CORRECTIONS FOR THE LISTINGS OF THE ECOPATH MODEL

by
J.J. Polovina
Southwest Fisheries Center
Honolulu Laboratory
National Marine Fisheries Service
NOAA, Honolulu, Hawaii 96812, U.S.A.

Network members Drs. D. Pauly and E. Ursin kindly brought to my attention some problems they had with their versions of ECOPATH (see Polovina 1984a, b; Polovina and Ow 1983), particularly when they entered more than one "initial biomass" value. Also, they did not know what ECOPATH actually does with these "excess biomasses".

I made several runs and found that when an excess of biomasses were fixed, two problems arose. In one case a variable was not being completely reinitialized with each new run and in the other case an "if statement" needs to be added to handle the case when a biomass is fixed and there are catch data present for the same species group. Corrections for the listings in Polovina and Ow (1983) are given in the box below.

When there are k fixed biomasses and n-k biomasses to be estimated, ECOPATH solves the simultaneous system of n-k equations which can be expressed as A x B = C, where B is the vector of dimension n-k consisting of only the n-k unknown biomasses, C is the n-k dimensional vector where entry I is the fishery catch of the species group I (with unknown biomass) plus the predation on that species group by all the k species groups with known biomasses. A is the n-k dimensional matrix which determines production, natural mortality and prey-predator relationships within the group of n-k species for which the biomasses are unknown. In other words, when biomasses are fixed the predation from those groups with known biomasses on those groups with unknown biomasses are treated as "catches" and added to the C vector and the rank of the simultaneous system of biomass equations is reduced accordingly. For a species group with known biomass, the only use of that species group in ECOPATH is to determine the predation of that species group on the species groups with unknown biomasses. If both biomasses and catches are entered for the same species group, ECOPATH does not determine if the production and natural mortality of that species group is consistent with the fishing mortality. This is something that could be done and then one of the input parameters for that species group could be estimated.

I would be thankful if Network members let me know if they still have problems after making the code changes in the box below. I am most willing to assist users in their analysis and in the resolution of any problem that may occur.

References

Polovina, J.J. 1984a. An overview of the ECOPATH model. Fishbyte 2(2):5-7.

Polovina, J.J. 1984b. Model of a coral reef ecosystem. Part I. The ECOPATH model and its applications to French Frigate shoals. Coral Reefs 3: 1-11.

Polovina, J.J. and M.D. Ow. 1983. ECOPATH: a user's manual and program listings. Southwest Fish. Cent. Admin. Rep. H82-83 NMFS, Honolulu, 46pp.

Corrections for ECOPATH listings in Polovina and Ow (1983)

- Delete lines 4110,4120,4130 and 4140
- Add the following lines between 4070 and 4080:

```
4071 FOR I = 1 to N
4072 FOR J = 1 to N
4073 AA(I,J) = 0#
4074 IF (I=J) THEN AA(I,J) = 1#
4075 NEXT J
4076 NEXT I
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- Add the following line between 5270 and 5280:

```
5275 IF (NFLAG(I) = 1 AND
CFLAG(I) = 1) THEN B(I)=
OLBD(I)* HABAR(I)
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- Correct spelling of "EQUILIBRIUM" on lines 3920,4790,4800 and 5450