjusted according the survey results. As the north east component of the SuperModel is based on the NERM, these BM corrections have also been incorporated. A list of the BM corrections applied to hydrometric stations in the NE is shown on Table 6.

Note that BWDB have **not** yet incorporated these corrections in their hydrometric network. This means that water levels coming from the following RT stations in the NE need to be corrected before being used as RT boundaries or update points. Note also that the rating curves have yet to be modified to reflect these BM corrections. Therefore discharges need to be generated using the uncorrected water levels.

Table 5: Scaling Factors Used for computing Inflows at NE Boundaries

Boundary	River	Catchment Area A1	Scaled From:	Catchment Area A2	Scaling Factor A1/A2	Comments
Borogram	Lubhachara	771	Sarighat	840	0.92	Use 1.0 in practice
Chelasonapur	Active Chela	0.66*431	Lourergorh	2399	0.12 **0.15 used**	Chelasonapur and Urugaon share the same catchment (431 km^2). Chelasonapur takes approx. 2/3 of the total flow, the remaing going to Urugaon
Islampur	Dhalagang	340	Lourergorh	2399	0.14 **0.25 used**	
Jafflong	Jafflong	0.50*1003	Sarighat	840	0.60	Jafflong and Ratnerbhanga share the same catchment (1003 km^2). The flow split is about 50/50.
Jaldhup	Sonaibardhal	2256	Amalshid (Kushiyara plus Surma flows)	25265	0.089	Total catchment area above Amalshid is for the combined Kushiyara-Surma flow. Need to make a combined RC for the Barak.
Kamalganj	Dhalagang	774	Manu RB	2367	0.33	
Ratnerbhanga	Active Piyangang	0.50*1003	Sarighat	840	0.60	
Urugaon	Nawagang	0.33*431	Lourergorh	591	0.059 **0.05 used**	
Dulura	Jhalukhali	591	Lourergorh	2399	0.25 **0.50 used**	SF based on catchment areas gives too low discharge.

Table 6. Stations where BM corrections are Required

Station	River	Boundary /Update	WL/Q	BM corr	Comments
Bhairab Bazar	Upper Meghna	Update	WL	-0.07	
Durgapur	Shibganjdhala	Boundary	Q on Shibganjdhala, WL on O_Someswari		Make correction after generating discharge
Habiganj	Khowai	--	WL	-0.35	Forecast without update
Jariajainjhal	Kangsha	Update	WL	-0.15	
Kaniaghat	Surma	Update	WL	+0.19	
Lourergorh	Jadukata	Boundary	Q	+0.33	Make correction after generating discharge
Manu RB	Manu	Boundary	Q	+0.18	Ditto
Sarighat	Sarigowain	Boundary	Q	+0.46	Ditto

4.11 Present Status (June 1997)

The updated Super Model has been installed on PC104 under `m11_32\data\all-97`. The model setup in this directory uses ALL the real time data which are expected to become available during the current monsoon. At present, the following data are **not** available from any source:

Station	Region	WL	RF
Jagir	NC	x	(Out order)
Bogra	NW	x	x (RF is collected, but not used)
Nakugaon	NE	x	x (Not yet installed)
Lourergorh	NE	x	x (Not yet installed)
Jariajanjail	NE	x	x (Not yet installed)

As a consequence of the above, the setup files in ffwc97-all have been modified to use only data available at the present time. The modified setp may be found in `m11_32\data\ffwc`. The main changes to the files are as follows in Table 7.

Table 7. Temporary Changes made to Complete Super Model Setup Files

Complete Setup File	Modified Setup File	Modifications
SM97-ALL.RDF	SM97-TMP.RDF	The following NAM connections are included to take into account missing boundaries at Nakugaon and Lourergorh. Note that Lourergorh is also scaled to provide discharge boundaries at another 4 model boundary points. NEX-48 -2399 km^2 @ JADUKATA 0.0 NEX-01A - 340 km^2 @ DHALAGANG 0.0 NEX-06 - 314 km^2 @ ACTIVE_CHELA 0.0 NEX-06 - 116 km^2 @ NAWAGANG 0.0 NEX-11 - 591 km^2 @ JHALUKHALI 0.0
SM97-ALL.BSF	SM97-TMP.BSF	The HD boundary file has been modified to take into account missing boundaries listed above. The following discharge events have been replaced with a contant discharge (Q=2 or Q=10) LOURERGORH @JADUKATA 0.0 LOUR-JHALU @ JHALUKHALI 0.0 LOUR-DHALA @ DHALAGANG 0.0 LOUR-CHELA @ ACTIVE_CHELA 0.0 LOUR-NAWA @ NAWAGANG 0.0
SM-ALL.MSF	SM-TMP.MSF	The following rain stations have been removed from the .MSF as real time data are not currently available: (Weightages from currently available stations have been altered to compensate) Lourergorh Nakugaon This affects catchments in the NE only.
SM.NSF	SM.NSF	No change
SNNAM.BSF	SMNAM.BSF	No change
SM97.SSF	SM97.SSF	No change
SM97.PST	SM97.PST	No change
SM-ALL.USF	SM-TMP.USF	The following update stations have been removed due to unavailable data: Bogra Jagir

Generation of Hotstart file for the 1997 Monsoon

The 1997 model was initially run without updating from 5.5.97 to 20.6.97. Data for Sarighat and Phulbari did not become available until mid June. Therefore the hotstart file was created using NAM boundaries where there data were required (Sarihat Q is also scaled for input at several other boundaries). The specific files used for the hotstart run were SM-HOT97.RDF and SM-HOT97.BSF (HD). All other files are as listed above in Modified Setup. The result file, SM-HOT97.RRF was then used for further simulations from 20th June using the then available Phulbari and Sarighat boundary data.

4.12 Future Improvements

At present, the NW component of the Super Model utilizes only a small number of the possible real time rainfall data in the area. A reason for this was that when existing BWDB water level stations were proposed to be upgraded to real time stations, a check was not made on whether the station also recorded rainfall. A later check revealed that several stations do indeed record rainfall, and that therefore this data could also be reported in real time for use in the model. The stations in question are:

1. Serajganj
2. Chapai Nawabganj
3. Badarganj
4. Mohadevpur
5. Rohanpur

If it is seen that regular rainfall is received (as requested) from these stations, then the Theissen weigtages for the NW catchments should be modified to include these new stations. This task has been assigned to Kamal at SWMC. He will aslo recalculate the weightages for all other catchments in the model as a second check of the existing weights. It is proposed that all Thiessen polygon calculations be carried out using the special facilities in Arc/Info, so that, if future changes in data availabiliy occur, new weights may be computed rapidly. The new weightages should be made ready for inclusion in this year's FF activities as soon as possible.

5. The Flashy River Models - NE and NW

The flashy river models are implemented on pc101. Setup files for the NE and NW models are located under `c:\m11_32\data\ne-flash` and `c:\m11_32\data\nw-flash`. Full details of the model setups and data requirements may be found in HRS's report.

6. The Flood Watch Database for the SuperModel

6.1 General

The Flood Watch database for the Super Model is implemented on pc104 under `c:\fap10\data`. Data entry, plotting and processing tools and configuration files are located in `c:\fap10`. Data is entered into the database from the databoxes automatically. Data from voice radio are then entered manually, and, at the present time, telemetry data required to run

the model are also entered in this way (Nayerhat, NC and Sherpur, NE). Auto transfer of telemetry data is not operational at present.

6.2 Changes to the Flood Watch Database Setup, June 1997

Changes made to the Flood Watch database configuration during June 1997 have been mainly to add new real time stations and sensors, and also to add raw databox water level and rainfall sensors where unprocessed databox data are stored. Database modifications were made via the **dcfg.exe** utility, specifying the configuration file **c:\fap10\data\ffwc.dis**.

Appendix B list the entire database sensor setup of the Super Model flood watch database.

6.3 Database Entry

At present, databox data are coming in from only a few stations, and these are mainly water levels. Rainfall data is scrambled and it is not clear in which units the rainfall is measured and/or transmited. The proposed field trip by Noorullah is aimed to unify the databox data entry procedures.

In the meanwhile, an interim data entry procedure has been developed. First, databox water levels for those stations for which voice data are not available are pre-processed and transferred to the database, and then the remaining voice water levels and rainfall data are entered. Pre-processing of databox data is explained in the following section. Manual data entry of voice data, and further processing is described in Section 7.

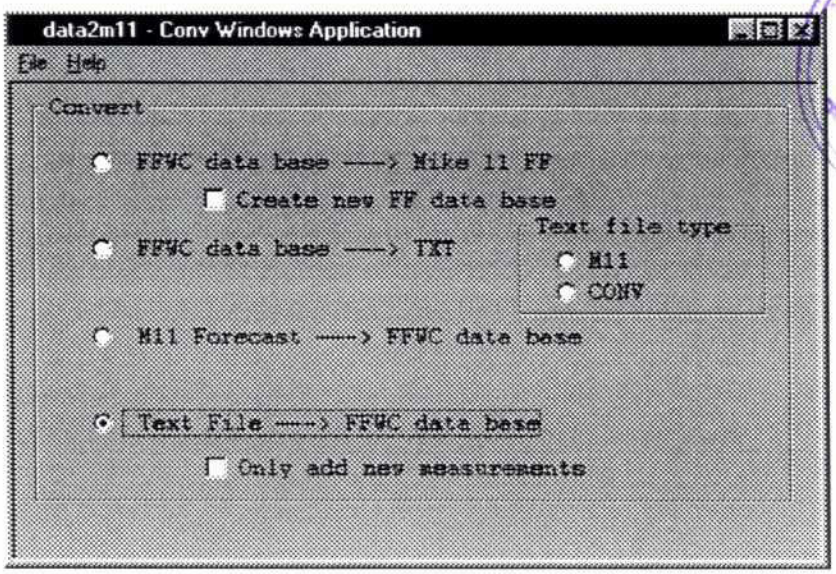
6.4 Preprocessing of Databox data (Magic1 - 6)

Data received from the databoxes must be preprocessed before entry into the FloodWatch database. A series of batch files have been established to automate this process. The batch files, named **Magic1.bat** - **Magic6.bat** may be executed for the Super Model from the desktop folder, *Magic*, which contains the shortcuts to each batch file. Batch files are located in **c:\fap10\bat** on **pc104**. Configuration files are located in **c:\fap10\magic**. A full description and listing of each batch file is given in ANK's documentation.

Magic1.bat Copies the databox data files ***.all**, from **pc100**, and, via the **box2conv.exe** program, sorts and reformats the data into a file named box2conv.cnv file ready for transfer to the Flood Watch database. The **box2conv.exe** program carries out very basic QA checking; data with

times later than the present time are ignored, and data with invalid dates (eg 1997 06 83 06 00) are ignored. At the same time, the `*.all` files on **pc100** are moved to a backup directory. Hence the next time **`magic1.bat`** is executed, only new data are copied.

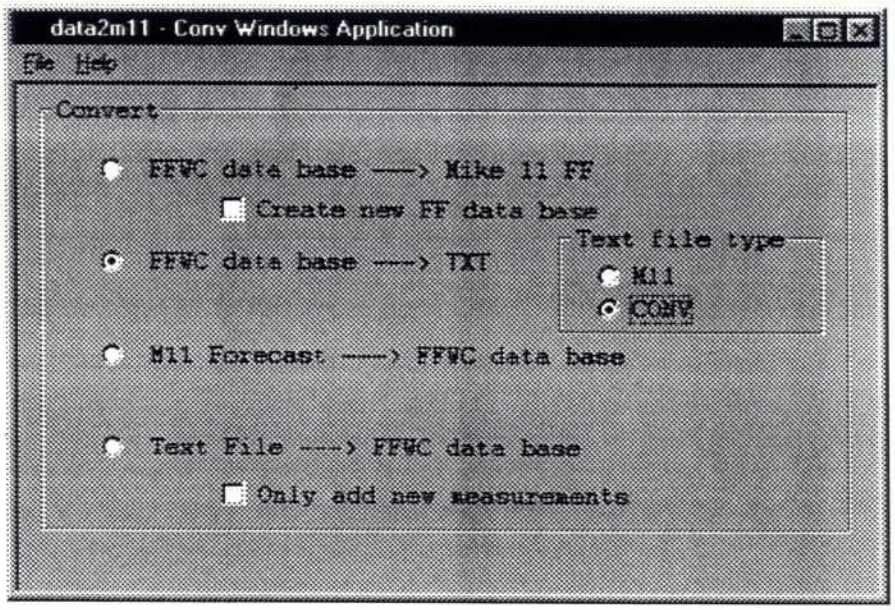
`Magic2.bat` Starts the conv.exe program to read the raw data text file into the FW database, as shown below. The file `magicnv2.cnv` is used as an argument. Data are read into sensors named *Raw Databox WL* or *Raw Databox RF*.



`Magic3a.bat` Starts the entry.exe program with the file `ffdrf.ini` as an argument. This displays all raw databox rainfall. The .ini file specifies **DAY=DB**, which implies that all available raw data will be shown on the entry form. At this stage, the data should be plotted using *Quickplot*, and corrected (or deleted) as necessary.

`Magic3b.bat` As **`magic3a.bat`**, except raw databox water levels are displayed using the file `ffdwl.ini` as an argument. All data should be plotted using *Quickplot*, and corrected (or deleted) as necessary.

`Magic4.bat` This starts **`conv.exe`** again. The data are exported to a TXT file named `ffwc2cnv.txt` using `magicnv2.cnv` again as an argument to the program. Export the file as a conv file by selecting the appropriate button as shown:



Magic5.bat The exported data are processed as follows:

Rainfalls: Rainfalls are accumulated to to daily values. Depending on the measurement frequency, the time search interval for each rainfall measurement varies. A total of 7 different search schemes have been devised for maximum flexibility. The required accumulation scheme is specified in the file `magicnv2.cnv` via the `InterpolationMethod` parameter. ***Appendix D*** lists the rainfall accumulation and water level interpolation schemes.

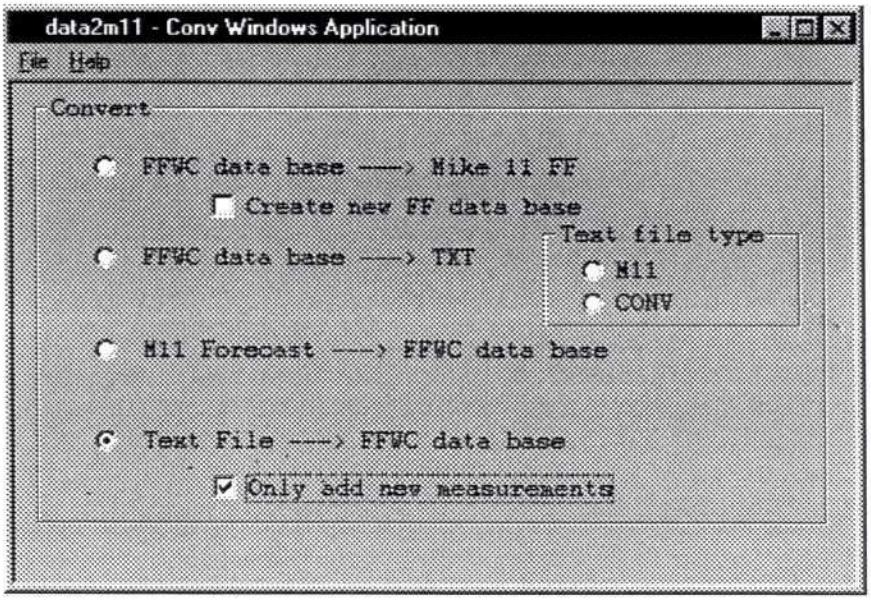
Water Levels: Water levels are interpolated to the required times, generally every 3 hours from 0600-1800. Exceptions are, Flashy NE, Flashy NW and 24 hourly stations. As for rainfall, the type of interpolation will vary for each type of data, and the required scheme is specified by the `InterpolationMethod` parameter in `magicnv2.cnv`.

The interpolation program is named **`ffintp.exe`**. Note that by default, the program interpolates only data from 0600 six days ago to 0600 the present day (the usual duration of the updating in MIKE11). The default input file name is `ffwc2cnv.txt`, and the default output file is `ffinterp.txt`.
If a different duration is required, the program must be run with all command line arguments, ie: *`input-file; output-file; start-date; stop-date`*.

Appendix C lists the rainfall accumulation and water level interpolation schemes, and also the contents of `magicnv2.cnv`.

`Magic6.bat` After the water level and rainfall data have been accumulated/interpolated, they are read into the FW database into the same sensors as the voice data. The program **`conv.exe`** is normally used with the file `magicnv6.cnv` as an argument and `ffinterp.txt` as the input file. However, as the rainfall data are still scrambled, a modified `.cnv` file, `magmod6.cnv` has been created which only lists water level data for transfer to the FW database. This should be used until databox rainfall data reaches the required standard. (The **`magic6.bat`** file will then need to be modified to specify `magicnv6.cnv` as the program argument)

IMPORTANT! *In order not to overwrite any existing voice data, the option "Add only new data" must be checked as shown below.*



After these steps have been carried out, the usual data entry procedures outlined in the Section 8 may be carried out.

7. The Flood Watch Database for the Flashy River Models

7.1 Database Setup

The database for the flashy river models is located with the models themselves on pc101. The database and associated configuration files and batch files are located under **`c:\flashy`**. This database is kept separate

from the Super Model Database on pc104, although sensor names and directories are the same where common sensors exist.

7.2 Changes to the setup, June 1997

Some changes have been made to the setup, in particular the introduction of *Processed* and *M11Update* sensors to hold temporary boundary forecasts and estimated update data respectively.

7.3 Preprocessing of Databox data (Magic1 - 6)

This is done in much the same way as for the Super Model. The difference is mainly in the first step. The extraction of the databax data must fiirst be carried out on pc104, during which the *.all files are converted to the output file box2conv.cnv. Then, magic1.bat on pc101 (the flashy river PC) simply copies that file to its own magicbox data directory, c:\flashy\magic. Thereafter, steps 2-6 are similar. Steps 3a and 3b (QA check of RF and WL data) have been merged into a single Step 3.

7.4 Database Entry

After the databox data have been transferred to the flashy database, additional tasks such as voice or telemetry input are carried out for each model separately. Note that the Flood Watch configuration files are stored in the MIKE11 working directory for each model, as mentioned in Section 5.

Note All Magibox preprocessing, data entry, checking and flood bulletin generation can be carried out from within the subfolders in the "Flashy" folder on the pc101 Desktop. Magicbox pre-processing is a common task to both models . Subsequent activities are carried out on each model separately. Just enter the appropriate subfolder for the necessary shortcuts.

8. Flood Forecasting with the SuperModel

8.1 Introduction

After the databox data have been processed and entered in the FW database (see Section 6), the usual additional data entry and processing steps should be carried out, as described in the following sections. Note that all the steps described below may be carried out from within the Flood Watch ArcView Interface. With the fap10.apr as the active view, the buttons numbered 1 to 6 automatically start the required programs with the correct arguments. The programs may also be started from the

shortcut icons in the "Flood Watch" icons on the Desktop of pc104. All `.exe` and configuration files listed below are located in `c:\fap10` on **pc104**. (A backup is made daily to **pc101** via the *System Agent* setup on **pc104**)

8.2 Step 1: Water Level Entry

Water levels from stations from which databox data are not available must be manually entered in the form `levels.rts` which is loaded with the entry.exe program in this Step. After completing the data entry for all stations, *Quickplots* are taken to check for punching errors. Data from two telemetry stations, Nayerhat (NC) and Sherpur (NE) must also be manually entered at present as the automatic transfer of telemetry data is not operational.

8.3 Step 2: Rainfall Data Entry

As databox rainfall data are not sufficiently reliable at present, all rainfall data must be manually entered from the voice radio records. Button no. 2 in the Flood Watch interface loads entry.exe with the file `rains.rts` as the argument. After completing the data entry for all stations, *Quickplots* are taken to check for punching errors.

Note: An overview of all available water level and rainfall data may be seen by clicking on the *WL Availability* and *RF availability* icons in the "Flood Watch" folder on the Desktop. This plots all real time data from the measured water level and rainfall sensors (ie shows processed magic box data and manually entered voice and telemetry data)

8.4 Step 3: Process Data

i) The data are then processed using the **`proc.exe`** program, and the file `bounds.pro` as an argument (Button no. 3). All processing parameters are stored in the file `bounds.pro`. During processing, the following actions are carried out:

ii) BM corrections are carried out to the stations listed in Table 6. The corrected water levels are inserted into sensors named *Processed WL* (if a boundary) and *M11update WL* (if an update station)

iii) Discharges are calculated for the boundaries shown on Table 3. Discharges are inserted into sensors named *Processed Q*. The discharge calculations are based on

uncorrected water levels, as the rating curves used do not take BM corrections into account.

iv) The above discharges are are scaled to provide discharge boundary conditions to numerous ungauged inflows in the North East. Discharge boundaries and scaling factors are listed in Table 6. Scaled discharges are inserted into sensors named *Processed Q*.

v) Data at water level boundary stations are copied into temporay sensors named *Processed WL*

vi) Data at update stations are copied into temporary sensors named *M11update WL*

vii) All measured rainfall are copied into sensors named *Processed RF*.

8.5 Step 4: Estimate Boundaries

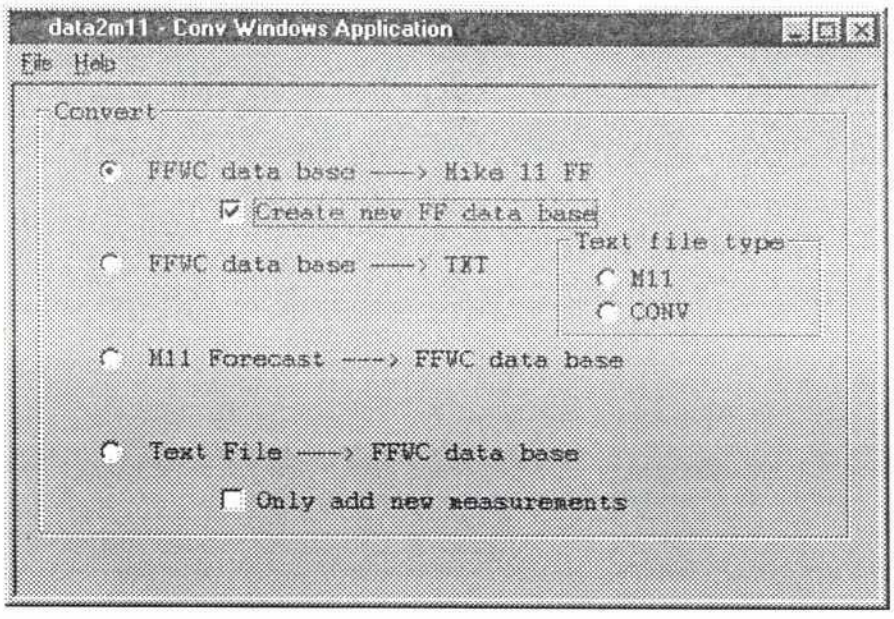
Estimates of boundary conditions (water levels, discharges and rainfall) are then made via the **entry.exe** program using the file as an argument parameter. The data listed in the entry form are the Processed water levels, discharges and rainfalls computed in the previous step. Estimates of the necessary data for the next 72 hours are then added to these sensors via the form, at 24h intervals.

8.6 Step 5: Check of Update Stations

Finally, a check that data is available at all updating stations is made via **entry.exe** using the file `update.chk` as an argument. The form displays processed water levels at all updating stations. Data must be available at all updating stations at 0600 and 1800 every day the updating is carried out (generally from 6-8 days previous). If any data are missing, they are estimated and stored in the Processed WL sensors.

8.7 Step 6: Transfer Data to MIKE11 FF Database

The processed water level, discharge and rainfall data are then transferred to the MIKE11 FF database using the **conv.exe** program and the file `data2m11.cnv` as an argument. The destination directory is **c:\m11_32\ffwc**, as shown in the `.cnv` file. The option "Create new FF data base" should be checked as shown.



Databases created in MIKE11 are:

- `WL.BST` -Processed water level and discharge data upto the time of forecast
- `RF.BST` -Processed rainfall data up to the time of forecast
- `QPF_BASE.BST` -Processed boundary water level and discharge data and rainfall up to the time of forecast and estimated data during the forecast period.

Note that the database `EMPTY.BST` must exist in the MIKE11 destination directory before executing **`conv.exe`**.

8.8 Running the MIKE11-FF model

The data directory for the updated MIKE11 model is **`c:\m11_32\ffwc`** on **pc104**. The setup files are listed on the Table in Section 4.11. Until all stations comes on line, the modified setup files as listed on the table should be used.

The model is generally run from between 6-8 days previous, to 3 days in the future. The NAM timestep is 24 hours, and the HD timestep is 60 minutes, with results saved every 24 hours. The previous days NAM and HD result files are used to hotstart MIKE11 on the day of forecast. The HD result file name, `SM.RRF` is used in the file `data2m11.cnv` during transfer of data back from MIKE11 to the FW database (see section 8.9). Therefore care needs to be taken if changing the name. To avoid

corruption of the previous days HD result file, it is suggested to rename it to say `SM-1.RRF` after each MIKE11 simulation.

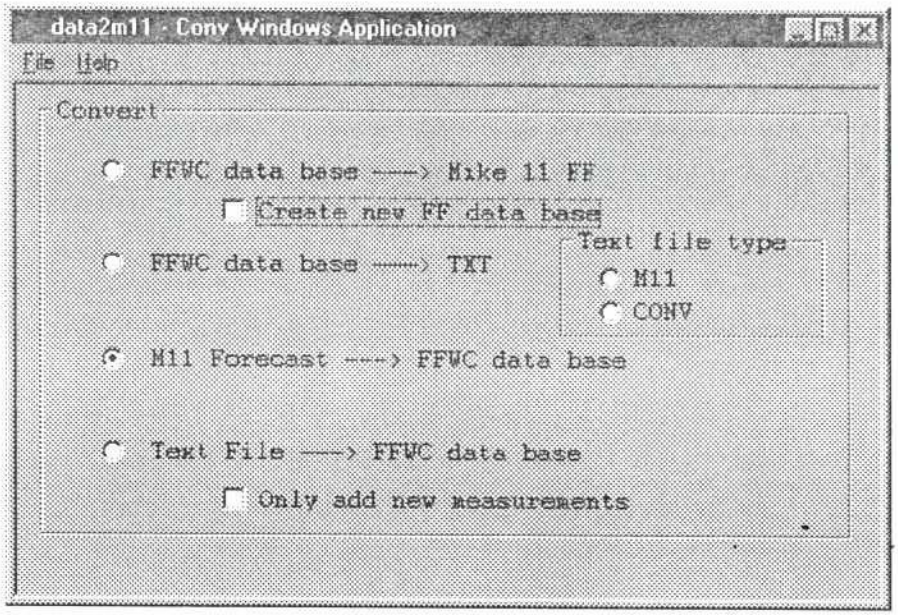
At the present time, two stations have been removed from the updating specifications due to stability problems, these are **Mohadevpur** and **Bhairab Bazar**. Mohadevpur is a flashy station on the Atrai. Much of the discharge is generated from NAM runoff. In the early monsoon, the NAM generated discharges may be inaccurate. At present the model is oversimulating the water level at Mohadevpur by 1.5-2.0m. Trying to update on such a large error is not possible.

The water level at Bhairab Bazar in the early monsoon is dependent on the initial consitions specified in the floodplains of the NE region. As these are generaly unknown, it takes some time for the model to adjust to inacurately specified IC's. This is particularly the case at this station, as the huge retention area lies just upstream of the station, and this takes enormous volumes of water to fill. Consequently, trying to update at this station also poses problems due to the large volumes of water needed to alter the water level at this station.

Foe the above reasons, both these stations have been temporarily removed from the updating file, which has been copied to a new file named `BBAZ-MOH.USF`. This should be used until simulated and observed water levels at these two stations are closer.

8.9 Transfer of Model results to FloodWatch Database

After a model simulation, the results are transferred to the FW database in a reverse operation of Step 6. In the Arcview interface, the same button may be used. In **`conv.exe`**, click on the selection "MIKE11 Forecast → FWFC Database" as shown. The file `data2m11.cnv` is again used as the argument.



8.10 Issuing of Bulletins

The existing bulletins have been updated to include the new real time forecast stations. Three bulletins may be produced from within the ArcView GUI or from the associated icons in the "Flood Watch" folder on the Desktop.

Observations Bulletin (`bull.exe observed.bul`) – Bulletin of observed WL and RF in the last 24 hours
Forecast Bulletin (bull.exe `forecast.bul`) – Bulletin of forecast water levels for the next 72 hours
Rise and Fall Bulletin (`bull.exe fore-r&f.bul`) – Bulletin of forecast rise and fall at forecast stations for the next 48 hours.

9. Flood Forecasting with the Flashy River Models

To date, flashy flood forecasts have not been made as same day data (at 6.00 and 9.00) is not being transmitted. Part of Noorullah's task will be to ensure timely transmissions of flashy river data.

10. Flood Mapping

10.1 Flood Mapping Setup

Flood mapping of the Super Model Results is carried out on PC 104. Double click the "Flood Mapping" icon in the "Flood Watch" folder on the desktop. This starts ArcView 3.0 and automaticaly loads the flood mapping project file, `sm-fmap.apr`.

When loading the M11-GIS, the user is prompted for the location of several setup files. The only files that should be changed are the location of the MSD directory. At present flood mapping from a FF simulation is not possible. The present MDD and MSD directories are a trial flood map of the 1995 monsoon. When flood mapping from the Super Model is started, the MSD directory should be changed to c:\m11_32\data\ffwc\SM.MSD, assuming the result file is named SM.RRF. The MSD is created automatically when specifying M11GIS_OUTPUT=ON in the file `c:\m11_32\run\mgisvar.inp`. The MDD must be created by the user from Menu A.8 in MIKE11.

Unless changes are made to the RDF which affect the chainage of computatonal points (inseting/deleting x-sects, structures, or changing dx-max) then the existing MDD should remain valid. If changes are made, a new MDD must be created, and the location of h/Q points must be recalculated in M11-GIS (BRS Menu).

In the present ArcView project file, `sm-fmap.apr`, the h/Q points have already been calculated based on SM-97TMP.MDD, and these should not have to be recalculated. Therefore, to make a floodmap from a FF simulation the steps are as follows:

1. Import the MSD by clicking the wave icon on the button bar.
2. Create the flood map from the FM Tool/Inundation Map menu selection.
3. Select Dynamic and User Defined CBL

The flood map may take between 60-80 minutes to generate. You should shut down as many unused other processes as possible during this time.

After the flood map is generated, select the icon to display it.

10.2 Calculating the Thana Warning Status

After the flood map has been generated, load the thana coverage theme thanas_.shp. Then calculate the Thana warning status by clicking the multicoloured right hand icon. Thanas to be included in the calculation (265 in total) have already been selected and saved in a file named thanasel.txt, so load this file at the system prompt. The calcuation takes around 5 minutes. The status bar displays the Thana presently being processed. The status is displayed after the calculation. The following parameters have been used:

Status	Colour	Inundation
Normal	White	0-15%
Danger	Yellow	15-30%
Severe	Orange	30-50%
Extreme	Red	>50%

Colours and status names may be changed id required. Double click the legend and make the changes. To save the changes, save to a file named `F10stat.avl`. If the number of classifications is changed, changes will need to be made to the Avenue script.

Two Avenue scripts are used for the calculation, Thana_stat.calc and Thana_stat.def, the latter is a subroutine to the former. They may be examined from the script editor in the sm-fmap project.

10.3 Files used in Flood Mapping

The main files needed to produce flood maps are located in pc104 under **`c:\dhi\m11gis\sm-fmap`**. A backup of this directory exists on pc101 under **`c:\dhi\m11gis\sm-fmap backup`**. If for any reason the flood mapping setup on pc104 gets corrupted, delete the entire directory **`sm-fmap`**, and copy the backup (rename to **`sm-fmap`**) from pc101.

If this fails, the entire DEM and flood mapping setup will need to be done again from scratch. The raw data and theme files are located on pc101 under **`c:\dhi\m11gis\f10-thm`**. This directory contains the raw xyz file (`dem900m.xyz`) and the `sm-fm.inp` file for creating the DEM, plus the mask, BRS and fault themes for making the floodmaps Also contained in this directory are a number of other useful themes (incl AutoCad drawings) such as thana coverage, detailed regional rivers (ACAD), coasts, M11 shematizations (ACAD), roads and railways. All files in this directory are write protected, so copy the files to where they are needed and remove the protection.

If starting from scratch, copy the M11-GIS project file, `c:\dhi\m11-gis\setup\m11gis30.apr` to the new project directory, rename it `as sm-fmap.apr`. The directory also contains the text file versions of the two thana status calculation scripts, Thana_stat.calc=`tha-cal.ave`; Thana_stat.def=`tha-def.ave`. The icon bitmap is thanastat.bmp. If a new `sm-fmap.apr` is created, these two scripts will need to be read in and named, and a new button assigned to call the script Thana_stat.calc. Use the `thanacalc.bmp` as the icon.

Appendix A

The Flashy River Flood Watch Database Sensor Setup

C:\FLASHY\DATA\0019\0001\:	Punarhaba at Dinajpur -3 hourly WL
C:\FLASHY\DATA\0019\0002\:	Rainfall at Dinajpur
C:\FLASHY\DATA\0019\0004\:	Dinajpur - Databox Raw WL
C:\FLASHY\DATA\0019\0003\:	Dinajpur -Processed WL
C:\FLASHY\DATA\0019\0005\:	Dinajpur - Databox Raw RF
C:\FLASHY\DATA\0019\0007\:	Dinajpur -Processed RF
C:\FLASHY\DATA\0019\0010\:	Rainfall at Dinajpur - 3hr Flashy
C:\FLASHY\DATA\0019\0011\:	Dinajpur - 6 h forecast
C:\FLASHY\DATA\0019\0012\:	Dinajpur - 12 h forecast
C:\FLASHY\DATA\0019\0013\:	Dinajpur - 24 h Forecast
C:\FLASHY\DATA\0019\0006\:	Dinajpur -M11update WL
C:\FLASHY\DATA\0078\0001\:	Q=0 Processed Q
C:\FLASHY\DATA\0078\0002\:	Q=10 Processed Q
C:\FLASHY\DATA\0078\0003\:	Q=2 Processed Q
C:\FLASHY\DATA\0078\0004\:	Dhepa-Art -Processed WL
C:\FLASHY\DATA\0078\0005\:	North Central EVP
C:\FLASHY\DATA\0078\0006\:	North East EVP
C:\FLASHY\DATA\0078\0007\:	North West EVP
C:\FLASHY\DATA\0016\0001\:	Teesta at Dalia -3 hourly WL
C:\FLASHY\DATA\0016\0002\:	Rainfall at Dalia
C:\FLASHY\DATA\0016\0004\:	Teesta at Dalia -Daily WL
C:\FLASHY\DATA\0016\0003\:	Dalia -Processed RF
C:\FLASHY\DATA\0016\0005\:	Rainfall at Dalia - 3hr Flashy
C:\FLASHY\DATA\0016\0006\:	Dalia - Databox Raw RF
C:\FLASHY\DATA\0048\0001\:	Karatoya at Panchagarh -3 hourly WL
C:\FLASHY\DATA\0048\0002\:	Rainfall at Panchagarh
C:\FLASHY\DATA\0048\0004\:	Karatoya at Panchagarh -Daily WL
C:\FLASHY\DATA\0048\0010\:	Panchagarh - Databox Raw WL
C:\FLASHY\DATA\0048\0003\:	Panchagarh -Processed Q
C:\FLASHY\DATA\0048\0005\:	Panchagarh -Processed WL
C:\FLASHY\DATA\0048\0006\:	Panchagarh - 6h estimate
C:\FLASHY\DATA\0048\0007\:	Panchagarh - 12h estimate
C:\FLASHY\DATA\0048\0008\:	Panchagarh - 24h estimate
C:\FLASHY\DATA\0048\0009\:	Panchagarh -Processed RF
C:\FLASHY\DATA\0048\0011\:	Panchagarh - Databox Raw RF
C:\FLASHY\DATA\0048\0013\:	Rainfall at Panchagarh - 3hr Flashy
C:\FLASHY\DATA\0075\0001\:	Mohanada at Rohanpur -Daily WL
C:\FLASHY\DATA\0075\0002\:	Rohanpur -Processed WL
C:\FLASHY\DATA\0075\0003\:	Rohanpur - 6h estimate
C:\FLASHY\DATA\0075\0004\:	Rohanpur - 12h estimate
C:\FLASHY\DATA\0075\0005\:	Rohanpur - 24h estimate
C:\FLASHY\DATA\0075\0006\:	Rohanpur - Databox Raw WL
C:\FLASHY\DATA\0075\0007\:	Rohanpur - Databox Raw RF
C:\FLASHY\DATA\0075\0009\:	Mohananda at Rohanpur - 3 hourly WL
C:\FLASHY\DATA\0073\0005\:	Mohadevpur - Databox Raw WL
C:\FLASHY\DATA\0073\0001\:	Atrai at Mohadevpur - 3 hourly WL
C:\FLASHY\DATA\0073\0002\:	Mohadevpur -Processed WL
C:\FLASHY\DATA\0073\0003\:	Rainfall at Mohadevpur
C:\FLASHY\DATA\0073\0004\:	Mohadevpur -Processed RF
C:\FLASHY\DATA\0073\0006\:	Rainfall at Mohadevpur - Databox Raw RF
C:\FLASHY\DATA\0073\0007\:	Mohadevpur - 6h estimate
C:\FLASHY\DATA\0073\0008\:	Mohadevpur - 12h estimate
C:\FLASHY\DATA\0073\0009\:	Mohadevpur - 24h estimate
C:\FLASHY\DATA\0081\0001\:	U.Atrai at Bhusirbandar - 3 hourly WL
C:\FLASHY\DATA\0081\0002\:	Bhusirbandar - 6 hr forecast
C:\FLASHY\DATA\0081\0003\:	Bhusirbandar - 12 hr forecast
C:\FLASHY\DATA\0081\0004\:	Bhusirbandar - 24 hr forecast
C:\FLASHY\DATA\0081\0005\:	Bhusirbandar - M11update WL
C:\FLASHY\DATA\0081\0007\:	Bhusirbandar - Databox Raw WL
C:\FLASHY\DATA\0087\0001\:	NW-SOUTH
C:\FLASHY\DATA\0087\0002\:	NW - NORTH
C:\FLASHY\DATA\0087\0003\:	NE-Flashy
C:\FLASHY\DATA\0039\0001\:	Manu at Moulvi Bazar -3 hourly WL
C:\FLASHY\DATA\0039\0002\:	Rainfall at Moulvi Bazar
C:\FLASHY\DATA\0039\0009\:	Moulvi Bazar -Hourly WL Flashy
C:\FLASHY\DATA\0039\0003\:	Moulvi Bazar - Databox Raw WL
C:\FLASHY\DATA\0039\0004\:	Moulvi Bazar -M11update WL
C:\FLASHY\DATA\0039\0005\:	Moulvi Bazar -6h forecast
C:\FLASHY\DATA\0039\0006\:	Moulvi Bazar -12h forecast
C:\FLASHY\DATA\0039\0007\:	Moulvi Bazar -24h forecast
C:\FLASHY\DATA\0039\0008\:	Moulvi Bazar -Processed RF
C:\FLASHY\DATA\0039\0011\:	Moulvi Bazar - Databox Raw RF
C:\FLASHY\DATA\0037\0001\:	Manu at Manu Rly Br -3 hourly WL
C:\FLASHY\DATA\0037\0002\:	Rainfall at Manu Rly Br.
C:\FLASHY\DATA\0037\3015\:	Manu RB -Hourly WL Flashy

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C:\FLASHY\DATA\0037\0003\:      Manu Rly Br -Processed Q
C:\FLASHY\DATA\0037\0004\:      Manu RB - Scaled for Dhalai - Processed Q
C:\FLASHY\DATA\0037\0005\:      Manu Rly Br -Processed WL
C:\FLASHY\DATA\0037\0006\:      Manu -Telemetry Hourly WL
C:\FLASHY\DATA\0037\0007\:      Manu -Telemetry Rainfall
C:\FLASHY\DATA\0037\0008\:      Manu RB - 6h estimate
C:\FLASHY\DATA\0037\0009\:      Manu RB - 12h estimate
C:\FLASHY\DATA\0037\0010\:      Manu RB - 24h estimate
C:\FLASHY\DATA\0037\0011\:      Manu RB - Scaled for Dhalai - 6h estimate
C:\FLASHY\DATA\0037\0012\:      Manu RB - Scaled for Dhalai -  12h estimate
C:\FLASHY\DATA\0037\0013\:      Manu RB - Scaled for Dhalai -  24h estimate
C:\FLASHY\DATA\0037\0014\:      Manu Rly Br -Processed RF
C:\FLASHY\DATA\0037\0017\:      Manu RB - Databox Raw WL
C:\FLASHY\DATA\0037\0018\:      Manu RB - Databox Raw RF
C:\FLASHY\DATA\0037\0019\:      Manu RB - Processed Q Telemetry
C:\FLASHY\DATA\0037\0020\:      Manu RB - Processed Q - Hourly Flashy
C:\FLASHY\DATA\0037\0021\:      Manu RB - Scaled for Dhalai - Processed Q - Telemetry
C:\FLASHY\DATA\0037\0022\:      Manu RB - Scaled for Dhalai - Processed Q - Hourly
Flashy
C:\FLASHY\DATA\0037\0023\:      Manu RB - Processed RF - Telemetry
C:\FLASHY\DATA\0077\0001\:      Sherpur -Telemetry Hourly WL
C:\FLASHY\DATA\0077\0002\:      Sherpur -Processed WL
```

Appendix B

The Super Model Flood Watch Database Sensor Setup

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C:\FAP10\DATA\0001\0001\:       Kushiyara at Amalshid -3 hourly WL
□
C:\FAP10\DATA\0001\0002\:       Amalshid -Processed  WL
C:\FAP10\DATA\0001\0003\:       Amalshid -Scaled for Sonaibardal  -Processed Q
C:\FAP10\DATA\0001\0004\:       Amalshid Barak -Processed Q
C:\FAP10\DATA\0001\0005\:       Amalshid -Scaled for Sonaibardal - 24h estimate
C:\FAP10\DATA\0001\0006\:       Amalshid - Scaled for Sonaibardal - 48h estimate
C:\FAP10\DATA\0001\0007\:       Amalshid - Scaled for Sonaibardal- 72h estimate
C:\FAP10\DATA\0001\0008\:       Amalshid Barak - 24h estimate
C:\FAP10\DATA\0001\0009\:       Amalshid Barak - 48 h estimate
C:\FAP10\DATA\0001\0010\:       Amalshid Barak - 72h estimate
C:\FAP10\DATA\0002\0001\:       Brahmaputra at Aricha -3 hourly WL
C:\FAP10\DATA\0002\0003\:       Aricha - 24 h forecast
C:\FAP10\DATA\0002\0004\:       Aricha - 48 h forecast
C:\FAP10\DATA\0002\0005\:       Aricha - 72 h forecast
C:\FAP10\DATA\0002\0002\:       Aricha - Databaox Raw WL
C:\FAP10\DATA\0003\0002\:       B'putra at Bahadurabad -Daily WL
C:\FAP10\DATA\0003\0001\:       B'putra at Bahadurabad -3 hourly WL
C:\FAP10\DATA\0003\0003\:       Bahadurabad - 24 h forecast
C:\FAP10\DATA\0003\0004\:       Bahadurabad - 48 h forecast
C:\FAP10\DATA\0003\0005\:       Bahadurabad - 72 h forecast
C:\FAP10\DATA\0003\0007\:       Discharge at Bahadurabad
C:\FAP10\DATA\0003\0006\:       Bahadurabad -M1lupdate WL
C:\FAP10\DATA\0003\0008\:       Bahadurabad - Databox Raw WL
C:\FAP10\DATA\0003\0009\:       Bahadurabad - Databox Raw RF
C:\FAP10\DATA\0066\0001\:       Rainfall at Bheramara
C:\FAP10\DATA\0066\0002\:       Bheramara -Processed RF
C:\FAP10\DATA\0081\0001\:       U.Atrai at Bhusirbandar - 3 hourly WL
C:\FAP10\DATA\0081\0005\:       Bhusirbandar - M1lupdate WL
C:\FAP10\DATA\0081\0006\:       Bhusirbandar - Mean daily Q
C:\FAP10\DATA\0081\0007\:       Bhusirbandar - Databox Raw WL
C:\FAP10\DATA\0081\0008\:       Bhusirbandar - 24 hr forecast
C:\FAP10\DATA\0081\0009\:       Bhusirbandar - 48 hr forecast
C:\FAP10\DATA\0081\0010\:       Bhusirbandar - 72 hr forecast
C:\FAP10\DATA\0004\0001\:       Sangu at Bandarban -3 houly WL
C:\FAP10\DATA\0004\0002\:       Rainfall at Bandarban
C:\FAP10\DATA\0004\0003\:       Sangu at Bandarban -Daily WL
C:\FAP10\DATA\0004\0004\:       Bandarban -Processed RF
C:\FAP10\DATA\0005\0002\:       Rainfall at Barisal
C:\FAP10\DATA\0005\0001\:       Barisal -Processed RF
C:\FAP10\DATA\0006\0001\:       Ganges at Bhagyakul -3 hourly WL
C:\FAP10\DATA\0006\0003\:       Bhagyakul - 24 h forecast
C:\FAP10\DATA\0006\0004\:       Bhagyakul - 48 h forecast
C:\FAP10\DATA\0006\0005\:       Bhagyakul - 72 h forecast
C:\FAP10\DATA\0006\0002\:       Ganges at Bhagyakul -Daily WL
C:\FAP10\DATA\0006\0006\:       Bhagyakul -M1lupdate WL
C:\FAP10\DATA\0006\0007\:       Bhagyakul - Databox Raw WL
C:\FAP10\DATA\0007\0001\:       U'Meghna at Bhairab Bz -Daily WL
C:\FAP10\DATA\0007\0002\:       Rainfall at Bhairab Bazar
C:\FAP10\DATA\0007\0003\:       Bhairab Bazar - 24 h forecast
C:\FAP10\DATA\0007\0004\:       Bhairab Bazar - 48 h forecast
C:\FAP10\DATA\0007\0005\:       Bhairab Bazar - 72 h forecast
C:\FAP10\DATA\0007\0007\:       U'Meghna at Bhairab Bz -3 hourly WL
C:\FAP10\DATA\0007\0006\:       Bhairab Bazar -M1lupdate WL
C:\FAP10\DATA\0007\0008\:       Bhairab Bazar -Processed RF
C:\FAP10\DATA\0007\0009\:       Bhairab Bazar - Databox Raw WL
C:\FAP10\DATA\0007\0010\:       Bhairab bazar - Databox Raw RF
C:\FAP10\DATA\0008\0002\:       Rainfall at Bogra
C:\FAP10\DATA\0008\0001\:       Karatoya at Bogra - 3 hourly WL
C:\FAP10\DATA\0008\0003\:       Bogra -M1lupdate WL
C:\FAP10\DATA\0008\0004\:       Bogra -Processed RF
C:\FAP10\DATA\0008\0005\:       Bogra - 24 h forecast
C:\FAP10\DATA\0008\0006\:       Bogra - 48 h forecast
C:\FAP10\DATA\0008\0007\:       Bogra - 72 h forecast
C:\FAP10\DATA\0008\0008\:       Bogra - Databox Raw WL
C:\FAP10\DATA\0008\0009\:       Bogra - Databox Raw RF
C:\FAP10\DATA\0009\0003\:       L'Meghna at Chandpur _L.W.L
C:\FAP10\DATA\0009\0001\:       L'Meghna at Chandpur_H.W.L.
C:\FAP10\DATA\0009\0002\:       Rainfall at Chandpur
C:\FAP10\DATA\0009\0004\:       L'Meghna at Chandpur_M.W.L
C:\FAP10\DATA\0009\0005\:       Chandpur -Processed WL
C:\FAP10\DATA\0009\0006\:       Chandpur - 24h estimate
C:\FAP10\DATA\0009\0007\:       Chandpur - 48h estimate
C:\FAP10\DATA\0009\0008\:       Chandpur - 72h estimate
C:\FAP10\DATA\0009\0009\:       Chandpur.-Processed RF
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C:\FAP10\DATA\0009\0010\:	Chandpur - Databox Raw WL
C:\FAP10\DATA\0009\0011\:	Chandpur - Databox Raw RF
C:\FAP10\DATA\0009\0012\:	Chandpur - Hourly WL
C:\FAP10\DATA\0010\0001\:	Mohananda at C'Nawabganj -Daily WL
C:\FAP10\DATA\0010\0003\:	Mohananda at C'Nawabganj -3 hourly WL
C:\FAP10\DATA\0010\0002\:	Rainfall at Chapai-Nawabganj
C:\FAP10\DATA\0010\0004\:	C.Nawabganj -Mllupdate WL
C:\FAP10\DATA\0010\0005\:	Chapai-Nawabganj - 24 h forecast
C:\FAP10\DATA\0010\0006\:	Chapai-Nawabganj - 48 h forecast
C:\FAP10\DATA\0010\0007\:	Chapai-Nawabganj - 72 h forecast
C:\FAP10\DATA\0010\0008\:	Chapai Nawabganj -Processed RF
C:\FAP10\DATA\0010\0009\:	Chapai Nawabganj - Databox Raw WL
C:\FAP10\DATA\0010\0010\:	Chapai Nawabganj - Databox Raw RF
C:\FAP10\DATA\0011\0001\:	Brahmaputra at Chilmari -3 hourly WL
C:\FAP10\DATA\0011\0002\:	Rainfall at Chilmari
C:\FAP10\DATA\0011\0003\:	Chilmari - 24h forecast
C:\FAP10\DATA\0011\0004\:	Chilmari - 48 h forecast
C:\FAP10\DATA\0011\0005\:	Chilmari - 72 h forecast
C:\FAP10\DATA\0011\0007\:	Chilmari - Databox Raw WL
C:\FAP10\DATA\0011\0006\:	Chilmari -Mllupdate WL
C:\FAP10\DATA\0011\0008\:	Chilmari -Processed RF
C:\FAP10\DATA\0011\0009\:	Chilmari - Databox Raw RF
C:\FAP10\DATA\0012\0001\:	Matamuhuri at Chiringa -3 hourly WL
C:\FAP10\DATA\0013\0002\:	Rainfall at Chittagong
C:\FAP10\DATA\0013\0001\:	Chittagong -Processed RF
C:\FAP10\DATA\0014\0001\:	Gumti at Comilla -3 hourly WL
C:\FAP10\DATA\0014\0002\:	Rainfall at Comilla
C:\FAP10\DATA\0014\0003\:	Gumti at Comilla -Daily WL
C:\FAP10\DATA\0014\0004\:	Comilla -Processed RF
C:\FAP10\DATA\0015\0003\:	Bogkhali at Cox's Bazar_L.W.L
C:\FAP10\DATA\0015\0002\:	Rainfall at Coxs Bazar
C:\FAP10\DATA\0015\0001\:	Bogkhali at Cox's Bazar -3 hourly WL
C:\FAP10\DATA\0015\0004\:	Cox's Bazar -Processed RF
C:\FAP10\DATA\0016\0001\:	Teesta at Dalia -3 hourly WL
C:\FAP10\DATA\0016\0002\:	Rainfall at Dalia
C:\FAP10\DATA\0016\0004\:	Teesta at Dalia -Daily WL
C:\FAP10\DATA\0016\0003\:	Dalia -Processed RF
C:\FAP10\DATA\0016\0005\:	Rainfall Dalia - 3hr Flashy
C:\FAP10\DATA\0016\0006\:	Dalia - Databox Raw WL
C:\FAP10\DATA\0016\0007\:	Dalia - Databox Raw RF
C:\FAP10\DATA\0017\0002\:	Rainfall at Dewanganj
C:\FAP10\DATA\0017\0001\:	Dewangang -Processed RF
C:\FAP10\DATA\0018\0001\:	Buriganga at Dhaka -3 hourly WL
C:\FAP10\DATA\0018\0002\:	Rainfall at Dhaka
C:\FAP10\DATA\0018\0003\:	Dhaka - 24 h forecast
C:\FAP10\DATA\0018\0004\:	Dhaka - 48 h forecast
C:\FAP10\DATA\0018\0005\:	Dhaka - 72 h forecast
C:\FAP10\DATA\0018\0007\:	Buriganga at Dhaka -Daily WL
C:\FAP10\DATA\0018\0006\:	Dhaka -Mllupdate WL
C:\FAP10\DATA\0018\0008\:	Millbarak -Telemetry Hourly WL
C:\FAP10\DATA\0018\0009\:	Dhaka -Processed RF
C:\FAP10\DATA\0019\0001\:	Punarhaba at Dinajpur -3 hourly WL
C:\FAP10\DATA\0019\0002\:	Rainfall at Dinajpur
C:\FAP10\DATA\0019\0003\:	Dinajpur -Processed WL
C:\FAP10\DATA\0019\0004\:	Dinajpur - Databox Raw WL
C:\FAP10\DATA\0019\0005\:	Dinajpur - Databox Raw RF
C:\FAP10\DATA\0019\0007\:	Dinajpur -Processed RF
C:\FAP10\DATA\0019\0010\:	Rainfall at Dinajpur - 3hr Flashy
C:\FAP10\DATA\0019\0014\:	Dinajpur - 24h estimate
C:\FAP10\DATA\0019\0015\:	Dinajpur - 48h estimate
C:\FAP10\DATA\0019\0016\:	Dinajpur - 72h estimate
C:\FAP10\DATA\0020\0001\:	Sangu at Dohazari -3 hourly WL
C:\FAP10\DATA\0021\0001\:	Shibganjdhala at Durgapur -3 hourly WL
C:\FAP10\DATA\0021\0002\:	Rainfall at Durgapur
C:\FAP10\DATA\0021\0003\:	Durgapur -Processed WL
C:\FAP10\DATA\0021\0004\:	Durgapur Processed Q
C:\FAP10\DATA\0021\0005\:	Durgapur - 24h Q estimate
C:\FAP10\DATA\0021\0006\:	Durgapur - 48h Q estimate
C:\FAP10\DATA\0021\0007\:	Durgapur - 72h Q estimate
C:\FAP10\DATA\0021\0008\:	Durgapur -Processed RF
C:\FAP10\DATA\0021\0009\:	Durgapur - 24 h WL estimate
C:\FAP10\DATA\0021\0010\:	Durgapur - 48 h WL estimate
C:\FAP10\DATA\0021\0011\:	Durgapur - 72 hr WL estimate
C:\FAP10\DATA\0021\0012\:	Durgapur - Databox Raw WL
C:\FAP10\DATA\0021\0013\:	Durgapur - Dtabox Raw RF

C:\FAP10\DATA\0022\0001\:	Kumar at Faridpur -3 hourly WL
C:\FAP10\DATA\0022\0002\:	Rainfall at Faridpur
C:\FAP10\DATA\0022\0003\:	Faridpur -Processed RF
C:\FAP10\DATA\0023\0002\:	Rainfall at Gaibandha
C:\FAP10\DATA\0023\0001\:	Ghagot at Gaibandha -3 hourly WL
C:\FAP10\DATA\0023\0003\:	Gaibandha -Processed WL
C:\FAP10\DATA\0023\0004\:	Gaibhanda - 24h estimate
C:\FAP10\DATA\0023\0005\:	Gaibhanda - 48h estimate
C:\FAP10\DATA\0023\0006\:	Gaibhanda - 72h estimate
C:\FAP10\DATA\0023\0007\:	Gaibandha -Processed RF
C:\FAP10\DATA\0023\0008\:	Gaibanda - Databox Raw WL
C:\FAP10\DATA\0023\0009\:	Gaibanda - Databox Raw RF
C:\FAP10\DATA\0024\0006\:	Discharge at Goalondo
C:\FAP10\DATA\0024\0001\:	Ganges at Goalundo -3 hourly WL
C:\FAP10\DATA\0024\0003\:	Goalundo - 24 h forecast
C:\FAP10\DATA\0024\0004\:	Goalundo - 48 h forecast
C:\FAP10\DATA\0024\0005\:	Goalundo - 72 h forecast
C:\FAP10\DATA\0024\0002\:	Ganges at Goalundo -Daily WL
C:\FAP10\DATA\0024\0007\:	Goalondo -M11update WL
C:\FAP10\DATA\0024\0008\:	Goalundo - Databox Raw WL
C:\FAP10\DATA\0025\0003\:	Discharge at Gorai Rly Br
C:\FAP10\DATA\0025\0001\:	Gorai at Gorai Rly Br -3 hourly WL
C:\FAP10\DATA\0025\0002\:	Gorai at Gorai Rly Br -Daily WL
C:\FAP10\DATA\0025\0004\:	Gorai Rly Br -Processed WL
C:\FAP10\DATA\0025\0005\:	Gorai RB - 24h estimate
C:\FAP10\DATA\0025\0006\:	Gorai RB - 48h estimate
C:\FAP10\DATA\0025\0007\:	Gorai RB - 72h estimate
C:\FAP10\DATA\0025\0008\:	Gorai Rly Brg - Databox Raw WL
C:\FAP10\DATA\0026\0001\:	Khowai at Habiganj -3 hourly WL
C:\FAP10\DATA\0026\0002\:	Rainfall at Habiganj
C:\FAP10\DATA\0026\0003\:	Habiganj -Processed WL
C:\FAP10\DATA\0026\0004\:	Habiganj -Processed RF
C:\FAP10\DATA\0026\0005\:	Habiganj - Databox Raw WL
C:\FAP10\DATA\0026\0006\:	Habiganj - Databox Raw RF
C:\FAP10\DATA\0027\0001\:	Ganges at Hardinge Br -3 houly WL
C:\FAP10\DATA\0027\0003\:	Hardinge Bridge - 24 h forecast
C:\FAP10\DATA\0027\0004\:	Hardinge Bridge - 48 h forecast
C:\FAP10\DATA\0027\0005\:	Hardinge Bridge - 72 h forecast
C:\FAP10\DATA\0027\0006\:	Discharge at Hardinge Br
C:\FAP10\DATA\0027\0002\:	Ganges at Hardinge Br -Daily WL
C:\FAP10\DATA\0027\0007\:	Hardinge Br -M11update WL
C:\FAP10\DATA\0027\0008\:	Hardinge Brg - Databox Raw WL
C:\FAP10\DATA\0028\0001\:	Old Dhaleswari at Jagir -3 hourly WL
C:\FAP10\DATA\0028\0002\:	Jagir - M11update WL
C:\FAP10\DATA\0028\0003\:	Jagir - 24 h forecast
C:\FAP10\DATA\0028\0004\:	Jagir - 48 h forecast
C:\FAP10\DATA\0028\0005\:	Jagir - 72 h forecast
C:\FAP10\DATA\0028\0006\:	Jagir - Databox Raw WL
C:\FAP10\DATA\0029\0001\:	O'Brahmaputra at Jamalpur -3 hourly WL
C:\FAP10\DATA\0029\0002\:	Rainfall at Jamalpur
C:\FAP10\DATA\0029\0003\:	Jamalpur - 24 h forecast
C:\FAP10\DATA\0029\0004\:	Jamalpur - 48 h forecast
C:\FAP10\DATA\0029\0005\:	Jamalpur - 72 h forecast
C:\FAP10\DATA\0029\0007\:	O'Brahmaputra at Jamalpur -Daily WL
C:\FAP10\DATA\0029\0006\:	Jamalpur -M11update WL
C:\FAP10\DATA\0029\0008\:	Jamalpur -Processed RF
C:\FAP10\DATA\0029\0009\:	Jamalpur - Databox Raw WL
C:\FAP10\DATA\0029\0010\:	Jamalpur - Databox Raw RF
C:\FAP10\DATA\0030\0002\:	Rainfall at Jessore
C:\FAP10\DATA\0030\0001\:	Jessore -Processed RF
C:\FAP10\DATA\0031\0001\:	Surma at Kanaighat -3 hourly WL
C:\FAP10\DATA\0031\0002\:	Rainfall at Kanaighat
C:\FAP10\DATA\0031\0003\:	Kanaighat - Databox Raw WL
C:\FAP10\DATA\0031\0004\:	Kanaighat -M11update WL
C:\FAP10\DATA\0031\0005\:	Kanaighat -24 h forecast
C:\FAP10\DATA\0031\0006\:	Kanaighat -48h forecast
C:\FAP10\DATA\0031\0007\:	Kanaighat -72h forecast
C:\FAP10\DATA\0031\0008\:	Kanaighat -Processed RF
C:\FAP10\DATA\0031\0009\:	Kanaighat - Databox Raw RF
C:\FAP10\DATA\0032\0001\:	Teesta at Kaunia -3 hourly WL
C:\FAP10\DATA\0032\0002\:	Rainfall at Kaunia
C:\FAP10\DATA\0032\0004\:	Teesta at Kaunia -Daily WL
C:\FAP10\DATA\0032\0003\:	Kaunia -Processed WL
C:\FAP10\DATA\0032\0005\:	Kaunia RB - 24h estimate
C:\FAP10\DATA\0032\0006\:	Kaunia RB - 48h estimate

C:\FAP10\DATA\0032\0007\:	Kaunia RB - 72h estimate
C:\FAP10\DATA\0032\0008\:	Kaunia -Processed RF
C:\FAP10\DATA\0032\0009\:	Kaunia -Processed Q
C:\FAP10\DATA\0032\0010\:	Kaunia - databox Raw WL
C:\FAP10\DATA\0032\0011\:	Kaunia - Databox Raw RF
C:\FAP10\DATA\0033\0002\:	Rainfall at Khulna
C:\FAP10\DATA\0033\0001\:	Khulna -Processed RF
C:\FAP10\DATA\0034\0001\:	Darla at Kurigram -3 hourly WL
C:\FAP10\DATA\0034\0002\:	Rainfall at Kurigram
C:\FAP10\DATA\0034\0004\:	Darla at Kurigram -Daily WL
C:\FAP10\DATA\0034\0003\:	Kurigram -Processed WL
C:\FAP10\DATA\0034\0005\:	Kurigram - 24h estimate
C:\FAP10\DATA\0034\0006\:	Kurigram - 48h estimate
C:\FAP10\DATA\0034\0007\:	Kurigram - 72h estimate
C:\FAP10\DATA\0034\0008\:	Kurigram -Processed RF
C:\FAP10\DATA\0034\0009\:	Kurigram - Databox Raw WL
C:\FAP10\DATA\0034\0010\:	Kurigram - Dtabox Raw RF
C:\FAP10\DATA\0035\0002\:	Rainfall at Kushtia
C:\FAP10\DATA\0035\0001\:	Kushtia -Processed RF
C:\FAP10\DATA\0036\0001\:	Matamuhuri at Lama -3 hourly WL
C:\FAP10\DATA\0036\0002\:	Rainfall at Lama
C:\FAP10\DATA\0036\0003\:	Lama -Processed RF
C:\FAP10\DATA\0037\0001\:	Manu at Manu Rly Br -3 hourly WL
C:\FAP10\DATA\0037\0002\:	Rainfall at Manu Rly Br.
C:\FAP10\DATA\0037\0003\:	Manu Rly Br -Processed Q
C:\FAP10\DATA\0037\0004\:	Manu RB - Scaled for Dhalai - Processed Q
C:\FAP10\DATA\0037\0005\:	Manu Rly Br -Processed WL
C:\FAP10\DATA\0037\0006\:	Manu -Telemetry Hourly WL
C:\FAP10\DATA\0037\0007\:	Manu -Telemetry Rainfall
C:\FAP10\DATA\0037\0011\:	Manu RB - Scaled for Dhalai - 24h estimate
C:\FAP10\DATA\0037\0012\:	Manu RB - Scaled for Dhalai - 48h estimate
C:\FAP10\DATA\0037\0013\:	Manu RB - Scaled for Dhalai - 72h estimate
C:\FAP10\DATA\0037\0014\:	Manu Rly Br -Processed RF
C:\FAP10\DATA\0037\0015\:	Manu RB -Hourly WL Flashy
C:\FAP10\DATA\0037\0016\:	Rainfall at Manu Rly. Br. - Hourly Flashy
C:\FAP10\DATA\0037\0017\:	Manu RB - Databox Raw WL
C:\FAP10\DATA\0037\0018\:	Manu RB - Databox Raw RF
C:\FAP10\DATA\0037\0024\:	Manu RB - 24h estimate
C:\FAP10\DATA\0037\0025\:	Manu RB - 48h estimate
C:\FAP10\DATA\0037\0026\:	Manu RB - 72h estimate
C:\FAP10\DATA\0038\0001\:	Turag at Mirpur -3 hourly WL
C:\FAP10\DATA\0038\0002\:	Turag at Mirpur -Daily WL
C:\FAP10\DATA\0038\0003\:	Mirpur -M11update WL
C:\FAP10\DATA\0038\0004\:	Mirpur -Telemetry Hourly WL
C:\FAP10\DATA\0038\0005\:	Mirpur -24h forecast
C:\FAP10\DATA\0038\0006\:	Mirpur -48h forecast
C:\FAP10\DATA\0038\0007\:	Mirpur -72h forecast
C:\FAP10\DATA\0039\0001\:	Manu at Moulvi Bazar -3 hourly WL
C:\FAP10\DATA\0039\0002\:	Rainfall at Moulvi Bazar
C:\FAP10\DATA\0039\0003\:	Moulvi Bazar - Databox Raw WL
C:\FAP10\DATA\0039\0004\:	Moulvi Bazar -M11update WL
C:\FAP10\DATA\0039\0008\:	Moulvi Bazar -Processed RF
C:\FAP10\DATA\0039\0009\:	Moulvi Bazar - Hourly WL Flashy
C:\FAP10\DATA\0039\0010\:	Rainfall at Moulvi Bazar - Hourly Flashy
C:\FAP10\DATA\0039\0011\:	Moulvi Bazar - Databox Raw RF
C:\FAP10\DATA\0039\0012\:	Moulvi Bazar -24h forecast
C:\FAP10\DATA\0039\0013\:	Moulvi Bazar -48h forecast
C:\FAP10\DATA\0039\0014\:	Moulvi Bazar -72h forecast
C:\FAP10\DATA\0040\0001\:	O'Brahmaputra at Mymensingh -3 hourly WL
C:\FAP10\DATA\0040\0002\:	Rainfall at Mymensingh
C:\FAP10\DATA\0040\0003\:	Mymensingh - 24 h forecast
C:\FAP10\DATA\0040\0004\:	Mymensingh - 48 h forecast
C:\FAP10\DATA\0040\0005\:	Mymensingh - 72 h forecast
C:\FAP10\DATA\0040\0008\:	O'Brahmaputra at Mymensingh -Daily WL
C:\FAP10\DATA\0040\0006\:	Mymensingh -M11update WL
C:\FAP10\DATA\0040\0007\:	Mymensingh -Processed RF
C:\FAP10\DATA\0040\0009\:	Mymensingh - Databox Raw WL
C:\FAP10\DATA\0040\0010\:	Mymensingh - Databox Raw RF
C:\FAP10\DATA\0041\0001\:	Jamuna at Naogaon -3 hourly WL
C:\FAP10\DATA\0041\0002\:	Rainfall at Naogaon
C:\FAP10\DATA\0041\0003\:	Naogaon -M11update WL
C:\FAP10\DATA\0041\0004\:	Naogaon -24h forecast
C:\FAP10\DATA\0041\0005\:	Naogaon -48h forecast
C:\FAP10\DATA\0041\0006\:	Naogaon -72h forecast
C:\FAP10\DATA\0041\0007\:	Naogaon -Processed RF

C:\FAP10\DATA\0041\0008\:	Naogaon - Databox Raw WL
C:\FAP10\DATA\0041\0009\:	Naogaon - Databox Raw RF
C:\FAP10\DATA\0042\0001\:	Halda at Narayan Hat -3 hourly WL
C:\FAP10\DATA\0042\0002\:	Rainfall at Narayan Hat
C:\FAP10\DATA\0043\0001\:	Lakhya at Narayanganj -3 hourly WL
C:\FAP10\DATA\0043\0002\:	Lakhya at Narayanganj -Daily WL
C:\FAP10\DATA\0043\0003\:	Narayanganj -Telemetry Hourly WL
C:\FAP10\DATA\0043\0004\:	Narayanganj -Telemetry Rainfall
C:\FAP10\DATA\0044\0001\:	Bangshi at Nayarhat -3 hourly WL
C:\FAP10\DATA\0044\0002\:	Nayarhat -Telemetry Hourly WL
C:\FAP10\DATA\0044\0003\:	Nayarhat - 24 h forecast
C:\FAP10\DATA\0044\0004\:	Nayarhat - 48 h forecast
C:\FAP10\DATA\0044\0005\:	Nayarhat - 72 h forecast
C:\FAP10\DATA\0044\0006\:	Nayarhat - M11update WL
C:\FAP10\DATA\0045\0002\:	Rainfall at Noakhali
C:\FAP10\DATA\0045\0001\:	Noakhali -Processed RF
C:\FAP10\DATA\0046\0001\:	B'putra at Noonkhawa -3 hourly WL
C:\FAP10\DATA\0046\0002\:	Noonkhawa -Processed WL
C:\FAP10\DATA\0046\0003\:	Jatrapur 1 -Telemetry Hourly WL
C:\FAP10\DATA\0046\0004\:	Jatrapur 2 -Telemetry Hourly WL
C:\FAP10\DATA\0046\0005\:	Jatrapur -Telemetry Rainfall
C:\FAP10\DATA\0046\0006\:	Noonkhawa - 24h estimate
C:\FAP10\DATA\0046\0007\:	Noonkhawa - 48h estimate
C:\FAP10\DATA\0046\0008\:	Noonkhawa - 72h estimate
C:\FAP10\DATA\0047\0002\:	Rainfall at Pabna
C:\FAP10\DATA\0047\0001\:	Pabna -Processed RF
C:\FAP10\DATA\0048\0001\:	Karatoya at Panchagarh -3 hourly WL
C:\FAP10\DATA\0048\0002\:	Rainfall at Panchagarh
C:\FAP10\DATA\0048\0004\:	Karatoya at Panchagarh -Daily WL
C:\FAP10\DATA\0048\0003\:	Panchagarh -Processed Q
C:\FAP10\DATA\0048\0005\:	Panchagarh -Processed WL
C:\FAP10\DATA\0048\0009\:	Panchagarh -Processed RF
C:\FAP10\DATA\0048\0011\:	Panchagarh - Databox Raw RF
C:\FAP10\DATA\0048\0010\:	Panchagarh - Databox Raw WL
C:\FAP10\DATA\0048\0012\:	Mean daily Q
C:\FAP10\DATA\0048\0013\:	Rainfall at Panchgarh - 3hr flashy
C:\FAP10\DATA\0048\0014\:	Panchagarh - 24h estimate
C:\FAP10\DATA\0048\0015\:	Panchagarh - 48h estimate
C:\FAP10\DATA\0048\0016\:	Panchagarh - 72h estimate
C:\FAP10\DATA\0049\0001\:	Halda at Panchpukuria -3 hourly WL
C:\FAP10\DATA\0049\0002\:	Rainfall at Panchpukuria
C:\FAP10\DATA\0049\0003\:	Halda at Panchpukuria -Daily WL
C:\FAP10\DATA\0050\0001\:	Ganges at Pankha -3 hourly WL
C:\FAP10\DATA\0050\0002\:	Pankha -Processed WL
C:\FAP10\DATA\0050\0003\:	Pankha -Telemetry Hourly WL
C:\FAP10\DATA\0050\0004\:	Pankha -Telemetry Rainfall
C:\FAP10\DATA\0050\0005\:	Pankha - 24h estimate
C:\FAP10\DATA\0050\0006\:	Pankha - 48h estimate
C:\FAP10\DATA\0050\0007\:	Pankha - 72h estimate
C:\FAP10\DATA\0050\0008\:	Pankha - Databox Raw WL
C:\FAP10\DATA\0051\0001\:	Muhuri at Parshuram -3 hourly WL
C:\FAP10\DATA\0051\0002\:	Rainfall at Parshuram
C:\FAP10\DATA\0051\0004\:	Muhuri at Parshuram -Daily WL
C:\FAP10\DATA\0051\0005\:	Parshuram -Processed RF
C:\FAP10\DATA\0052\0002\:	Rainfall at Patuakhali
C:\FAP10\DATA\0052\0001\:	Patuakhali -Processed RF
C:\FAP10\DATA\0053\0001\:	Ganges at Rajshahi -3 hourly WL
C:\FAP10\DATA\0053\0002\:	Rainfall at Rajshahi
C:\FAP10\DATA\0053\0003\:	Rajshahi - 24 h forecast
C:\FAP10\DATA\0053\0004\:	Rajshahi - 48 h forecast
C:\FAP10\DATA\0053\0005\:	Rajshahi - 72 h forecast
C:\FAP10\DATA\0053\0006\:	Rajshahi -M11update WL
C:\FAP10\DATA\0053\0007\:	Rajshahi -Processed RF
C:\FAP10\DATA\0053\0008\:	Rajshahi - Databox Raw WL
C:\FAP10\DATA\0053\0009\:	Rajshahi - Databox Raw RF
C:\FAP10\DATA\0054\0001\:	Padma at Ramgarh -3 hourly WL
C:\FAP10\DATA\0054\0002\:	Rainfall at Ramgarh
C:\FAP10\DATA\0054\0003\:	Ramgarh -Processed RF
C:\FAP10\DATA\0055\0002\:	Rainfall at Ranganmati
C:\FAP10\DATA\0056\0002\:	Rainfall at Rangpur
C:\FAP10\DATA\0056\0001\:	Rangpur -Processed RF
C:\FAP10\DATA\0057\0002\:	Rainfall at Sandwip
C:\FAP10\DATA\0058\0002\:	Rainfall at Satkhira
C:\FAP10\DATA\0058\0001\:	Satkhira -Processed RF
C:\FAP10\DATA\0059\0001\:	Brahmaputra at Serajganj -3 hourly WL

C:\FAP10\DATA\0059\0003\:	Serajganj - 24 h forecast
C:\FAP10\DATA\0059\0004\:	Serajganj - 48 h forecast
C:\FAP10\DATA\0059\0005\:	Serajganj - 72 h forecast
C:\FAP10\DATA\0059\0006\:	Brahmaputra at Serajganj -Daily WL
C:\FAP10\DATA\0059\0002\:	Rainfall at Serajganj
C:\FAP10\DATA\0059\0007\:	Serajganj -Mllupdate WL
C:\FAP10\DATA\0059\0008\:	Serajganj -Processed RF
C:\FAP10\DATA\0059\0009\:	Serajganj - Databox Raw WL
C:\FAP10\DATA\0059\0010\:	Serajganj - Databox Raw RF
C:\FAP10\DATA\0060\0001\:	Kushiyara at Sheola -3 hourly WL
C:\FAP10\DATA\0060\0002\:	Rainfall at Sheola
C:\FAP10\DATA\0060\0003\:	Sheola - 24 h forecast
C:\FAP10\DATA\0060\0004\:	Sheola - 48 h forecast
C:\FAP10\DATA\0060\0005\:	Sheola - 72 h forecast
C:\FAP10\DATA\0060\0007\:	Kushiyara at Sheola -Daily WL
C:\FAP10\DATA\0060\0006\:	Sheola -Mllupdate WL
C:\FAP10\DATA\0060\0008\:	Sheola -Processed RF
C:\FAP10\DATA\0060\0009\:	Sheola - Databox Raw WL
C:\FAP10\DATA\0060\0010\:	Sheola - Databox Raw RF
C:\FAP10\DATA\0061\0001\:	Surma at Sunamaganj -3 hourly Wl
C:\FAP10\DATA\0061\0002\:	Rainfall at Sunamganj
C:\FAP10\DATA\0061\0003\:	Sunamaganj - 24 h forecast
C:\FAP10\DATA\0061\0004\:	Sunamaganj - 48 h forecast
C:\FAP10\DATA\0061\0005\:	Sunamaganj - 72 h forecast
C:\FAP10\DATA\0061\0006\:	Sunamganj -Mllupdate WL
C:\FAP10\DATA\0061\0007\:	Sunamganj -Processed RF
C:\FAP10\DATA\0061\0008\:	Sunamganj - Databox Raw WL
C:\FAP10\DATA\0061\0009\:	Sunamganj - Databox Raw RF
C:\FAP10\DATA\0062\0001\:	Surma at Sylhet -3 hourly WL
C:\FAP10\DATA\0062\0002\:	Rainfall at Sylhet
C:\FAP10\DATA\0062\0003\:	Sylhet - 24 h forecast
C:\FAP10\DATA\0062\0004\:	Sylhet - 48 h forecast
C:\FAP10\DATA\0062\0005\:	Sylhet - 72 h forecast
C:\FAP10\DATA\0062\0007\:	Surma at Sylhet -daily Wl
C:\FAP10\DATA\0062\0006\:	Sylhet -Mllupdate WL
C:\FAP10\DATA\0062\0008\:	Sylhet -Processed RF
C:\FAP10\DATA\0062\0009\:	Sylhat - Databox Raw WL
C:\FAP10\DATA\0062\0010\:	Sylhat - Databox Raw RF
C:\FAP10\DATA\0063\0002\:	Rainfall at Tangail
C:\FAP10\DATA\0063\0001\:	Tangail -Processed RF
C:\FAP10\DATA\0064\0001\:	Kaliganga at Taraghat -3 hourly WL
C:\FAP10\DATA\0064\0003\:	Taraghat - 24 h forecast
C:\FAP10\DATA\0064\0004\:	Taraghat - 48 h forecast
C:\FAP10\DATA\0064\0005\:	Taraghat - 72 h forecast
C:\FAP10\DATA\0064\0002\:	Taraghat -Mllupdate WL
C:\FAP10\DATA\0064\0006\:	Taraghat - Databox Raw WL
C:\FAP10\DATA\0065\0001\:	Turag at Tongi -3 hourly WL
C:\FAP10\DATA\0065\0002\:	Tongi -Mllupdate WL
C:\FAP10\DATA\0065\0003\:	Tongi -Telemetry Hourly WL
C:\FAP10\DATA\0065\0004\:	Tongi -24h forecast
C:\FAP10\DATA\0065\0005\:	Tongi -48h forecast
C:\FAP10\DATA\0065\0006\:	Tongi -72h forecast
C:\FAP10\DATA\0067\0001\:	Rainfall at Atrai
C:\FAP10\DATA\0067\0002\:	Atrai at Atrai -3 hourly WL
C:\FAP10\DATA\0067\0003\:	Atrai at Atrai Ghat -Daily WL
C:\FAP10\DATA\0150\0002\:	Karnafully at Kaptai -daily WL
C:\FAP10\DATA\0161\0001\:	Ganges at Farraka -3 hourly WL
C:\FAP10\DATA\0222\0001\:	Brahmaputra at Goalpara -3 hourly WL
C:\FAP10\DATA\0239\0001\:	Brahmaputra at Dhubri -3 hourly WL
C:\FAP10\DATA\0069\0001\:	Karatoya at Chakrahimpur - 3 hourly WL
C:\FAP10\DATA\0069\0002\:	Chakrahimpur -Mllupdate WL
C:\FAP10\DATA\0069\0003\:	Chakrahimpur - 24 hr forecats
C:\FAP10\DATA\0069\0004\:	Chakrahimpur - 48 hr forecast
C:\FAP10\DATA\0069\0005\:	Chakrahimpur - 72 hr forecast
C:\FAP10\DATA\0069\0006\:	Chakrahimpur - Databox Raw WL
C:\FAP10\DATA\0070\0001\:	Arial Khan -Processed Q
C:\FAP10\DATA\0071\0001\:	Rainfall at Badarganj
C:\FAP10\DATA\0071\0002\:	C.Jamuneswari at Badarganj - 3 hourly WL
C:\FAP10\DATA\0071\0003\:	Badarganj -Processed WL
C:\FAP10\DATA\0071\0004\:	Badarganj -Processed Q
C:\FAP10\DATA\0071\0005\:	Badarganj Q - 24h estimate
C:\FAP10\DATA\0071\0006\:	Badarganj Q - 48h estimate
C:\FAP10\DATA\0071\0007\:	Badarganj Q - 72h estimate
C:\FAP10\DATA\0071\0008\:	Badarganj -Processed RF
C:\FAP10\DATA\0071\0009\:	Badarganj - Databox Raw WL

C:\FAP10\DATA\0071\0010\:	Badarganj - Databox Raw RF
C:\FAP10\DATA\0072\0001\:	Kangsha at Jariajanjail -Daily WL
C:\FAP10\DATA\0072\0002\:	Jariajanjail -Mllupdate WL
C:\FAP10\DATA\0072\0003\:	Jariajanjail - 3 hourly WL
C:\FAP10\DATA\0072\0004\:	Rainfall at Jariajanjail
C:\FAP10\DATA\0072\0005\:	Jariajanjail - 24 h forecast
C:\FAP10\DATA\0072\0006\:	Jariajanjail - 48 h forecast
C:\FAP10\DATA\0072\0007\:	Jariajanjail - 72 h forecast
C:\FAP10\DATA\0072\0008\:	Jariajanjail - Processed RF
C:\FAP10\DATA\0072\0009\:	Jariajanjail - Databox Raw WL
C:\FAP10\DATA\0072\0010\:	Jariajanjail - Databox Raw RF
C:\FAP10\DATA\0073\0001\:	Atrai at Mohadevpur - 3 hourly WL
C:\FAP10\DATA\0073\0002\:	Mohadevpur -Mllupdate WL
C:\FAP10\DATA\0073\0003\:	Rainfall at Mohadevpur
C:\FAP10\DATA\0073\0004\:	Mohadebpur -Processed RF
C:\FAP10\DATA\0073\0005\:	Mohadevpur - Databox Raw WL
C:\FAP10\DATA\0073\0006\:	Mohadevpur - Databox Raw RF
C:\FAP10\DATA\0073\0010\:	Mohadevpur - 24 hr forecast
C:\FAP10\DATA\0073\0011\:	Mohadevpur - 48 hr forecast
C:\FAP10\DATA\0073\0012\:	Mohadevpur - 72 hr forecast
C:\FAP10\DATA\0074\0001\:	Ich-Jamuna at Phulbari - 3 hourly WL
C:\FAP10\DATA\0074\0002\:	Phulbari -Processed WL
C:\FAP10\DATA\0074\0003\:	Phulbari - 24 h estimate
C:\FAP10\DATA\0074\0004\:	Phulbari - 48 h estimate
C:\FAP10\DATA\0074\0005\:	Phulbari - 72 h estimate
C:\FAP10\DATA\0074\0006\:	Phulbari - Databox Raw WL
C:\FAP10\DATA\0075\0001\:	Mohanada at Rohanpur -Daily WL
C:\FAP10\DATA\0075\0002\:	Rohanpur -Processed WL
C:\FAP10\DATA\0075\0006\:	Rohanpur - Databox Raw WL
C:\FAP10\DATA\0075\0007\:	Rohanpur - Databox Raw RF
C:\FAP10\DATA\0075\0008\:	Rainfall at Rohanpur
C:\FAP10\DATA\0075\0009\:	Mohananda at Rohanpur - 3 hourly WL
C:\FAP10\DATA\0075\0010\:	Rohanpur - 24h estimate
C:\FAP10\DATA\0075\0011\:	Rohanpur - 48h estimate
C:\FAP10\DATA\0075\0012\:	Rohanpur - 72h estimate
C:\FAP10\DATA\0075\0013\:	Rohanpur -Processed RF
C:\FAP10\DATA\0076\0001\:	Sarigowain at Sarighat -Daily WL
C:\FAP10\DATA\0076\0002\:	Sarighat -Processed WL
C:\FAP10\DATA\0076\0003\:	Sarighat -Processed Q
C:\FAP10\DATA\0076\0004\:	Sarighat - Scaled for Jafflong/A_Piyan - Processed Q
C:\FAP10\DATA\0076\0005\:	Sarigowain at Sarighat - 3 hourly WL
C:\FAP10\DATA\0076\0006\:	Sarighat - 24 h estimate
C:\FAP10\DATA\0076\0007\:	Sarighat - 48 h estimate
C:\FAP10\DATA\0076\0008\:	Sarighat - 72 h estimate
C:\FAP10\DATA\0076\0009\:	Sarighat - Scaled for Jafflong/A_Piyan - 24 h estimate
C:\FAP10\DATA\0076\0010\:	Sarighat - Scaled for Jafflong/A_Piyan - 48 h estimate
C:\FAP10\DATA\0076\0011\:	Sarighat - Scaled for Jafflong/A_Piyan - 72 h estimate
C:\FAP10\DATA\0076\0012\:	Sarighat - Databox Raw WL
C:\FAP10\DATA\0077\0001\:	Sherpur - Mllupdate WL
C:\FAP10\DATA\0077\0003\:	Sherpur -Telemetry Hourly WL
C:\FAP10\DATA\0077\0005\:	Sherpur - 24 h forecast
C:\FAP10\DATA\0077\0006\:	Sherpur - 48 h forecast
C:\FAP10\DATA\0077\0007\:	Sherpur - 72 h forecast
C:\FAP10\DATA\0078\0001\:	Q=0 Processed Q
C:\FAP10\DATA\0078\0002\:	Q=10 Processed Q
C:\FAP10\DATA\0078\0003\:	Q=2 Processed Q
C:\FAP10\DATA\0078\0004\:	Dhepa-Art -Processed WL
C:\FAP10\DATA\0078\0005\:	North Central EVP
C:\FAP10\DATA\0078\0006\:	North East EVP
C:\FAP10\DATA\0078\0007\:	North West EVP
C:\FAP10\DATA\0078\0008\:	NW (North) Regional Rainfall
C:\FAP10\DATA\0078\0009\:	NW (South) Regional Rainfall
C:\FAP10\DATA\0078\0010\:	NC (North) Regional Rainfall
C:\FAP10\DATA\0078\0011\:	NC (South) Regional Rainfall
C:\FAP10\DATA\0078\0012\:	NE (North) Regional Rainfall
C:\FAP10\DATA\0078\0013\:	NE (South) Regional Rainfall
C:\FAP10\DATA\0078\0015\:	Southern Region Regional Rainfall
C:\FAP10\DATA\0080\0001\:	Barak at Jilchar - 3 hourly WL
C:\FAP10\DATA\0079\0001\:	Tista at Domohani Rly Br - 3 hourly WL
C:\FAP10\DATA\0082\0001\:	Rekabi Bazar -Telemetry Hourly WL
C:\FAP10\DATA\0083\0001\:	Zakiganj -Telemetry Hourly WL
C:\FAP10\DATA\0083\0002\:	Zakiganj -Telemetry Rainfall
C:\FAP10\DATA\0084\0001\:	Shalstaganj -Telemetry Hourly WL
C:\FAP10\DATA\0085\0001\:	Dhalai -Telemetry Hourly WL
C:\FAP10\DATA\0086\0001\:	Kamalganj -Telemetry Rainfall

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C:\FAP10\DATA\0088\0001\:       Dhepa (16.75) at Kantanagar - Mean daily water level
C:\FAP10\DATA\0089\0001\:       mean daily water level (Punarbhaba 0.0)
C:\FAP10\DATA\0090\0001\:       Mean daily water level (Punarb. 48.25)
C:\FAP10\DATA\0090\0002\:       Mean daily Q
C:\FAP10\DATA\0091\0001\:       Mean daily water level (Koratoa-Atrai, 120.0)
C:\FAP10\DATA\0092\0001\:       Mean daily water level (Koratoa-Atrai , 90.0)
C:\FAP10\DATA\0093\0001\:       Bhugai at Nakugaon - 3 hourly WL
C:\FAP10\DATA\0093\0002\:       Rainfall at Nakugaon
C:\FAP10\DATA\0093\0003\:       Nakugaon - Processed WL
C:\FAP10\DATA\0093\0004\:       Nakugaon - Processed RF
C:\FAP10\DATA\0093\0005\:       Nakugaon - 24h estimate
C:\FAP10\DATA\0093\0006\:       Nakugaon - 48 h estimate
C:\FAP10\DATA\0093\0007\:       Nakugaon - 72 h estimate
C:\FAP10\DATA\0093\0008\:       Nakugaon - Processed Q
C:\FAP10\DATA\0093\0009\:       Nakugaon - Databox Raw WL
C:\FAP10\DATA\0093\0010\:       Nakugaon - Databox Raw RF
C:\FAP10\DATA\0094\0001\:       Jadukata at Lourergorh - 3 hourly WL
C:\FAP10\DATA\0094\0002\:       Rainfall at Lourergorh
C:\FAP10\DATA\0094\0003\:       Lourergorh - Processed WL
C:\FAP10\DATA\0094\0004\:       Lourergorh - Processed RF
C:\FAP10\DATA\0094\0005\:       Lourergorh - Processed Q
C:\FAP10\DATA\0094\0006\:       Lourergorh - Scaled for Active_Chela - Processed Q
C:\FAP10\DATA\0094\0007\:       Lourergorh - Scaled for Dhalagang - Processed Q
C:\FAP10\DATA\0094\0008\:       Lourergorh - Scaled for Nawagang - Processed Q
C:\FAP10\DATA\0094\0009\:       Lourergorh - Scaled for Jhalukhali - Processed Q
C:\FAP10\DATA\0094\0010\:       Lourergorh - 24 h estimate
C:\FAP10\DATA\0094\0011\:       Lourergorh - 48 h estimate
C:\FAP10\DATA\0094\0012\:       Lourergorh - 72 h estimate
C:\FAP10\DATA\0094\0013\:       Lourergorh - Scaled for Active_Chela -24 h estimate
C:\FAP10\DATA\0094\0014\:       Lourergorh - Scaled for Active_Chela  -48 h estimate
C:\FAP10\DATA\0094\0015\:       Lourergorh - Scaled for Active_Chela -72 h estimate
C:\FAP10\DATA\0094\0016\:       Lourergorh - Scaled for Dhalagang - 24 h estimate
C:\FAP10\DATA\0094\0017\:       Lourergorh - Scaled for Dhalagang - 48 h estimate
C:\FAP10\DATA\0094\0018\:       Lourergorh - Scaled for Dhalagang - 72 h estimate
C:\FAP10\DATA\0094\0019\:       Lourergorh - Scaled for Nawagang - 24 h estimate
C:\FAP10\DATA\0094\0020\:       Lourergorh - Scaled for Nawagang - 48 h estimate
C:\FAP10\DATA\0094\0021\:       Lourergorh - Scaled for Nawagang - 72 h estimate
C:\FAP10\DATA\0094\0022\:       Lourergorh - Scaled for Jhalukhali - 24 h estimate
C:\FAP10\DATA\0094\0023\:       Lourergorh - Scaled for Jhalukhali - 48h estimate
C:\FAP10\DATA\0094\0024\:       Lourergorh - Scaled for Jhalukhali - 72 h estimate
C:\FAP10\DATA\0094\0025\:       Lourergorh - Databox Raw WL
C:\FAP10\DATA\0094\0026\:       Lourergorh - Databox Raw RF
```

NOTE – To produce this listing, run SEN-LIST.BAT in the DATA directory. Some post editing is required.

Appendix C

The Interpolation Specifications and Configuration file for the Pre-Processing of Databox Data for the super Model

Rainfall

InterpolationMethod	Input from Databox	Required Output	Accumulate *From*	*To*	Output Reading
RF1	Hourly (6-21)	Hourly (6-21)	0631 prev	0730 pres	0700 pres
			0731 prev	0830 pres	0800 pres
			0831 prev	0930 pres	0900 pres
			.	.	.
			.	.	.
			2131 prev	0630 pres	0600 pres
RF2	Hourly (24 hr)	Hourly (24hr)	As Method 1, but continue after 2100		
		Last accumulation is:	0531 pres	0630 pres	0600 pres
RF3	Hourly (6-21 or 24hr)	Daily	0631 prev	0630 pres	0600 pres
RF4	3 hourly (6-18)	3 hourly	0731 prev	1030 prev	0900 prev
			1031 prev	1330 prev	1200 prev
			1331 prev	1630 prev	1500 prev
			1631 prev	1930 prev	1800 prev
			1931 prev	0730 pres	0600 pres
RF5	3 hourly	3 hourly	0731 prev	1030 prev	0900 prev

	(6-21)		1031 prev	1330 prev	1200 prev
			1331 prev	1630 prev	1500 prev
			1631 prev	1930 prev	1800 prev
			1931 prev	2230 prev	2100 prev
			2231 prev	0730 pres	0600 pres
RF6	3 hourly (6-18 or 6-21)	Daily	0731 prev	0730 pres	0600 pres
RF7	Daily	Daily	0300 prev	01200 pres	0600 pres

Water Levels

InterpolationMethod WL1: 3 hourly, 0600-1800
InterpolationMethod WL2: 3 hourly, 0600-2100
InterpolationMethod WL3: Hourly, 0600-2100
InterpolationMethod WL4: Hourly, 24hrs

Magicnv6.cnv for the Supermodel

```
StartTime=1997/4/1/6
StopTime=1997/7/1/6
FFm11Dir=c:\fap10\magic
StationList
#
# This file is used to transfer RAW DataBox Data into corresponding DataBox Sensors,
# and is also used by the interpolation/accumulation program, ffinterp.
# First the Water Levels
#
InterpolationMethod WL1
# This is for 3 hourly data, 0600-1800
Station \FAP10\DATA\0002\0002  9000001 WL water_level Aricha - Databox Raw WL
Station \FAP10\DATA\0071\0009  9000002 WL water_level Badarganj - Databox Raw WL
Station \FAP10\DATA\0003\0008  9000003 WL water_level Bahadurabad - Databox Raw WL
Station \FAP10\DATA\0006\0007  9000004 WL water_level Bhagyakul - Databox Raw WL
Station \FAP10\DATA\0007\0009  9000005 WL water_level Bhairab Bazar - Databox Raw WL
Station \FAP10\DATA\0008\0008  9000007 WL water_level Bogra - Databox Raw WL
Station \FAP10\DATA\0069\0006  9000008 WL water_level Chakrahimpur - Databox Raw WL
Station \FAP10\DATA\0010\0009  9000010 WL water_level Chapai Nawabganj - Databox Raw WL
Station \FAP10\DATA\0011\0007  9000011 WL water_level Chilmari - Databox Raw WL
Station \FAP10\DATA\0016\0006  9000012 WL water_level Dalia - Databox Raw WL water_level
Station \FAP10\DATA\0021\0012  9000014 WL water_level Durgapur - Databox Raw WL
Station \FAP10\DATA\0023\0008  9000015 WL water_level Gaibanda - Databox Raw WL
Station \FAP10\DATA\0024\0008  9000016 WL water_level Goalundo - Databox Raw  WL
Station \FAP10\DATA\0025\0008  9000017 WL water_level Gorai Rly Brg - Databox Raw WL
Station \FAP10\DATA\0027\0008  9000018 WL water_level Hardinge Brg - Databox Raw WL
Station \FAP10\DATA\0028\0006  9000019 WL water_level Jagir - Databox Raw WL
Station \FAP10\DATA\0029\0009  9000020 WL water_level Jamalpur - Databox Raw WL
Station \FAP10\DATA\0072\0009  9000021 WL water_level Jariajanjail - Databox Raw WL
Station \FAP10\DATA\0031\0003  9000022 WL water_level Kanaighat - Databox Raw WL
Station \FAP10\DATA\0032\0010  9000023 WL water_level Kaunia - databox Raw WL
Station \FAP10\DATA\0034\0009  9000024 WL water_level Kurigram - Databox Raw WL water_level
Station \FAP10\DATA\0094\0025  9000025 WL water_level Lourergorh - Databox Raw WL
Station \FAP10\DATA\0037\0017  9000026 WL water_level Manu RB - Databox Raw WL
Station \FAP10\DATA\0040\0009  9000029 WL water_level Mymensingh - Databox Raw  WL
```


```
Station \FAP10\DATA\0093\0009  9000030 WL water_level Nakugaon - Databox Raw WL
Station \FAP10\DATA\0041\0008  9000031 WL water_level Naogaon - Databox raw WL
Station \FAP10\DATA\0050\0008  9000033 WL water_level Pankha - Databox Raw WL
Station \FAP10\DATA\0074\0006  9000034 WL water_level Phulbari - Databox Raw WL water_level
Station \FAP10\DATA\0053\0008  9000035 WL water_level Rajshahi - Databox Raw WL water_level
Station \FAP10\DATA\0076\0012  9000037 WL water_level Sarighat - Databox Raw WL
Station \FAP10\DATA\0059\0009  9000038 WL water_level Serajganj - Databox Raw WL
Station \FAP10\DATA\0060\0009  9000039 WL water_level Sheola - Databox Raw WL
Station \FAP10\DATA\0061\0008  9000040 WL water_level Sunamganj - Databox Raw WL
Station \FAP10\DATA\0062\0009  9000041 WL water_level Sylhat - Databox Raw WL
Station \FAP10\DATA\0064\0006  9000042 WL water_level Taraghat - Databox Raw WL
InterpolationMethod2 WL2
# This is for 3 hourly data, 0600-2100
Station \FAP10\DATA\0019\0004  9000013 WL water_level Dinajpur - Databox Raw WL
Station \FAP10\DATA\0048\0010  9000032 WL water_level Panchagarh - Databox Raw WL
Station \FAP10\DATA\0075\0006  9000036 WL water_level Rohanpur - Databox Raw WL
Station \FAP10\DATA\0073\0005  9000027 WL water_level Mohadevpur - Databox Raw WL
Station \FAP10\DATA\0081\0007  9000006 WL water_level Bhusirbandar - Databox Raw WL
InterpolationMethod2 WL3
# This is for hourly data, 0600-2100
Station \FAP10\DATA\0039\0003  9000028 WL water_level Moulvi Bazar - Databox Raw WL
Station \FAP10\DATA\0037\0017  9000026 WL water_level Manu RB - Databox Raw WL
InterpolationMethod2 WL4
# This is for hourly data, 24 hrs a day
Station \FAP10\DATA\0009\0010  9000009 WL water_level Chandpur - Databox Raw WL
#
#
# Then the Rainfalls
#
InterpolationMethod RF3
# This accumulates hourly data to daily
Station \FAP10\DATA\0037\0018  8000026 RF rainfall Manu RB - Databox Raw RF
Station \FAP10\DATA\0039\0011  8000028 RF rainfall Moulvi Bazar - Databox Raw RF
```

```
InterpolationMethod RF6
# This accumulates 3 hourly rainfall to daily
Station \FAP10\DATA\0019\0005  8000013 RF rainfall Dinajpur - Databox Raw RF
Station \FAP10\DATA\0048\0011  8000032 RF rainfall Panchagarh - Databox Raw RF
Station \FAP10\DATA\0016\0007  8000012 RF rainfall Dalia - Databox Raw RF
InterpolationMethod RF7
# This accumulates daily rainfall to daily
Station \FAP10\DATA\0071\0010  8000002 RF rainfall Badarganj - Databox Raw RF
Station \FAP10\DATA\0003\0009  8000003 RF rainfall Bahadurabad - Databox Raw RF
Station \FAP10\DATA\0007\0010  8000005 RF rainfall Bhairab bazar - Databox Raw RF
Station \FAP10\DATA\0008\0009  8000007 RF rainfall Bogra - Databox Raw RF
Station \FAP10\DATA\0009\0011  8000009 RF rainfall Chandpur - Databox Raw RF
Station \FAP10\DATA\0010\0010  8000010 RF rainfall Chapai Nawabganj - Databox Raw RF
Station \FAP10\DATA\0011\0009  8000011 RF rainfall Chilmari - Databox Raw RF
Station \FAP10\DATA\0021\0013  8000014 RF rainfall Durgapur - Dtabox Raw RF
Station \FAP10\DATA\0023\0009  8000015 RF rainfall Gaibanda - Databox Raw RF
Station \FAP10\DATA\0029\0010  8000020 RF rainfall Jamalpur - Databox Raw RF
Station \FAP10\DATA\0072\0010  8000021 RF rainfall Jariajanjail - Databox Raw RF
Station \FAP10\DATA\0031\0009  8000022 RF rainfall Kanaighat - Databox Raw RF
Station \FAP10\DATA\0032\0011  8000023 RF rainfall Kaunia - Databox Raw RF
Station \FAP10\DATA\0034\0010  8000024 RF rainfall Kurigram - Dtabox Raw RF
Station \FAP10\DATA\0094\0026  8000025 RF rainfall Lourergorh - Databox Raw RF
Station \FAP10\DATA\0073\0006  8000027 RF rainfall Mohadevpur - Databox Raw RF
Station \FAP10\DATA\0040\0010  9000029 RF rainfall Mymensingh - Databox Raw RF
Station \FAP10\DATA\0093\0010  8000030 RF rainfall Nakugaon - Databox Raw RF
Station \FAP10\DATA\0041\0009  8000031 RF rainfall Naogaon - Databox Raw RF
Station \FAP10\DATA\0053\0009  8000035 RF rainfall Rajshahi - Databox Raw RF
Station \FAP10\DATA\0075\0007  8000036 RF rainfall Rohanpur - Databox Raw RF
Station \FAP10\DATA\0059\0010  8000038 RF rainfall Serajganj - Databox Raw RF
Station \FAP10\DATA\0060\0010  8000039 RF rainfall Sheola  - Databox Raw RF rainfall
Station \FAP10\DATA\0061\0009  8000040 RF rainfall Sunamganj - Databox Raw RF
Station \FAP10\DATA\0062\0010  8000041 RF rainfall Sylhet - Databox Raw RF rainfall

StationsEnd
```

Reports

Following reports has been issued up to June 1996:

• Inception Report	: January to May 1995	(August 1995)
• Progress Report No. 1	: June to September 1995	(Oct. 1995)
• Progress Report No. 2	: October to December 1995	(January 1996)
• Progress Report No. 3	: January to March 1996	(April 1996)

In addition some special reports has been issued. A complete list of reports is enclosed as Annex 8.

Review

The yearly Danida review is scheduled to take place from 25 August 1996. The review was originally planned in January 1996. However, due to the unforseen tense political situation in Bangladesh and other reasons the review has been postponed 7 month.