

**Endurskoðun HBV líkans af vhm 231 í  
Hólmsá**

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**Greinargerð GOG-2003-03**



## Endurskoðun HBV líkans af vhm 231 í Hólmsá

### Inngangur

Árið 2000 var gert HBV líkan af vhm 231 í Hólmsá í Skaftártungu, sbr. [Gunnar Orri Gröndal, 2000]. Í mörgum tilfellum reyndist talsvert mikill munur á lágrennsli skv. því líkani og mælingum. Í þeirri athugun sem hér er til umfjöllunar var reynt að endurbæta líkanið með því að fella lágrennsli í líkaninu betur að raunverulegum mælingum, og einnig var gerð athugun á því hvort verulegur munur væri á tölfræðilegum eiginleikum mældu rennslisraðarinnar og líkansins.

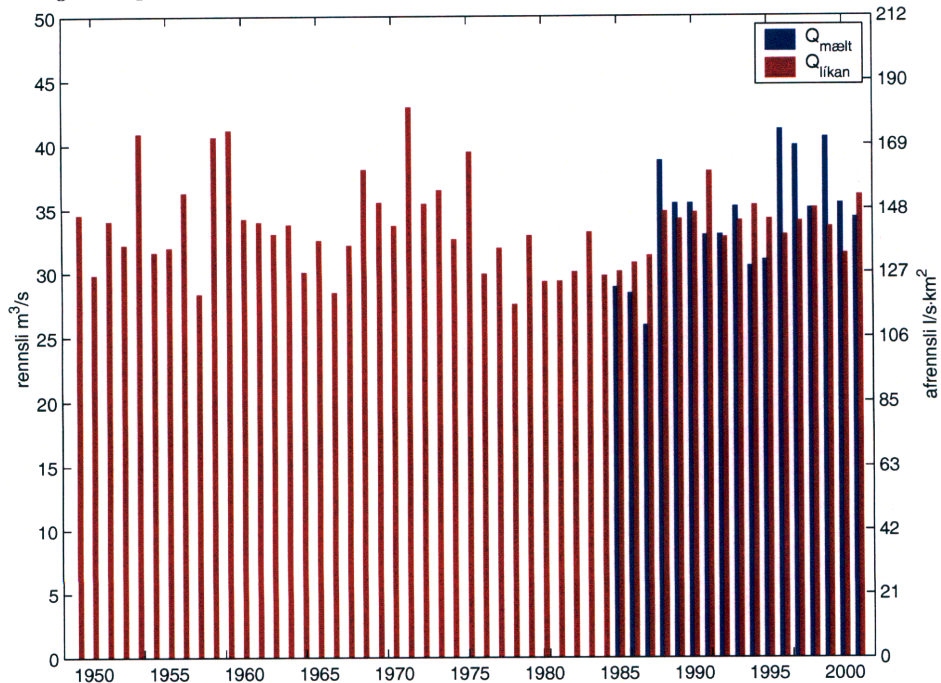
### Niðurstaða

Það reyndist unnt að fella líkanið ögn betur að mældu rennsli við vhm 231. Aðlögunarstuðlarnir R2 og R2log hækka lítillega þegar á heildina er lítið, og vatnsjöfnuður er nær því en áður að vera réttur, sbr. töflu 1 hér að neðan og töflu 1 í [Gunnar Orri Gröndal, 2000]. Mynd 1 sýnir samanburð á meðalrennsli heillra vatnsára við vhm 231 skv. mælingum og líkani. Meðalrennsli á samanburðartímabilinu er hið sama, en breytileiki meðalrennslisins virðist vera nokkru minni í líkaninu. Þannig var ársmeðalrennslið þrisvar undir 30

Tafla 1: Vatnsjöfnuður og fylgni í HBV líkani af vhm 231. Aðlögunartímabil er feitletrað.  $Q_{r*}$  táknar meðalrennsli heillra vatnsára skv. HBV líkani.

vatnsár	$Q_m$ [m <sup>3</sup> /s]	$Q_r$ [m <sup>3</sup> /s]	hlfl. msm.	$Q_{r*}$ [m <sup>3</sup> /s]	R2	R2log
1984/85	28.8	29.2	0.013	29.7	0.340	0.546
1985/86	29.3	30.5	0.043	30.1	0.341	0.568
<b>1986/87</b>	28.6	31.0	0.085	30.8	0.369	0.592
<b>1987/88</b>	26.4	31.8	0.204	31.3	0.089	0.144
<b>1988/89</b>	39.9	35.7	-0.105	34.8	0.589	0.669
<b>1989/90</b>	36.4	35.3	-0.031	34.2	0.577	0.738
1990/91	35.8	35.1	-0.020	34.7	-0.066	0.173
1991/92	33.5	38.6	0.153	38.0	0.012	0.320
1992/93	35.3	35.9	0.017	32.8	0.493	0.613
1993/94	36.0	35.1	-0.028	34.1	0.237	0.485
1994/95	32.0	37.1	0.161	35.3	-0.193	0.423
1995/96	31.3	34.5	0.103	34.2	0.070	0.088
1996/97	44.6	36.0	-0.194	32.9	0.138	0.041
1997/98	40.3	34.8	-0.137	34.0	0.424	0.398
1998/99	35.7	35.6	-0.004	35.1	0.254	0.348
1999/00	47.9	38.0	-0.206	33.6	-0.832	-1.180
2000/01	36.7	32.8	-0.012	31.4	-0.100	0.092
2001/02	37.9	37.6	-0.007	36.1	0.230	0.308
meðal	34.5	34.5	-0.001	33.5	0.341	0.471

Mynd 1: Meðalrennsli og meðalafrennsli af vatnasviði vhm 231 skv. mælingum og endurskoðuðu HBV líkani.

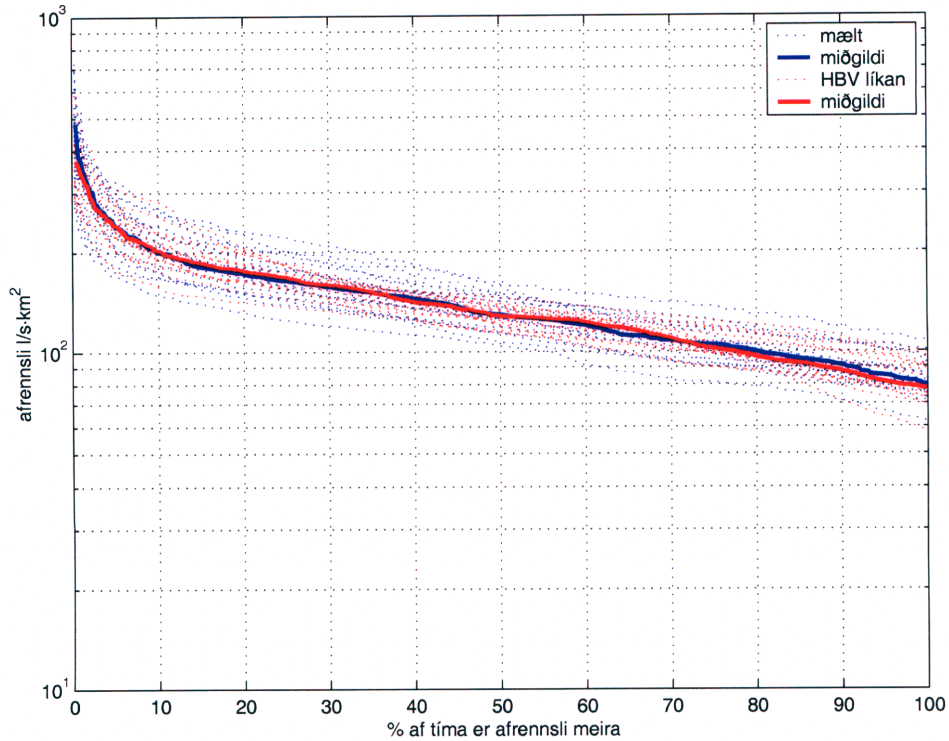


m<sup>3</sup>/s og þrisvar yfir 40 m<sup>3</sup>/s skv. mælingum, samanborið við líkan sem er yfirleitt nálægt 34 m<sup>3</sup>/s á samanburðartímabilinu. Þetta bendir til að HBV líkanið taki ekki að öllu leyti tillit til þeirra þátta sem stjórna afrennsli af vatnasviði Hólmsár. Langæislínun mælinga og líkans ber all vel saman, eins og mynd 2 sýnir, en líkanið er þó til jafnaðar ívið íhaldssamara þegar kemur að lágrennsli. Líkanið virðist ná að herma vel eftir megin einkennum rennslisins, og ætti því að geta nýst vel við mat á langtíma afrennsli af vatnasviði Hólmsár. Hin nýja rennslisröð fyrir vhm 231 er vistuð undir númerinu 30231 á tölvukerfi Orkustofnunar og jafnframt sem rennslisröð R154 í gagnabanka Rennslisgagnanefndar undir númerinu 90154.

Reykjavík, 27. ágúst 2003

Gunnar Orri Gröndal

Mynd 2: Langæislínur afrennslis skv. mælingum og HBV líkani, vatnsárin 1984/85 til 2001/02.



### Tilvísanir

Gunnar Orri Gröndal, 2000. *Hólmsá í Skaftártungu. Gerð HBV-rennslislíkans af vhm 231.* OS-2000/042

**Viðauki I: Stuðlaskrá**

Skráin /vm/hbv/gog/231/lagrennsli/param.dat.

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START 2V231
2 0 4 PNO Number of precipitation stations
2 0 Klaustur PID1 Identification for precip station 1
2 0 32. PHOH1 Altitude precip station 1
2 0 0.58 PWGT1 Weight precipitation station 1
2 0 Vatnskholar PID2
2 0 20. PHOH2
2 0 0.42 PWGT2
2 0 Storhofði PID3
2 0 118. PHOH3
2 0 0.0 PWGT3
2 0 Hæll PID4
2 0 121. PHOH4
2 0 0.00 PWGT4
2 0 4 TNO Number of temperature stations
2 0 Klaustur TID1 Identification for temp station 1
2 0 32. THOH1 Altitude temp station 1
2 0 .30 TWGT1 Weight temp station 1
2 0 Vatnskholar TID2
2 0 20. THOH2
2 0 .30 TWGT3
2 0 Storhöfði TID3
2 0 118. THOH3
2 0 .00 TWGT3
2 0 Hæll TID4
2 0 121. THOH4
2 0 .40 TWGT4
2 0 1 QNO Number of discharge stations
2 0 vhm231 QID Identification for discharge station
2 0 1. QWGT Scaling factor for discharge
2 0 236.26 AREAL Catchment area [km2]
2 4 0.000 MAGDEL Regulation reservoirs [1]
2 5 170.000 HYPSO ( 1,1), low point [m]
2 6 250.000 HYPSO ( 2,1)
2 7 350.000 HYPSO ( 3,1)
2 8 500.000 HYPSO ( 4,1)
2 9 600.000 HYPSO ( 5,1)
2 10 700.000 HYPSO ( 6,1)
2 11 800.000 HYPSO ( 7,1)
2 12 900.000 HYPSO ( 8,1)
2 13 1000.000 HYPSO ( 9,1)
2 14 1150.000 HYPSO (10,1)
2 15 1300.000 HYPSO (11,1), high point
2 16 0.000 HYPSO ( 1,2), Part of total area below HYPSO (1,1) = 0
2 17 0.017 HYPSO ( 2,2)
2 18 0.060 HYPSO ( 3,2)
2 19 0.225 HYPSO ( 4,2)
2 20 0.521 HYPSO ( 5,2)
2 21 0.710 HYPSO ( 6,2)
2 22 0.809 HYPSO ( 7,2)
2 23 0.879 HYPSO ( 8,2)
2 24 0.926 HYPSO ( 9,2)
2 25 0.987 HYPSO (10,2)
2 26 1.000 HYPSO (11,2), Part of total area below HYPSO (11,1) = 1
2 27 0.000 BREPRO( 1), Glacier area, part of total area, below HYPSO( 1,1) (=0.0)
2 28 0.000
2 29 0.000
2 30 0.000
2 31 0.001
2 32 0.029
2 33 0.088
2 34 0.129
2 35 0.162
2 36 0.204

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2 37 0.213 BREPRO(11), Glacier area, part of total area, below HYP50(11,1)  
 2 38  
 2 39 245.000 NDAG Day no for conversion of glacier snow to ice  
 2 40 0.6 TX Threshold temperature for snow/ice [C]  
 2 41 -1.40 TS Threshold temperature fo no melt [C]  
 2 42 3.000 CX Melt index [mm/deg/day]  
 2 43 0.03 CFR Refreeze efficiency [1]  
 2 44 0.06 LV Max rel. water content in snow [1]  
 2 45 1.665 PKORR Precipitaion corection for rain [1]  
 2 46 1.25 SKORR Additional precipitation corection for snow at gauge [1]  
 2 47 800.000 GRADALT Altitude for change in prec. grad. [m]  
 2 48 0.20 PGRAD1 Precipitation gradient above GRADALT [1]  
 2 49 0.03 CALB Ageing factor for albedo [1/day]  
 2 50 0.40 CRAD Radiation melt component [1]  
 2 51 0.60 CONV Convection melt component [1]  
 2 52 0.00 COND Condensation melt component [1]  
 2 60 1.0 CEVPL lake evapotranspiration adjustment fact [1]  
 2 61 0.9 ERED evapotranspiration red. during interception [1]  
 2 62 30.0 ICEDAY Lake temperature time constant [d]  
 2 63 -0.64 TTGRAD Temperature gradient for days without precip [deg/100 m]  
 2 64 -0.52 TVGRAD Temperature gradient for days with precip [deg/100 m]  
 2 65 0.107 PGRAD Precipitation altitude gradient [1/100 m]  
 2 66 1.25 CBRE Melt increase on glacier ice [1]  
 2 67 0.100 EP EP( 1), Pot evapotranspiration, Jan [mm/day] or [1]  
 2 68 0.300 EP EP( 2), Pot evapotranspiration, Feb [mm/day] or [1]  
 2 69 1.000 EP EP( 3)  
 2 70 1.600 EP EP( 4)  
 2 71 2.900 EP EP( 5)  
 2 72 3.400 EP EP( 6)  
 2 73 3.400 EP EP( 7)  
 2 74 2.500 EP EP( 8)  
 2 75 1.300 EP EP( 9)  
 2 76 0.300 EP EP(10)  
 2 77 0.000 EP EP(11)  
 2 78 0.000 EP EP(12)), Pot evapotranspiration, Dec [mm/day] or [1]  
 2 79 200.00 FC Maximum soil water content [mm]  
 2 80 0.5 FCDEL Pot.evapotr when content = FC\*FCDEL [1]  
 2 81 1.0 BETA Non-linearity in soil water zone [1]  
 2 82 1 INFMAX maximum infiltration capacity [mm/day]  
 2 83  
 2 84  
 2 85 0.160 KUZ2 Quick time constant upper zone [1/day]  
 2 86 50.00 UZ1 Threshold quick runoff [mm]  
 2 87 0.058 KUZ1 Slow time constant upper zone [1/day]  
 2 88 17.0 PERC Percolation to lower zone [mm/day]  
 2 89 0.007 KLZ Time constant lower zone [1/day]  
 2 90 1.00 ROUT (1), Routing constant (lake area, km2)  
 2 91 0.00 ROUT (2), Routing constant (rating curve const)  
 2 92 0.00 ROUT (3), Routing constant (rating curve zero)  
 2 93 0.00 ROUT (4), Routing constant (rating curve exp)  
 2 94 0.00 ROUT (5), Routing constant (drained area ratio)  
 2 95 0.00 DECAY (1), Feedback constant  
 2 96 0.00 DECAY (2), Feedback constant  
 2 97 0.00 DECAY (3), Feedback constant  
 2 98 0.20 CE Evapotranspiration constant [mm/deg/day]  
 2 99 0.00 DRAW "draw up"constant [mm/day]  
 2 100 63.7 LAT Latitude [deg]  
 2 101 -0.45 TGRAD(1) Temperature gradient Jan [deg/100m]  
 2 102 -0.45 TGRAD(2) Temperature gradient Feb [deg/100m]  
 2 103 -0.55 TGRAD(3) Temperature gradient Mar [deg/100m]  
 2 104 -0.6 TGRAD(4) Temperature gradient Apr [deg/100m]  
 2 105 -0.7 TGRAD(5) Temperature gradient May [deg/100m]  
 2 106 -0.8 TGRAD(6) Temperature gradient Jun [deg/100m]  
 2 107 -0.8 TGRAD(7) Temperature gradient Jul [deg/100m]  
 2 108 -0.8 TGRAD(8) Temperature gradient Aug [deg/100m]  
 2 109 -0.8 TGRAD(9) Temperature gradient Sep [deg/100m]  
 2 110 -0.6 TGRAD(10) Temperature gradient Oct [deg/100m]  
 2 111 -0.6 TGRAD(11) Temperature gradient Nov [deg/100m]  
 2 112 -0.45 TGRAD(12) Temperature gradient Dec [deg/100m]  
 2 113 30.0 SPDIST Uniformly distributed snow acc [mm]

2 114 100.0 SMINI Initial soil moisture content [mm]  
 2 115 100.0 UZINI Initial upper zone content [mm]  
 2 116 1200.0 LZINI Initial lower zone content [mm]  
 2 121 3 VEGT(1,1) Vegetation type 1, zone 1  
 2 122 4 VEGT(2,1) Vegetation type 2, zone 1  
 2 123 0.0 VEGA(1) Vegetation 2 area, zone 1 [1]  
 2 124 0.0 LAKE(1) Lake area, zone 1 [1]  
 2 125 1 VEGT(1,2) Vegetation type 1, zone 2  
 2 126 4 VEGT(2,2) Vegetation type 2, zone 2  
 2 127 1.0 VEGA(2) Vegetation 2 area, zone 2 [1]  
 2 128 0.0 LAKE(2) Lake area, zone 2 [1]  
 2 129 3 VEGT(1,3) Vegetation type 1, zone 3  
 2 130 4 VEGT(2,3) Vegetation type 2, zone 3  
 2 131 0.0 VEGA(3) Vegetation 2 area, zone 3 [1]  
 2 132 0.0 LAKE(3) Lake area, zone 3 [1]  
 2 133 4 VEGT(1,4) Vegetation type 1, zone 4  
 2 134 1 VEGT(2,4) Vegetation type 2, zone 4  
 2 135 0.1 VEGA(4) Vegetation 2 area, zone 4 [1]  
 2 136 0.0 LAKE(4) Lake area, zone 4 [1]  
 2 137 4 VEGT(1,5) Vegetation type 1, zone 5  
 2 138 1 VEGT(2,5) Vegetation type 2, zone 5  
 2 139 0.0 VEGA(5) Vegetation 2 area, zone 5 [1]  
 2 140 0.0 LAKE(5) Lake area, zone 5 [1]  
 2 141 4 VEGT(1,6) Vegetation type 1, zone 6  
 2 142 1 VEGT(2,6) Vegetation type 2, zone 6  
 2 143 0.0 VEGA(6) Vegetation 2 area, zone 6 [1]  
 2 144 0.0 LAKE(6) Lake area, zone 6 [1]  
 2 145 4 VEGT(1,7) Vegetation type 1, zone 7  
 2 146 1 VEGT(2,7) Vegetation type 2, zone 7  
 2 147 0.0 VEGA(7) Vegetation 2 area, zone 7 [1]  
 2 148 0.0 LAKE(7) Lake area, zone 7 [1]  
 2 149 4 VEGT(1,8) Vegetation type 1, zone 8  
 2 150 1 VEGT(2,8) Vegetation type 2, zone 8  
 2 151 0.0 VEGA(8) Vegetation 2 area, zone 8 [1]  
 2 152 0.0 LAKE(8) Lake area, zone 8 [1]  
 2 153 4 VEGT(1,9) Vegetation type 1, zone 9  
 2 154 1 VEGT(2,9) Vegetation type 2, zone 9  
 2 155 1.0 VEGA(9) Vegetation 2 area, zone 9 [1]  
 2 156 0.0 LAKE(9) Lake area, zone 9 [1]  
 2 157 4 VEGT(1,10) Vegetation type 1, zone 10  
 2 158 1 VEGT(2,10) Vegetation type 2, zone 10  
 2 159 1.0 VEGA(10) Vegetation 2 area, zone 10 [1]  
 2 160 0.0 LAKE(10) Lake area, zone 10 [1]  
 FINIS



## Viðauki II: Myndir

