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Surface ozone depletion episodes in the Arctic and Antarctic from historical ozonesonde records

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Abstract. Episodes of ozone depletion in the lowermost Arctic atmosphere (0--2 km) at polar sunrise have been intensively studied at Alert, Canada, and are thought to result from catalytic reactions involving bromine. Recent observations of high concentrations of tropospheric BrO over large areas of the Arctic and Antarctic suggest that such depletion events should also be seen by ozonesondes at other polar stations. An examination of historical ozonesonde records shows that such events occur frequently at Alert, Eureka and Resolute, but much less frequently at Churchill and at other stations. The differences appear to be related to differences in average springtime surface temperatures. The long record at Resolute shows depletions since 1966, but with an increase in their frequency over the period 1966--2000 of 0.66 ± 0.59% per year (95% confidence limits), explaining the apparent increase of Hg in Arctic biota in recent times.

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