國立臺北大學 103 學年度碩士班一般入學考試試題

系（所）組別：自然資源與環境管理所甲、乙組

科　　目：自然資源與環境管理問題評析

☐可 ☑不可使用計算機

一、（20 分）行政院環境保護署於 2013.12.24 公告「環保署預定 102 年 12 月 27 日發布『新店溪青潭自來水水質水量保護區為重要取水口以上集水區』」，其公告內容摘錄如下：

臺北市政府及經濟部水利署臺北水源特定區管理局（水源局）為維護大臺北地區的自來水水質，建議環保署依自來水法第 11 條規定，公告新店溪青潭堰為重要取水口，禁止在取水口以上集水區內養豬。由於此集水區前已完成養豬拆除補償，所以環保署同意辦理新店溪青潭自來水水質水量保護區為重要取水口以上集水區公告事宜，經完成預告及公聽作業等程序，預定於 102 年 12 月 27 日正式發布，發布後在集水區內養豬將可依自來水法第 96 條規定，經制止不理者，處 1 年以下徒刑、拘役或 500 元以下罰金。

自來水法第 11 條第 1 項規定，自來水事業對其水源之保護，除依水利法之規定向水利主管機關申請辦理外，得視事實需要，申請主管機關會商有關機關，劃定公布水質水量保護區，依該法或相關法律規定，禁止或限制貽害水質與水量之行為；另其中貽害水質與水量之行為，包括該法第 11 條第 1 項第 7 款規定所稱「在環境保護主管機關指定公告之重要取水口以上集水區養豬。」

1. 我國現行之「自來水」中央主管機關為經濟部水利署，請問「飲用水」之中央主管機關為何？（4 分）
2. 上述二中央主管機關亦各自掌管水源保護區之劃設，請問該二類保護區名稱又為何？（6 分）
3. 除養豬外，請列舉 5 種可能「貽害水質與水量之行為」（10 分）。

二、（30 分）以下文章摘自 Cubasch, U., D. Wuebbles, D. Chen, M.C. Facchini, D. Frame, N. Mahowald, and J.-G. Winther, 2013: Introduction. In: *Climate Change 2013: The Physical Science Basis*. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, U.K.請以*中文*回答下列問題：

1. 請說明"IPCC"之組織特性及其任務（6 分）。
2. 請問京都議定書（Kyoto Protocol）規範之「溫室氣體 Greenhouse Gases」，除摘錄文章所列之 3 類外，還包括其他那 3 類？（6 分）
3. 請中譯"Human activities are continuing to affect the Earth's energy budget by changing the emissions and resulting atmospheric concentrations of radiatively important gases and aerosols and by changing land surface properties"。（8 分）
4. 請中譯"Observations of CO_2 concentrations, globally averaged temperature and sea level rise are generally well within the range of the extent of the earlier IPCC projections. The recently observed increases in CH_4 and N_2O concentrations are smaller than those assumed in the scenarios in the previous assessments"。（10 分）

Executive Summary

Human Effects on Climate

Human activities are continuing to affect the Earth's energy budget by changing the emissions and resulting atmospheric concentrations of radiatively important gases and aerosols and by changing land surface properties. Previous assessments have already shown through multiple lines of evidence that the climate is changing across our planet, largely as a result of human activities. The most compelling evidence of climate change derives from observations of the atmosphere, land, oceans and cryosphere. Unequivocal evidence from *in situ* observations and ice core records shows that the atmospheric concentrations of important greenhouse gases such as carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) have increased over the last few centuries. {1.2.2, 1.2.3}

The processes affecting climate can exhibit considerable natural variability. Even in the absence of external forcing, periodic and chaotic variations on a vast range of spatial and temporal scales are observed. Much of this variability can be represented by simple (e.g., unimodal or power law) distributions, but many components of the climate system also exhibit multiple states—for instance, the glacial–interglacial cycles and certain modes of internal variability such as El Niño-Southern Oscillation (ENSO). Movement between states can occur as a result of natural variability, or in response to external forcing. The relationship among variability, forcing and response reveals the complexity of the dynamics of the climate system: the relationship between forcing and response for some parts of the system seems reasonably linear; in other cases this relationship is much more complex. {1.2.2}

Multiple Lines of Evidence for Climate Change

Global mean surface air temperatures over land and oceans have increased over the last 100 years. Temperature measurements in the oceans show a continuing increase in the heat content of the oceans. Analyses based on measurements of the Earth's radiative budget suggest a small positive energy imbalance that serves to increase the global heat content of the Earth system. Observations from satellites and *in situ* measurements show a trend of significant reductions in the mass balance of most land ice masses and in Arctic sea ice. The oceans' uptake of CO_2 is having a significant effect on the chemistry of sea water. Paleoclimatic reconstructions have helped place ongoing climate change in the perspective of natural climate variability. {1.2.3; Figure 1.3}

Observations of CO_2 concentrations, globally averaged temperature and sea level rise are generally well within the range of the extent of the earlier IPCC projections. The recently observed increases in CH_4 and N_2O concentrations are smaller than those assumed in the scenarios in the previous assessments. Each IPCC assessment has used new projections of future climate change that have become more detailed as the models have become more advanced. Similarly, the scenarios used in the IPCC assessments have themselves changed over time to reflect the state of knowledge. The range of climate projections from model results provided and assessed in the first IPCC assessment in 1990 to those in the 2007 AR4 provides an opportunity to compare the projections with the actually observed changes, thereby examining the deviations of the projections from the observations over time. {1.3.1, 1.3.2, 1.3.4; Figures 1.4, 1.5, 1.6, 1.7, 1.10}

Climate change, whether driven by natural or human forcing, can lead to changes in the likelihood of the occurrence or strength of extreme weather and climate events or both. Since the AR4, the observational basis has increased substantially, so that some extremes are now examined over most land areas. Furthermore, more models with higher resolution and a greater number of regional models have been used in the simulations and projections of extremes. {1.3.3; Figure 1.9}

Treatment of Uncertainties

For AR5, the three IPCC Working Groups use two metrics to communicate the degree of certainty in key findings: (1) Confidence is a qualitative measure of the validity of a finding, based on the type, amount, quality and consistency of evidence (e.g., data, mechanistic understanding, theory, models, expert judgment) and the degree of agreement[1]; and (2) Likelihood provides a quantified measure of uncertainty in a finding expressed probabilistically (e.g., based on statistical analysis of observations or model results, or both, and expert judgement)[2]. {1.4; Figure 1.11}

Advances in Measurement and Modelling Capabilities

Over the last few decades, new observational systems, especially satellite-based systems, have increased the number of observations of the Earth's climate by orders of magnitude. Tools to analyse and process these data have been developed or enhanced to cope with this large increase in information, and more climate proxy data have been acquired to improve our knowledge of past changes in climate. Because the Earth's climate system is characterized on multiple spatial and temporal scales, new observations may reduce the uncertainties surrounding the understanding of short timescale

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[1] In this Report, the following summary terms are used to describe the available evidence: limited, medium, or robust; and for the degree of agreement: low, medium, or high. A level of confidence is expressed using five qualifiers: very low, low, medium, high, and very high, and typeset in italics, e.g., *medium confidence*. For a given evidence and agreement statement, different confidence levels can be assigned, but increasing levels of evidence and degrees of agreement are correlated with increasing confidence (see Section 1.4 and Box TS.1 for more details).

[2] In this Report, the following terms have been used to indicate the assessed likelihood of an outcome or a result: Virtually certain 99–100% probability, Very likely 90–100%, Likely 66–100%, About as likely as not 33–66%, Unlikely 0–33%, Very unlikely 0–10%, Exceptionally unlikely 0–1%. Additional terms (Extremely likely: 95–100%, More likely than not >50–100%, and Extremely unlikely 0–5%) may also be used when appropriate. Assessed likelihood is typeset in italics, e.g., *very likely* (see Section 1.4 and Box TS.1

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三、（30分）以下行政院環境保護署之公告係俗稱「蘇花改」之環境影響評估審查結論，請於瀏覽後回答下列問題：

1. 請區分比較「二階段」環境影響評估之差異。（10分）
2. 請試評論「蘇花改」之環境影響評估審查結論，何以未提及公路開發之地質安全議題？（8分）
3. 該審查結論要求「開發單位」於施工期間應針對生態影響指標生物面臨威脅時，訂定停工及復工規範，請試列舉「陸域、淡水域（以豐水期為基準）和海域生態」之指標生物各2種（共計6種）。（12分）

行政院環境保護署　公告

發文日期：中華民國99年11月15日

發文字號：環署綜字第0990103104號

附件：

主旨：公告「台9線蘇花公路山區路段改善計畫（蘇澳～東澳、南澳～和平、和中～大清水）環境影響說明書」審查結論。

依據：環境影響評估法第7條。

公告事項：「台9線蘇花公路山區路段改善計畫（蘇澳～東澳、南澳～和平、和中～大清水）環境影響說明書」審查結論。

一、本案經綜合考量環評委員、專家學者、各方意見及開發單位之答復及採取之減輕與預防措施後，本案有條件通過環境影響評估審查，亦即本案已通過環境影響評估審查，開發單位於施工及營運階段應履行下列負擔，如未切實執行，則違反環境影響評估法第17條規定，應依環境影響評估法第23條規定予以處分：

(一)東澳隧道及中仁隧道應採雙孔方式施作。

(二)施工期間應針對生態影響指標生物面臨威脅，或空氣品質及噪音臨界標準值，或水資源流失連續24小時每分鐘超過2,100公升時，訂定停工及復工規範，並依地形、地質及周邊環境條件，規劃原有水脈之維繫、湧水之再利用，或供地下水補注之措施或設施，其實施方法納入定稿，切實執行。

(三)指標生物之選定應涵蓋陸域、淡水域（以豐水期為基準）和海域生態之內容。

(四)計畫路線附近之生態景觀及地形地貌變化，應建立為期10年、每2年一次之航測資料，施工前應先完成一次航測作業。

(五)長隧道之空氣品質應建立自動監測系統，項目應至少包括一氧化碳及氮氧化物。通車2年內，應進行隧道內粒狀物、重金屬及多環芳香烴等空氣污染物之監測。

(六)施工期間開發單位應成立監督委員會，對於施工安全、湧水、空氣污染、水污染、生態及文化資產等議題進行監督。其成員應含民間團體及專家學者，相關調查及監督資料應公布於網站上供大眾參閱，以達資訊公開。

(七)本環境影響說明書定稿經本署備查後始得動工。

(八)應於開發行為施工前30日內，以書面告知目的事業主管機關及本署預定施工日期；採分段(分期)開發者，以提報各段(期)開發之第一次施工行為預定施工日期為原則。

二、本案經行政院環境保護署環境影響評估審查委員會審查後，認定開發單位未來於施工及營運階段時，確實履行所提各項污染物對環境影響預防及減輕之措施及上述所附負擔後，已無環境影響評估法第 8 條及其施行細則第 19 條所稱對環境有重大影響之虞，無須進行第二階段環境影響評估。

三、對本處分如有不服者，得自本處分公告之翌日起 30 日內，繕具訴願書逕送本署後，再由本署轉送行政院審議。

四、（20 分）請試解釋以下名詞組合（各 4 分）：

1. Mitigation and Adaptation
2. “Environmental Impact Assessment” and “Health Risk Assessment”
3. Reduction, Reuse, and Recycling
4. Renewable Energy
5. Carbon Footprint and Water Footprint