

Fact-sheet MORD

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Download: http://www.chr-khr.org/files/CHR_I-23.pdf.

1. General Information	
Model name	MORD (modified version of the MORDOR model proposed by Garçon, 1996)
Version	Proposed by Cemagref (see Mathevret, 2005)
Author(s) / First publication	Mathevret (2005)
Contact person (name, email)	Charles Perrin charles.perrin@cemagref.fr
Institute	Cemagref
Web site	www.cemagref.fr/webgr
General modelling objectives	flow simulation
Domain of applicability (catchment types and climate conditions)	Model version widely tested on French catchments
2. Model description	
Model type (empirical, conceptual, physically-based, others)	Conceptual model
Continuous or event-based	Continuous
Possible running time steps	Daily
Spatial discretization (lumped, semi-distributed, distributed)	Lumped
Short description of model structure detailing main function (evaporation, soil moisture accounting, groundwater, routing, snowmelt, etc.)	<p>The model structure can be divided into a production module and a transfer module.</p> <p>The production module consists of:</p> <ul style="list-style-type: none"> - a correction factor of rainfall - a non linear soil moisture index to determine (i) the part of raw rainfall that will become effective rainfall and (ii) the actual evapotranspiration; - a lower store in which remaining PE acts <p>The transfer module consists of:</p> <ul style="list-style-type: none"> - a direct flow component - an infiltration store - a linear routing store - a unit hydrograph. <p>A degree-day snowmelt module is used for application in catchments influenced by snow.</p>

Scheme of model structure	
	<p>The flowchart illustrates the MORDOR model structure. It starts with Rainfall (X1) entering a Precipitation Input (PI). The output from PI is Rainfall (X1). Rainfall (X1) splits into two paths: one leading to Potential Evapotranspiration (PE), and another leading to a storage box U. Storage box U has an outlet labeled evu. From evu, the flow goes to a storage box L, which has an outlet labeled vs - al. From vs - al, the flow goes to a storage box N, which has an outlet labeled vn. From vn, the flow goes to Streamflow (UH2(X4)). The flow from PE goes to a storage box Z, which has an outlet labeled X10 = 90 mm. From Z, the flow goes to a storage box U. Storage box U has an outlet labeled evz. From evz, the flow goes to a storage box L. Storage box L has an outlet labeled X6. From X6, the flow goes to a storage box N. Storage box N has an outlet labeled an. From an, the flow goes to a storage box N. Storage box N has an outlet labeled X3. From X3, the flow goes to Streamflow (UH2(X4)). The flow from PE also goes to a storage box U. Storage box U has an outlet labeled dtu1. From dtu1, the flow goes to a storage box L. Storage box L has an outlet labeled vs. From vs, the flow goes to a storage box N. Storage box N has an outlet labeled X2. From X2, the flow goes to a storage box N. Storage box N has an outlet labeled 1 - dtz. From 1 - dtz, the flow goes to a storage box N. Storage box N has an outlet labeled rur. From rur, the flow goes to a storage box N. Storage box N has an outlet labeled 0.2. From 0.2, the flow goes to a storage box N. Storage box N has an outlet labeled X3. From X3, the flow goes to Streamflow (UH2(X4)). The flow from PE also goes to a storage box U. Storage box U has an outlet labeled dru1. From dru1, the flow goes to a storage box L. Storage box L has an outlet labeled al. From al, the flow goes to a storage box N. Storage box N has an outlet labeled X2. From X2, the flow goes to a storage box N. Storage box N has an outlet labeled 1 - dtz. From 1 - dtz, the flow goes to a storage box N. Storage box N has an outlet labeled an. From an, the flow goes to a storage box N. Storage box N has an outlet labeled X3. From X3, the flow goes to Streamflow (UH2(X4)).</p>
<u>3. Model parameters</u>	
Distribution of model parameters (yes/no)	No
Number of free parameters	6 free parameters
Procedure of model parameter estimation (measurement, manual or automatic algorithm, etc.)	Automatic calibration
<u>4. Model inputs / Model outputs</u>	
List and characteristics of input variables (type, time step, spatial resolution, etc.)	Daily series of potential evapotranspiration and catchment areal rainfall Daily series of temperature for snowmelt
List and characteristics of output variables (type, time step, spatial resolution, etc.)	Daily streamflow
<u>5. Examples of previous model applications</u>	
Catchments, objectives, etc.	Application on French catchments
Results of existing comparisons with other models	Mathevret (2005) Le Moine (2008) Valéry (2010)
<u>6. List of 5 selected references</u>	
Garçon, R. (1996), Prévision opérationnelle des apports de la Durance à Serre-Ponçon à l'aide du modèle MORDOR, La Houille Blanche, 5, 71-76.	
Mathevret, T., 2005. Quels modèles pluie-débit globaux pour le pas de temps horaire ? Développement empirique et comparaison de modèles sur un large échantillon de bassins versants. Thèse de Doctorat, ENGREF (Paris), Cemagref (Antony), France, 463 pp.	
Le Moine, N., 2008. Le bassin versant de surface vu par le souterrain : une voie d'amélioration des performances et du réalisme des modèles pluie-débit ? Thèse de Doctorat, Université Pierre et Marie Curie, Paris, 324 pp.	
Valéry, A., 2010. Modélisation précipitations – débit sous influence nivale. Élaboration d'un module neige et évaluation sur 380 bassins versants. Thèse de Doctorat, AgroParisTech, Paris, 405 pp.	