

LSNReviews

From: Roland Benke
Sent: Monday, March 14, 2005 6:42 PM
To: Michael Waters; Keith Compton; Donald Hooper; 'Razvan Nes'; Gary Walter; Patrick Laplante; Timothy McCartin; Sitakanta Mohanty; John Trapp; Roland Benke
Cc: Brittain Hill
Subject: TPA parameter evaluation, ASHREMOB module
Attachments: sediment yield pdf (1.68 KB); Y-ash term (1.39 KB)
Importance: High

DOSE2 Team:

The following input parameters coorespond to the new ASHREMOB module.

Thanks to Britt and Don for working with me on the first cut. Changes are noted below separately for each parameter. "OK" is listed after parameters without changes.

I believe Mike will forward a single response for the team to Ron Janetzke by this Friday. Please provide any input to Mike before then.

Roland

>>> Input Parameter Evaluation for the ASHREMOB Module <<<

AshEvolutionMode -- OK

AshPlumeRealizationIndex[]

Note: Razvan is checking if the look-up table is sampled without replacement for each TPA realization.

WeightingFactorInitialDeposit[] -- OK

WeightingFactorFluvial[] -- OK

AmbientSedimentYieldVolumeFromBasin[m/event]

(1) To better reflect the units, change parameter name to

AmbientSedimentYieldVolumePerBasinAreaPerEvent[m/event]

(2) change distribution and values to

usersupplied

AmbientSedimentYieldVolumePerBasinAreaPerEvent[m/event]

27

Note: TPA calculations in the ASHREMOB module for fluvial remobilization of tephra are based on significant flow events with a period specified by a parameter, TimeBetweenFlowEvents[yr], at a new constant value of 4 years.

See the attached email from Britt for more information on the derivation of sediment yield in units of m³/m²-yr, which is then converted to units of m³/m²-event with a multiplication by 4 yr/event to produce the distribution above.

AreaDrainageBasinFluvial[m²] -- OK

TimeBetweenFlowEvents[yr]

Change value to 4.

PostEruptionYieldVolumeFluvialAsh[m/event]

(1) To better reflect the units, change parameter name to

PostEruptionFluvialAshYieldVolumePerAreaPerEvent[m/event]

(2) Make this a correlated parameter with complete correlation to the
AmbientSedimentYieldVolumePerBasinAreaPerEvent[m/event] parameter

(3) The value for this parameter should be set to twice the sampled value for
AmbientSedimentYieldVolumePerBasinAreaPerEvent[m/event]. See Don Hooper's email attached for more
information on the latest relative sediment yield evaluation.

WeightingFactorEolian[] -- OK

DensityOfDistalAsh[g/m3] -- OK

AreaEolianSourceRegion[m2] -- OK

Properties Page

Return-path: <rbenke@cnwra.swri.edu>

Received: from PHOENIX ([129.162.200.28])

by rogain.cnwra.swri.edu (Sun ONE Messaging Server 6.0 (built Oct 29 2003))

with ESMTP id <0IDD002DU5KYGJ20@rogain.cnwra.swri.edu>; Mon,

14 Mar 2005 16:38:58 -0600 (CST)

Date: Mon, 14 Mar 2005 16:41:46 -0600

From: Roland Benke <rbenke@cnwra.swri.edu>

Subject: TPA parameter evaluation, ASHREMOB module

To: 'Michael Waters' <mdw1@nrc.gov>, 'Keith Compton' <KLC@nrc.gov>,

'Donald Hooper' <dhooper@cnwra.swri.edu>, 'Razvan Nes' <rnes@cnwra.swri.edu>,

'Gary Walter' <gwalter@cnwra.swri.edu>,

Patrick Laplante <plaplante@cnwra.swri.edu>, Timothy McCartin <tjm3@nrc.gov>,

Sitakanta Mohanty <smohanty@cnwra.swri.edu>, John Trapp <jst@nrc.gov>,

Roland Benke <rbenke@cnwra.swri.edu>

Cc: Brittain Hill <bhill@cnwra.swri.edu>

Reply-to: rbenke@cnwra.swri.edu

Message-id: <004c01c528e7\$017c7fe0\$1cc8a281@PHOENIX>

MIME-version: 1.0

X-MIMEOLE: Produced By Microsoft MimeOLE V6.00.2800.1441

X-Mailer: Microsoft Outlook CWS, Build 9.0.2416 (9.0.2910.0)

Content-type: multipart/mixed;

boundary="-----_NextPart_000_004D_01C528B4.B6E20FE0"

Importance: High

X-Priority: 1 (Highest)

X-MSMail-priority: High

LSNReviews

From: Brittain Hill [bhill@cnwra.swri.edu]
Sent: Friday, March 11, 2005 5:55 PM
To: Roland Benke; Donald Hooper
Subject: sediment yield pdf
Attachments: sed_yield.csv

Attached is a comma delineated file with the distribution function for Ambient Sediment yield ($\text{m}^3/\text{m}^2 \text{ yr}$), using these uncertainties:

Depositional area: 22-26 km^2
Sediment thickness: 1-2 m
Age of sediments: 4-10 kyr

Using all ranges as uniform and 10,000 realizations, gives the attached distribution.

Results are documented in my sci notebook (#88).

Britt

--

Dr. Brittain E. Hill, P.G. bhill@swri.org
Senior Research Scientist www.swri.org
CNWRA-Southwest Research Institute Ph:(210) 522-6087
6220 Culebra Rd. FAX: 210-522-5155
San Antonio, TX, USA 78238-5166 In Magma Veritas

Sediment	Cumul	
2.50E-06	0	0.00%
3.00E-06	15	0.15%
3.50E-06	229	2.44%
4.00E-06	503	7.47%
4.50E-06	695	14.42%
5.00E-06	904	23.46%
5.50E-06	1000	33.46%
6.00E-06	1029	43.75%
6.50E-06	976	53.51%
7.00E-06	725	60.76%
7.50E-06	702	67.78%
8.00E-06	599	73.77%
8.50E-06	509	78.86%
9.00E-06	394	82.80%
9.50E-06	336	86.16%
1.00E-05	259	88.75%
1.10E-05	252	91.27%
1.10E-05	222	93.49%
1.20E-05	172	95.21%
1.20E-05	145	96.66%
1.30E-05	113	97.79%
1.30E-05	83	98.62%
1.40E-05	66	99.28%
1.40E-05	48	99.76%
1.50E-05	16	99.92%
1.50E-05	7	99.99%
1.60E-05	1	100.00%

LSNReviews

From: Donald Hooper
Sent: Thursday, March 10, 2005 5:33 PM
To: Roland Benke
Subject: Y-ash term

Roland:

Regarding the Y-ash term covering accelerated erosion from the ash-covered portion of the basin, the answer is 2.0 (stats below). Since I used uneven time intervals to plot all 1550 time steps in that graph I showed you, I went back and did a quick interpolation for every 25th time step. This gave me 62 points plus time step 1. Calculations use the mean tephra mass within the watershed.

Minimum	1.0088897 (at 25,336 yrs when the accelerated yield from the more easily eroded tephra matches the ambient yield from the rest of the Fortymile Wash watershed)
Maximum	4.5707656 (actual maximum is 4.5796314 at time step 30 or ~500 yrs after the eruption)
Sum	125.9346
Points	63
Mean	1.9989619 (or 2.0; over the lifetime of the tephra deposit, the mean yield is 2.0 times the ambient yield from the rest of the watershed)
Median	1.6875
RMS	2.2033131
Std Dev.	0.93412571
Variance	0.87259085
Std Error	0.11768878
Skewness	1.1524141
Kurtosis	0.5071316

It seems to me that the shape of this curve will always be the same and 2.0 will be valid. (Perhaps a very large or very small tephra deposit may have a slightly different sediment recovery curve; I'll have to ponder this, but the calculations are derived for a relative sediment yield.) What will change is the duration of this accelerated erosion. But the TPA code can handle that time variable.

-Don

10mar05